Regulation of Safety & Protection Requirements that must be Available in Residential and Office Buildings

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Section 1

1st: Definitions: The terminologies in this Regulation mean:

1. **The Law:**
   Civil Defense Law issued by the Royal Decree No. 10 and dated 10/5/1406 H and all other relevant regulations.

2. **Regulation of Inspection, forfeiture, investigation, and penalties:**
   The Regulation issued by HRH, the Minister of Interior, and the President of the Civil Defense Council to determine the procedures of inspection, forfeiture, and investigation of violations and misuses related to civil defense works and the penalties imposed on them.

3. **Civil Defense Representative:**
   The authorized person or persons by the General Directorate of Civil Defense, or one of its centers to carry out inspection, forfeiture, and investigation of violations as per the rules and procedures specified in the relevant Regulation, to ensure the safety of the building, safety equipment, and tools, and to impose the penalty stipulated.

4. **The Relevant Authority:**
   The Ministry of Interior, the General Directorate of Civil Defense, and other public authorities involved in the facility's license and activity.

5. **Specifications:**
   (a) Saudi Standards, issued by the Saudi Standards, Metrology, and Quality Organization, SASO.

(b) International Standards: in the absence of Saudi Standards, the United States of America Standards, or the Standards of the European Common Market Countries shall be considered. If the equipment or material is manufactured in other countries (other than US or EU countries), In that case the specifications must be confirmed by the manufactured countries' relevant authorities. A document must be submitted to prove the availability of all safety rules in equipment or material used in all cases.

2nd: the applicant will not be granted a license to construct one of the subject buildings to this Regulation before submitting a technical report. This report is prepared by one of the technical offices specialized in safety works and firefighting and approved by the General Directorate of Civil Defense to highlight the extent of compliance with the specifications, requirements, and rules mentioned in this Regulation. The existing buildings (residential& office buildings) at the time of the issuance of this Regulation will be allowed one year and can be extended for another year to apply the requirements and instructions included in this Regulation. The municipalities' relevant authority must consider granting a license as per this Regulation. Also, not issuing a clearance for electricity service until receiving the approval from Civil Defense to ensure the availability of safety methods and firefighting, especially in residential buildings, administrative, technical, and commercial office buildings.

3rd: The engineer who designed the building and the engineer supervising the construction are responsible for implementing this Regulation, including the technical requirements related to design, construction, and especially the specifications of the materials used. The technical office that prepared the report mentioned above is responsible for implementing other safety and firefighting requirements. The office will undertake to provide a final certificate confirming the building's compliance with the terms and conditions included in this Regulation. These offices shall be considered

responsible in solidarity with the building owner for any default or fraud in this regard.

4th: The building owner is responsible for conducting monthly inspections and periodic tests (every six months) for the building structure and safety methods and equipment and firefighting and performs all repairs and other defects immediately. Failure to do this shall be considered severe negligence.

5th: The elevator or escalator must be of the safe type and meet all safety requirements as per the Civil Defense specifications and instructions. The building owner with an elevator or an escalator shall undertake to maintain it through contracting with specialized & authorized companies in this field to carry out maintenance works.

6th: The building owner (residential and office buildings) shall assign a register called (safety and firefighting record) according to the application form prepared by Civil Defense. All pages are stamped with the seal of the relevant Civil Defense Center. All the periodic tests and inspections, and maintenance works of the building and the building's electrical and mechanical installations, plus all safety means, control, and firefighting, are recorded in this register. The building owner will keep this record if he is a resident in the building, or with the building security guard, or at the real estate office so that the register is at the disposal of civil defense representative at all times to view and write notes in it.

7th: A safety officer must be appointed In office buildings with more than (20) occupants; also several workers in the building, not less than (two for every twenty) people, must be trained in safety and ambulance tasks in one of the specialized national institutes that are approved by the General Directorate of Civil Defense or through an agreement with Civil Defense in regions where there are no such

institutes, to conduct training courses for this purpose, provided that the training requesting party bears the costs of such or its share of the course costs based on the cost of one trainee.

8th: The safety officer is committed to implementing the "regulation of tasks of the officials of safety and industrial security" issued by the Minister of interior and the President of the Civil Defense Council. The safety officer will be responsible to the relevant authorities for follow-up the work of inspection, periodic tests, and maintenance of the building and electrical and mechanical installations plus safety & firefighting devices and has to keep a safety and firefighting record.

9th: The safety officer must contact the relevant Civil Defense center and prepare a detailed plan for evacuation and firefighting during emergencies and shall be responsible for training personnel to implement this plan and clarify the actions to be taken until the arrival of Civil Defense teams.

10th: The requirements included in this Regulation are considered the minimum requirements that must be met in the buildings subject to this Regulation. The General Directorate of Civil Defense may, in conditions that require this, add some requirements that are deemed necessary to protect lives and property, provided the Director-General of Civil Defense approves these requirements.

Section 2
Safety, Prevention, and Firefighting Requirements

Scope of Application

The requirements in this Regulation shall apply to the following buildings:

1. Residential units (single-family villas).
2. Residential buildings.
3. Office buildings include administrative and commercial office buildings and self-employment.

Definitions:

1. Residential Units:
   Independent units owned or occupied by a single-family consisting of one or two floors with a maximum of three floors and are licensed as a single-family residential unit.

2. Residential Buildings:
   Residential buildings consist of several apartments for many independent families. These buildings are not over four stories in height; otherwise, the Regulation of Safety Requirement for high-rise buildings shall apply.

3. Office Buildings:
   Buildings licensed and dedicated to administrative, commercial, and self-employed purposes whether these spaces are independent or part of the building provided the building's height must be no more than four stories.

   This section contains two chapters: the first is for the general requirements for safety and prevention to be met by all buildings subject of this Regulation, and the second is for the requirements to be met for each building mentioned, which vary from type to type.

Chapter 1
General Safety Requirements to be met in all Buildings subject of this Regulation

1. **Safety of the building's structure and the protection from the external spread of fire:**
   a) The building structure and exterior walls are designed from fire-resistant materials.
   b) To achieve the principles of protection against the fire's external spread, the building's location must be at a safe distance from other buildings to reduce the spread of fire if a fire is broke out (god forbid) from or to the building.

   The distance will increase according to the increased numbers of windows and balconies, or if the fire resistance for external walls is reduced according to the technical & engineer charts approved by relevant authorities such as the Municipality and SASO.

   c) The building walls and open balconies' exterior cladding must not be less than grade "A" (non-combustible materials as per the international standard 1182/1979) for buildings with more than two stories. The building walls and open balconies' exterior cladding must not be less than grade "B" (low flammable materials as per the American Society for Testing and Materials, ASTM International specification No. 84) for one or two-story buildings.

2. Electrical installations and equipment:

All electrical and mechanical equipment and services must be designed and installed per Saudi Standards and by a specialized technical authority, considering the following:

a) All extensions and wires should be of suitable types and diameters and must be well isolated and protected against wear & tear or high current.
b) Electrical equipment and appliances (heaters, stoves, ovens, refrigerators, air conditioners, etc.) of the approved type in the Kingdom and safe to use.
c) Earth grounding for all installations and appliances.
d) Appropriate and secure power breakers must be provided against short circuits and arc circuits risks, plus installing a main breaker to cut out the entire building's electricity if necessary.
e) Heating devices with a capacity of 1,000 kilowatts are installed on a containment dyke made of non-flammable material.
f) Sufficient lighting in the building, the lamps are of a non-explosive type and placed inside glass covers, switches, plugs, and sockets are of suitable types.

3. Gas and liquid fuel installation:

a) Liquefied gas installation:

Gas tanks and connections must comply with Saudi Standards and must be installed with the Saudi Gas Company's follow-up and provided with the necessary safety methods and safety valves, including a quick shutoff valve next to gas-powered appliances. The installation of gas tanks must be outside the building as per the regulations and conditions regulating it.

The use and handling of LPG cylinders should be per the special Regulation and Civil Defense instructions issued in this regard.

b) Use of liquid fuels:

The quantity allowed for use in portable containers should not exceed 10 liters or in a suitable tank placed on containment

dyke made of non-flammable materials with a capacity of 40 liters maximum. If the quantity required for storage exceeds these numbers, it must be stored in tanks prepared for this purpose and installed outside the building according to Saudi standards and the ruling regulations.

c) Stoves, cooking ovens, and heating devices:

All these appliances driven by gas or liquid fuel must be approved and comply with Saudi Standards. It is prohibited to install any combustible equipment, shelves directly above the stoves, and the kitchens must be equipped with ventilation and appropriate air purification filters.

4. Exhaust ducts and chimneys

a) Gas and chimney ducts must be made of non-combustible materials such as bricks, cement, and steel and must comply with Saudi Standards.
b) It must be well ventilated and not connected to flammable materials.
c) The exhaust vents should be at the top of the building and away from other residential units to ensure that they are not affected by smoke and rising fumes.

5. Ventilation and air conditioning systems:

a) All ventilation and air conditioning systems must be designed, installed, and maintained as per SASO specifications to not cause any spread of smoke and hot gases from one part to another.
b) Natural and mechanical ventilation is provided to ensure the air is replenished and fumes and gases do not accumulate in the building.
c) Emergency ladders and halls should not be used as returning methods for ventilation systems.

d) The air coming from kitchens should not be connected to other places and must be pushed outside the building directly through gas ducts.

6. Elevators:

1. All elevator equipment & escalators(if any) must comply with the International Standards that are approved by SASO and must be provided with the necessary safety methods, especially the alarm bell, which provides an audible alarm sound throughout the building. Also, providing the elevator with a telephone connection connected to the supervisor of the administrative office buildings and the building's security guard, if any, in the residential buildings so that the elevator users can call for help in case the elevator malfunction.
2. Adequate mechanical ventilation must be provided in the elevator passenger cabin, and it must be equipped with a manual drop-off device from the engine compartment.
3. A specialized technical company should handle the maintenance and repair works. The company shall quickly send its technical staff as soon as it is notified of malfunctions, plus regular maintenance schedules.
4. The provision of adequate ventilation in the engine compartment and not to store any movables in it, noting that elevator shafts are clean and free of trash or waste.
5. All components and materials of the shaft walls shall be of fire-resistant materials.
6. In the event of an elevator malfunction with people inside it, the following measures must be carried out immediately:
    a) Notify the nearest Civil Defense center and the maintenance company by the administrative building's

safety officer and the security guard or the person assigned to monitor the elevator for residential buildings.

b) People confined inside the elevator are to be calmed down and assured that the technicians are on their way while trying to identify the numbers of persons and their health conditions until the arrival of Civil Defense personnel or repair technicians to the scene. The elevator is dropped down and opened by technical means, rescue the people inside and provide them with the necessary first aid and assistance.

c) Civil defense centers and the maintenance company phone numbers must be visible on signs that are fixed on all floors of the building next to elevator doors.

d) The malfunctioning elevator must be closed until the maintenance company is finished repairing the elevator.

Chapter 2
Requirements for each building subject to this Regulation

First: Safety requirements for residential units:

In addition to the conditions set in this Regulation, the following requirements must be met:

1. Manufacturing activities are not permitted in residential buildings.
2. The municipality must verify the availability of the following fire and rescue requirements and facilities before granting the license to these units :

a) The availability of a public fire hydrant in the surrounding/neighboring area to the house.

b) Fire squads should approach the house with fire hoses connected to the fire hydrant or water supply tank.
c) Fire and Rescue squads should access different windows and balconies using ladders and other equipment to carry out fire & rescue works. The municipality shall require the applicant to comply with these requirements.

3. The provision of two fire extinguishers (dry chemical powder) capacity 6 kg on each floor of the house.
4. Escape Routes:
   Each residential unit must have two exits leading out. One may be a window or balcony, access to the rescue and fire team, in which case the window or balcony must be free of barriers or obstacles that may prevent its use for this purpose.
5. In case the residential unit is located above a shop, the stairs of the building should be outside the shop's limits.

Second: Safety requirements for residential buildings:

In addition to the general requirements of this Regulation, the following requirements must be met:

1. The walls separating the apartments must be non-flammable materials so that each apartment forms an independent fire sector.
2. The resistance of the doors leading from the apartments to the hallways and stairs must be not less than 30 minutes (fire-resistant).
3. Provision of an entrance to the building or its area to allow fire and rescue teams to access with their vehicles and equipment to balconies and windows. These windows and balconies are designed as part of the escape routes and to facilitate fire and rescue works.

4. Fire hose reels must be installed on each floor of a two-story building or more, near the escape stair and within a distance of no more than (25) meters from the farthest point on the floor and connected to a water source with appropriate pressure.
5. Provide a water source in a suitable place for fire fighting purposes. The distance between the building and the nearest fire hydrant or a similar water supply should be no more than (100) meters, and the roads must be accessible for fire vehicles to reach the water source.
6. Each floor must be equipped with a number of manual fire extinguishers, one fire extinguisher (dry chemical powder 12 kg) for every two apartments, and a minimum of two fire extinguishers for each floor.

7. Escape Routes:

a) The provision of two alternative escape routes for each apartment, one may be a window or an open balcony, both can be accessed by fire and rescue teams. The window or balcony must be barrier-free and suitable for rescue and fire purposes.
b) At least one escape route must be provided from each apartment, and this will allow the occupants to move to a safe place outside the building.

c) In case of corridors, halls, and stairs leading from the apartment entrance to the outside are considered an escape route, then the distance from the entrance door to a protected staircase and a balcony leading to a ladder should not exceed ten meters.
d) Exposed/open surfaces/roofs in escape routes must be fire-resistant and smoke-free, free of obstacles, and well ventilated.

e) If there are apartments above commercial or administrative buildings, the elevators serving these apartments must not connect to other building parts.
f) A single escape ladder may be installed to serve two joint buildings if it can be installed in a proper technical matter.

Third: Requirements for office and commercial buildings:

In addition to the conditions of this Regulation, the following requirements must be met:

1. The provision of suitable roads for fire and rescue vehicles to ensure easy access to the building, balconies, windows, and water source locations to carry out fire and rescue works if necessary.
2. Each floor must act as a fire sector so that its walls and floors are fire resistant for an hour and the doors are fire resistant for half an hour at least, and each ladder should form an independent fire sector and must be protected.
3. The building must be equipped with a manual alarm system if the numbers of workers inside the building or visitors are more than 50.
4. Buildings with more than 250 occupants (working and visitors) must be equipped with an automatic fire alarm system using heat & smoke detectors.
5. Buildings with more than 500 occupants (working and visitors) must be equipped with an automatic fire system using water sprinklers in addition to the automated alarm system.
6. Automatic fire & alarm systems must comply with Saudi Standards issued by SASO. The installation and maintenance must be carried out under authorized bodies' supervision related to these works.
7. Escape routes:

The provision of two escape routes from each office, office area/zone or floor, one of which may be an open, barrier-free balcony, to enable easy access of fire & rescue equipment.

Internal escape routes must lead to exits, to a safe area outside the building.

The number of escape routes and exits in the building must be determined as per scientific-technical standards and Saudi Standards, which ensures that the building is evacuated easily and swiftly during emergencies within three minutes, and the distance that the person travels to reach the nearest escape route must not exceed fifteen meters.

The number of exits can be determined according to the recognized internationally considerations and rates, as follows:

1. The distance required for one person to pass should not be less than 21 inches.
2. The emergency exit should not be less than two units (42 inches) and a minimum of 100 cm.
3. The flow rate of people from the exit which means the number of people who can exit within one minute, 25 persons.
4. The time required to evacuate:

Varies by building according to the following:

a) Type 1 buildings:

Buildings are all fire-resistant and should be evacuated within three minutes.

b) Type 2 buildings:

These buildings are fire-resistant materials, including easily combustible materials that should be evacuated within two and a half minutes.

c) Type 3 buildings:

They are made of easily combustible materials and should be evacuated within two minutes.

5. The expansion of the required exit units is calculated according to the following equation:

$$\text{Units} = \frac{\text{Number of occupants (building capacity)}}{\text{flow rate of people from the exit (25)} \times \text{time required to evacuate}}$$

a) To determine the number of emergency doors required, the number of units needed should be divided into four and then add one to the total. In general, the number of emergency doors required for a building must be not less than two doors.

b) The exit width must be not less than one meter, and the escape route must be not less than (120) cm.

c) Escape/emergency stairs must be made of non-flammable materials such as cement, marble, and so on. The barriers and walls are also non-flammable materials to achieve proper protection. External/outdoor stairs can be used in buildings that are not more than three stories in height, and the number of occupants is less than 50 people. These stairs must be installed on a fireproof wall.

d) Escape routes must be protected/guarded against smoke by installing smoke-barrier doors as per SASO.

e) According to SASO requirements and relevant authorities, natural and mechanical ventilation must be provided for escape routes.

f) Elevator halls on all floors above the ground floor must be isolated from the corridors using smoke-barrier doors and fire-resistant separators.

g) Escape routes must be equipped with emergency lighting. Power for these lights should come from a backup power source such as batteries to illuminate these routes and exit & guidance signs during a main power outage.

h) The necessary guide signs for escape routes, exits, and all safety requirements must be provided and installed in visible places throughout the building.

8. The building must be equipped with the following firefighting means and equipment:

a) Movable fire hose reels:

Mounted on all floors, preferably near the escape stairs, and must be available within no more than 25 meters from any point on the floor. The design and installation of these reels are according to SASO standards and are connected to a water source and ready to use. The reels must be equipped with suitable water monitors and installed on walls inside glass-fronted cabinets. An instruction panel is placed next to each reel, highlighting their use and operation instructions.

b) Firewater sources:

A water supply source must be available for firefighting purposes in the building, whereas the distance between any point in the building and the nearest fire hydrant or a similar water supply is not more than 100 meters.

c) Manual fire extinguishers:

Manual fire extinguishers must be provided on all floors of the building, and a dry chemical powder extinguisher (12 kg) is allocated per 100 M^2 of space. The extinguishers are distributed by corridors, passageways, close to office doors, and the allocation of Co^2 extinguishers for electrical installations and halon extinguishers for computer rooms and microdevices. The coordination with the relevant Civil Defense Center to determine the numbers and types of fire extinguishers should be considered.

The extinguishers are placed in clearly visible places so that they are easy to reach and use when needed, with staff trained on how to use these extinguishers efficiently.

The extinguishers should be maintained to be ready to use and checked periodically according to the manufacturer's instructions. A specialized technical authority must carry out this procedure. The inspection date and testing on each extinguisher must be visible on each extinguisher.