UNITED ARAB EMIRATES

THE CABINET

CABINET RESOLUTION NO. (13) OF 2009

APPROVING THE GENERAL STANDARDS MANUAL FOR GROUP LABOR ACCOMMODATION AND RELATED SERVICES

The Cabinet,

- Upon consideration of the Constitution,
- Federal Law No. (1) of 1972 concerning the Jurisdictions of Ministries and the
- Powers of Ministers, and the laws amending thereof,
- Federal Law No. (8) of 1980 Regulating Labor Relations, and the laws amending thereof,
- Ministerial Council for Services Resolution No. (214/4) of 2008 and
- Based upon the proposal of the Minister of Labor and the approval of the Cabinet,

Resolved:

ARTICLE (1)

The General Standards Manual for Group Labor Accommodation and Related Services, attached hereto, is hereby approved and shall applied to group labor accommodations with five hundred or more laborers.

ARTICLE (2)

As of 1/9/2009, the authorities concerned with granting group labor accommodation licenses may grant licenses for this type of accommodation only in accordance herewith.

ARTICLE (3)

Any and all establishments operating in the UAE and having a group labor accommodation for five hundred or more laborers shall, within five years from 1/9/2009, ensure that the conditions at the accommodation are in accordance with Article (1) hereof.

ARTICLE (4)

The Minister of Labor shall issue the necessary decisions concerning the following:

- Laying down general criteria for group accommodation for less than five hundred laborers;

- Implementing the provisions hereof, provided that the respective decisions issued by the Minister of Labor shall include transitional provisions and the required rules for execution, incentives and administrative penalties.

ARTICLE (5)

The provisions of this Resolution, including the decisions issued by the Minister of Labor under Article four hereof, shall apply to all UAE zones including the free zones.

ARTICLE (6)

This Resolution shall be published in the Official Gazette and shall enter into force as of the date of its issuance, subject to the dates set out in Articles (2) and (3) hereof.

Mohammad Bin Rashed Al-Maktoum

Prime Minister

Issued by Us in Abu Dhabi:

On: 20 Rabie al-Awwal 1430 H, corresponding to 17/3/2009.

GENERAL STANDARDS MANUAL FOR

GROUP LABOR ACCOMMODATION AND RELATED SERVICES

IN THE UNITED ARAB EMIRATES

APPROVED BY CABINET RESOLUTION NO. (13) OF 2009

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Introduction to the Manual

The requirements set out in this Manual are the basic standard for the planning and building of new labor accommodation compounds, areas or cities and related services. These requirements are addressed to consulting engineers and competent local authorities. Before issuing any work drawings and detailed specifications for the housing compounds as part of the tendering process, the design review process should be completed to verify compliance with these specifications before submitting the design to the concerned authority for approval.

For the purposes of these standards, the following definitions shall apply regarding labor accommodation:

1. **Group Accommodation:** any residential building or set of residential buildings intended for labor accommodation and houses more than 500 persons;
2. **Residential Unit:** any building intended for labor accommodation and houses $1{,}000$ persons as a maximum;
3. **Residential Compound:** a site that consists of a number of residential units and houses $1{,}000 - 5{,}000$ persons and is surrounded by 2.2 m high iron fencing;
4. **Residential Area/Residential Quarter:** a site that consists of a number of residential compounds and houses $35{,}000$ persons as a maximum;
5. **Labor City:** a site that consists of a number of residential areas separated by main roads and houses $240{,}000$ persons as a maximum.

Note: The specifications and requirements of these standards shall apply to all residential units and compounds. The specifications and requirements

marked with an asterisk (*) are additions that shall apply to residential compounds only.

1. Planning Standards

1.1 Site Standards

When choosing sites for labor accommodation, the following standards should be observed:

1. The site should be at a distance of at least 5km from family residences;
2. The site should be far from important and tourist roads / arteries;
3. The site should be far from the existing investment compounds, whether those with a tourist or a commercial nature;
4. The site should be far from environmental pollution sources (should be free from garbage and far from animal farms) and from storm water and flood drainage systems as per the standards approved by the competent local authorities;
5. The site should preferably be close to industrial areas or areas presenting job opportunities with a buffer zone in between;
6. The site should preferably be close to an active road network with several entrances and exits in different directions to facilitate entry and exit of buses particularly at peak hours;
7. The site should be connected to a sanitary drainage system and a potable water system.

1.2 Site Coverage

1.2.1 **Land Construction Percentage**: The percentage of constructions divided by the total land area where the constructions are set up.

The following table shows permitted percentages on the site:

Total constructions	60 – 65%
Roads, pedestrian paths, parking spaces, recreational spaces, yards, planted areas and paved roads between the buildings	35-40%

1.2.2 The maximum building height should comply with the standards approved by the competent local authorities.

1.2.3 The space in between the residential units should comply with the building conditions and specifications determined by the local department subject to a minimum distance of 5 m.

2. Unit Design Requirements

2.1 General Design Requirements

2.1.1 The general design requirements stated below are applicable to all the units designed as part of the site development process. The additional requirements applicable to the residential compounds have been detailed under these standards, so that all the designs shall observe the municipal bylaws and to the laws and standards of the competent authority.

2.1.2 All the units should be designed according to the engineering standards and specifications imposed by the competent local authorities.

2.1.3 The building should comply with all the sanitary and environmental conditions and safety requirements to preserve the health and safety of its residents and protect its internal and surrounding environment. This includes building materials, drinking water and sanitary drainage systems, air conditioning systems, elevators, emergency exits, firefighting systems, internal air quality and common service utilities, all according to the standards of the competent local authorities and international specifications.

2.1.4 Periodical maintenance should be performed to ensure the fulfillment of all such requirements throughout the occupation period thereof.

2.2 Materials

2.2.1 Units shall be constructed of concrete or cement blocks walls. Unit flooring must be made of concrete as well. The construction methods used for all buildings should be complaint with the regulations, legislation and standards provided for under the laws adopted by the competent local authorities.

2.2.2 All building materials used must be safe to the environment and public health. They may not be flammable and should comply with the standards of the Civil Defense Directorate.

2.2.3 Doors should be fireproof according to the standards of the Civil Defense Directorate.

2.2.4 In case of absence of regulations / legislations / competent local laws, recognized international standards shall be applicable.

2.3 Outdoor Requirements (*)

2.3.1 An adequate area should be provided for to ensure safe pedestrian movement.

2.3.2 An adequate area should be provided for to allow vehicle movement and parking, taking into consideration the following:

- Site entrances and exits must be controlled;
- Emergency cars must be enabled to access to all buildings;
- Food delivery, provision and storage;
- Garbage management (storage, collection and transportation);
- Bus stops and car parking;
- Fire prevention and alarm systems;
- Emergency exits and assembly points;
- Outdoor lighting.

2.3.3 Safe pedestrian passages should be indicated clearly by providing instruction signs. Adequate waiting places should be provided at bus stations and car stops for workers pickup and assembly after drop- off.

2.4 Ventilation and Air Conditioning

2.4.1 All the rooms, kitchens, mess halls, corridors, offices and halls must be provided with ventilation and central air

conditioning systems as per the standards and conditions adopted by the competent local authorities. In case there is no central air conditioning system, the rooms must be supplied with individual air conditioning. Condensation discharge pipes should be installed inside the vertical service poles for water drainage.

2.4.2 Window area should be at least 10% of the room floor area. 50% of the windows should be openable.

2.4.3 A ventilation system should be installed in bathrooms to discharge air outside the building and replace it with external air using the proper methods.

2.4.4 An aluminum window with curved sides for ventilation shall be fixed at the bottom part of the door of every room or bathroom, to provide ventilation and create an air current with the air coming from the adjacent area.

2.4.5 Air quality inside the building should be preserved. The building should be provided with outdoor air according to the averages stated in the following table:

Category of Occupation	**Liters/seconds/persons**	**Category of Occupation**	**Liters/seconds/persons**
Mess Halls	5.0	Laundry rooms	5
Kitchens	25	Bathrooms	25
Bedrooms	5.0	Toilets	25

Lobby and corridors	5.0	Security office	5
Offices	5.0	Prayer room	5
TV & entertainment rooms	7.5	First aid room	5

2.4.6 Adequate ventilation systems should be available in bathrooms, storerooms, copy rooms, computer rooms, kitchens, toilets, furnaces, changing/bathing rooms, swimming pools and other areas that contain pollution sources. Pressure in these areas should be lower than the pressure in adjacent internal areas and higher than the pressure in external areas. Ventilation systems should directly lead outside the building and should be installed in a way to prevent the return of pollutants into the building, at a distance of at least 25 feet from air inlets.

2.4.7 The air in kitchens, bathrooms and toilets should be renewed at the minimum averages stated in the following table:

Place	**Ventilation Average (liter/second/unit)**	**Ventilation Average (liter/second/m^2)**

Kitchens		3.5
Bathrooms	35/25	
Toilets	35/25	

2.4.8 A control system should be available to control the temperature, humidity and air speed and provide a comfortable ambience, fulfill the requirements and reduce microbes and pollutants in all air-conditioned places.

2.4.9 Relative humidity average should be between 30% and 60% in all airconditioned areas.

2.5 Lighting

2.5.1 All lighting units fixed in occupied areas should provide the minimum lighting levels shown in the following table (as per safety considerations).

Location	Area / Activity	Minimum / Average (Lux)
General	Passages, corridors, lobby, stairs, entrance, reception areas … etc.	100
Residential units	Bedrooms	100
	Kitchens	150
	Cool storage	100
	General workplaces	100
	Entertainment places	150
	Ablution places	100

	Shops, storerooms, warehouses	100
	First aid room	300
Laundry	Receiving, sorting, washing, drying	150
	Dry cleaning, bulk automatic work	150
	Ironing, inspection, repair	200

2.5.2 All the bulbs used should be low-consumption light bulbs. Light fittings installed into false ceilings should be used.

2.5.3 Outdoor lighting should allow pedestrians to distinguish the borders of the sidewalks, direction changes, crossroads and any obstacles or potential risks.

- Street alleys, changes in street gradation and any other potentially dangerous locations should have more lighting than passages.
- Lighting bases/posts should be placed in a way so as not to obstruct pedestrian movement.

2.6 Firefighting Equipment and Emergency Exits

2.6.1 Firefighting equipment and emergency exits should comply with civil defense standards (**NFPA 101**).

2.6.2 Emergency roads and passages should be provided with chargeable lighting devices to be operated in case of power outage.

3. Design of Residential Units

Residential units should be designed, built and fitted out in such a way as to ensure that occupants have an acceptable level of comfort and safety in a clean and healthy environment.

3.1 General Requirements

3.1.1 Accommodation management, security office, workers equipment room, kitchens, cafeterias, prayer room, first aid room and any other services should be located on the ground floor.

3.1.2 If any extra space is available after providing all the above services, this space may be used for constructing bedrooms for the workers on the ground floor.

3.1.3 The drawings submitted for licensing should indicate the general location, horizontal projections, façades, sections, constructional and electric plans, civil defense, sanitary drainage, thermal insulation, roads and all the details of workshops, doors, windows and installations as well as whatever is required as per the engineering standards approved by the competent local authority.

3.2 Bedrooms

3.2.1 Each worker shall have a space of not less than 3 m^2.

3.2.2 The number of workers allowed per bedroom shall be 8 to 10 workers subject to observing the area specified for each worker.

3.2.3 Bedroom ceiling should be not less than 7 feet high.

3.2.4 Each person should be provided with his own sleeping area even in case of shifts.

3.2.5 Each person should be provided with a bed, side table and a 2 m high wardrobe with a lock.

3.2.6 The space between the beds should be not less than 36 inches from both sides and from the front and back sides. A bed height should be not less than 12 inches from the ground. In case of bunk beds, the distance between the beds should be not less than 48 inches from both sides and the rear side, provided that the distance between the upper and the bottom bed shall be not less than 27 inches. Triple bunk beds are not permitted.

3.2.7 Shoe racks should be placed at the entrance of every room for the workers to place their shoes before going into the sleeping area.

3.2.8 No cooking stoves or washing machines may be used inside the bedrooms.

3.3 Sanitary Facilities (Bathrooms)

3.3.1 Access to sanitary facilities should be easy without the need to pass through bedrooms. No private bathroom may be located at a distance less than 100 feet from any bedroom, mess hall or kitchen.

3.3.2 In case of common bathrooms, one toilet should be available for every 8 people, and any common bathroom should have at least 2 toilets.

3.3.3 One urinal should be provided for every 25 persons. If there is not enough water pressure, the urinals should be supplied with enough water to be used after finishing.

3.3.4 One shower and one washbasin should be provided for every 8 people.

3.3.5 Cold and hot water should be provided.

3.3.6 The washbasins should have mixers to control the temperature of the water used.

3.3.7 The toilet and bathroom designs should include fixtures to hang clothes and towels and place the soap as well as mirrors and cabinets. Clothes and towel hangers made of solid materials such as stainless steel should be available in sufficient quantities for the number of intended users.

3.3.8 Window area should be at least 10% of the bathroom floor area. At least 50% of the windows should be opened to the outside.

3.3.9 No toilet, bathroom chemical substances or urinals may be placed in any room that is used for other than toilet purposes.

3.3.10 Sufficient quantities of toilet paper should be available in toilets.

3.3.11 Bathrooms and toilets should enjoy sanitary conditions and should be cleaned at least once a day. Detergents should be used in toilets.

3.4 Kitchens

3.4.1 Each residential unit should have a kitchen that is compliant with the public health standards provided for by the concerned authority.

3.4.2 The kitchen should be managed by a licensed food service company or by food staff appointed by the accommodation facility management.

3.4.3 The kitchen should be provided with washable tables.

3.4.4 The kitchen should be equipped with a proper drainage system and a ventilation outlet and/or a funnel, and the funnel should be at least 2 m higher than the closest building to the unit.

3.4.5 Gas cylinders should be placed outside the building and shaded from sunlight.

3.4.6 The kitchen should be equipped with pest control means.

3.4.7 The kitchen should be kept clean.

3.5 Mess Hall

3.5.1 The mess hall should be close to the kitchen and should be supplied with enough tables and chairs in addition to a water cooler and washbasin (with cold and hot water, liquid soap and tissues).

3.5.2 Each person should have an area of his own of at least 1.4 m^2 in the mess hall (and in the TV and rest halls), which should accommodate at least one third of the total number of residents in the unit.

3.5.3 A schedule specifying mealtimes should be placed at the entrance of the mess hall.

3.5.4 The mess hall should be kept clean at all times.

3.6 Services

3.7 Rest halls

3.7.1 Workers should have a rest hall with comfortable seats and a TV (within the mess hall).

3.8 Medical Services

3.8.1 Each residential unit should have one first aid room to be supplied with enough furniture, materials and a drug cabinet, as per Table 3 under Article 4 of Minister of Labor Decision No. 32 of 1982 determining the preventive methods and measures for protecting workers from the risks at work.

3.8.2 Each residential compound should have a medical clinic that can provide health services to all the residents and deal with the cases that require medical care except for cases that require hospitalization. (*)

3.8.3 An isolation room for patients should be provided and equipped with all the necessary furniture and equipment.

3.8.4 The clinic should be ready for operation 24/7 including the weekends, official holidays and religious and national holidays. (*)

3.8.5 The clinic should have the following specifications:

- Easy access (it should be provided with an inclined staircase if necessary).
- A waiting area with sufficient space for patients.
- A number of rooms / offices with sufficient spaces for several uses:
  - Consulting and treatment room;
  - Convalescence room;
  - Medical records room;
  - Equipment, bandages and drugs room.

- An adequate number of employees (including an on-duty physician and a nurse).
- Bathrooms and washbasins with hot and cold water for patients and visitors.
- An onsite ambulance for transporting patients to offsite hospitals.

3.9 Laundry

3.9.1 Laundry services may be outsourced.

3.9.2 If laundry services are not outsourced, the accommodation management should:

- Provide laundry services according to an announced schedule and appoint a person to be in charge of these services or
- Provide the unit with common laundry facilities.

3.9.3 Common laundry facilities should be on the ground floor of the residential unit.

3.9.4 Common laundry facilities should be designed according to the technical specifications approved by the competent local authority.

3.9.5 Common laundry facilities should be provided with all the required services such as hot and cold-water connections, ventilation and air conditioning, drainage system and sufficient lighting.

3.10 Other Services

3.10.1 Courts should be provided to allow workers to exercise different sports in their free time. (*)

3.10.2 Each residential unit should have a barber salon and a grocery store to be used only by the residents and not by the public. In case a grocery store exists, it may not sell foods that go bad quickly or need to be cooked before consumption. Food may not be prepared, wrapped or packed inside the grocery store.

3.10.3 The compound should be provided with an ATM to enable workers to withdraw and transfer money. (*)

3.10.4 Each residential unit shall have a prayer room.

4. Public Health Requirements

4.1 Waste Disposal

4.1.1 Waste shall be disposed of using a mechanism that observes environmental and health conditions established by the concerned authority.

4.1.2 Sealed and washable trash containers should be provided in sufficient quantities.

4.1.3 At least one trash container should be provided and placed on a wooden, metal or concrete stand, and the trash container and the surrounding area shall be kept clean at all times.

4.1.4 Containers should be emptied and cleaned daily.

4.1.5 Residential units should be cleaned daily.

4.2 Public Health Hazards

4.2.1 All necessary and effective measures should be taken to prevent public health hazards such as insects and rodents from existing or multiplying.

4.2.2 A company specialized in controlling public health hazards and licensed by the competent local authority should be contracted to carry out extermination activities as per an approved program. Records and reports of completed extermination works should be kept.

5. Public Health Management

5.1. Accommodation Management Office

5.1.1. The accommodation manager shall manage all the facilities in a safe and effective manner as per the standards and procedures in force, including the maintenance of all facilities.

5.1.2. The accommodation manager should keep a register of the residents in an updated database.

5.1.3. The accommodation manager shall be responsible for:

- Appointing employees / workers inside residential units;
- Providing proper training for the employees / workers;
- Providing all the services and requirements under these standards;
- Coordinating the inspection of all units;
- Controlling and managing the planned occupation percentage against actual occupation (population density);

- Issuing instructions and following up:
  - Onsite maintenance and cleaning activities;
  - Food catering;
  - Unit management;
- Ensuring observance of housing instructions by all employees, contractors and occupants;
- Managing inspection activities and relevant correctional actions;
- Managing the housing budget;
- Organizing and holding periodic training sessions on evacuation in case of emergency and supervising the introductory training program.

5.2. Health, Safety and Security

5.2.1. Each occupant should, within one week from the commencement of his occupation of a residential unit, join an awareness program that covers the following:

- Instructions of the unit management / residential compound;
- House rules;
- Proper use of services and facilities;
- Personal hygiene;
- Waste disposal;
- Preventing pollution;
- Pest control;
- Fire prevention and proper use of firefighting equipment;

- Responsibilities during emergency cases.

5.2.2. Copies of house rules signed by the accommodation manager should be printed and placed in a visible manner on every floor, provided that the rules are in the languages understood by the residents of the units.

5.2.3. The house rules shall at least include the following points:

- Cleanliness;
- Clear prohibitions (smoking, cooking);
- Storage rule;
- Trash;
- Loud music;
- Tampering with the building equipment;
- Trash disposal;
- Water preservation;
- Visitors;
- Any other matter deemed necessary by the manager.

5.2.4. Employees, workers and visitors are not permitted to use tobacco products whether for smoking or for other purposes inside the residential units, at 20 feet from any entrance or at 20 feet from fresh air inlets. Using tobacco products is permitted outdoors or in designated smoking places that are completely isolated from non-smoking areas by walls from ground to ceiling.

5.2.5. An electricity and water control option from outside the residential compound should be available. (*)

5.2.6. The residential compound should be provided with surveillance cameras to monitor every section, in addition to the public announcement system. (*)

6. Utility Requirements

6.1 Water Supply

6.1.1 Observance of the technical and health conditions related to the water system installations and reservoirs is necessary, where such installations and reservoirs should comply with the specifications and standards of the competent authorities.

6.1.2 The following should be available in residential units: underground reservoirs and adjacent water pumps to supply drinking water to the entire site as well as underground reservoirs and water pumps to feed the fire extinguishing systems, outdoor hoses, indoor hoses and fire hose reel cabinets in each residential unit.

6.1.3 Water systems should be installed, operated and maintained in a way to prevent the growth of bacteria and other air-carried microbes, as per local laws and regulations.

6.2 Drinking Water

6.2.1 The design and installation of the pipes, valves, fittings and pressure reducing valves required for the distribution of hot and cold water should comply with the regulations and standards of the concerned electricity and water authority.

6.2.2 The water supply average to the residential unit should be based on the total number of workers that the unit can accommodate, subject to an average of 35 gallons for each person per day and 2.5 times the consumption average per hour at peak times.

6.2.3 All bathrooms, showers, washbasins and kitchens should be supplied with hot and cold water.

6.2.4 Water systems should be designed and supplied with water conservation methods.

6.2.5 Water service poles should be separated from electric service poles.

6.3 Drinking Water Reservoirs

6.3.1 A water supply service should be available around the clock. The water should be stored in a central underground reservoir, which must be simultaneously supplied with the required quantities to compensate for consumed water.

6.3.2 The reservoir shall be filled at least to the level of the maximum water consumption of the residential unit.

6.3.3 A pipe shall be installed to discharge overflow water in the reservoir.

6.4 Water Pumps

6.4.1 Water should be distributed to all occupied buildings through an underground pipeline system. Water should be pumped by two electric pumps for drinking water, each with a capacity equaling the total consumption average, to

ensure supplying sufficient quantities of hot and cold water at peak times in each building.

6.4.2 A reserve diesel-driven pump for drinking water with a capacity equaling that of the main pump should be installed to operate simultaneously with the two main electric pumps. The reserve pump should operate automatically in case of interruption of the electric generator that feeds the electric drinking water pumps.

6.4.3 Sufficient quantities of diesel fuel should be provided to operate the reserve pump at full capacity and without interruption for 24 hours.

6.4.4 Each of the electric and diesel-driven water pumps should have a reserve capacity of 135% compared to the normal pumping average of approximately 85% of the generated capacity without overloading the pump or the gear.

6.5 Cold Water Supply

6.5.1 Each residential unit should be supplied with cold water at an average of 35 liters/minute per person every 24 hours, taking into account the increase in demand for drinking water at peak times, especially in the early morning and evening.

6.5.2 Outdoor water reservoirs should be covered with sunshades to guarantee cold water in the summer.

6.5.3 Water coolers should be available in each residential unit according to the number of workers per unit and/or the number of persons expected to use the unit.

6.5.4 The units should have separate cold-water feeders with valves.

6.6 Hot Water Supply

6.6.1 Each unit should be supplied with hot water at an average of 20 liters/person for every 24 hours, taking into consideration the increase in demand at peak hours, especially in the early morning and evening.

6.6.2 Hot water storage of a capacity of 1000 liters should be provided for kitchen use and 600 liters for ablution.

Note: It is recommended to use solar water systems for power conservation; electric heaters may also be used. Modern technology also allows the installation of a double heating system that operates on both solar and electric energy, where the heater starts by heating the solar plates during the daytime and is electrically operated at other times.

6.7 Firefighting Water Reservoirs

6.7.1 The total net capacity of the firefighting water reservoir is calculated according to the requirements of the water hose system, in addition to the requirements of automatic water sprinkles, as shown in the following schedule:

Water Hoses	2000 liter/minute x 240 minutes	480 m^3
Sprinklers	3000 liter/minute x 120 minutes	360 m^3
Total Capacity	840 m^3	

6.7.2 An underground firefighting water reservoir shall be built and supplied with a clean water pump of a capacity up to 1000 liter/minute.

6.7.3 The concrete firefighting water reservoir shall be built as per international water storage standards. The reservoir shall be supplied with galvanized joints made of mild steel to enable the installation of a withdrawal pump as well as an overflow water pipe.

6.7.4 An overflow water connection, incoming water connection and withdrawal pump connection should be installed.

6.7.5 An outflow prevention device should be installed on the withdrawal tube inside a drain of 1m x 2m x 1.5 m deep at the bottom of the reservoir.

6.8 Firefighting Water Supply

6.8.1 Sufficient water quantities should be supplied for extinguishing fires and feeding water hoses outside the buildings, in addition to all the fire hoses and the winded fire hoses inside the buildings.

6.8.2 Store and warehouse areas should be supplied with automatic sprinkler systems. The quantity of water required by the sprinkler systems is based on the water hose system demand.

6.8.3 Outdoor and indoor hose systems installed in all the buildings should be supplied with an average of 2000 liters/minute for a period of 4 hours (240 minutes). Sufficient water quantities shall be provided for the winded 30m long fire hoses fixed inside the buildings.

6.8.4 Fire-extinguishing water overflow can be added to the sprinkler systems at an average of 3000 liters/minute for a period of two hours (120 minutes). The engineer should verify the sprinklers' ultimate need for water before finishing his work on the fire pump.

6.8.5 Fire pumps should have a reserve capacity of 135% of the flow compared to approximately 85% of the generated capacity without overcharging the pump or the gear.

6.9 Fire Water Pumps

6.9.1 Fire water pumps should comply with civil defense standards.

6.9.2 Two double fire pumps shall be installed, one powered by and the other by electricity, in addition to a reserve pump installed in the underground fire pump station, provided that these pumps have all the operation and control accessories and devices as per international fire prevention standards for fixed pump installation.

6.10 The double pumps, reserve pump tubes, valves and backflow prevention valves shall be installed near the firefighting water reservoir. A water flow detector with 2% accuracy should be installed to test the flow process of the individual fire pumps.

6.11 Firefighting Water System

6.11.1 A main firefighting system shall be installed around the site to supply firefighting water through an underground pipeline network. The firefighting water pipes shall supply the outdoor and indoor hoses with the required water amount in addition to the water supply required by the

sprinkler systems installed in the stores … etc., when necessary.

6.11.2 The firefighting system should have sufficient diameter to allow the transportation of water at the required average to the farthest point of the pipeline system from both sides. These pipes should be installed by a contractor specialized in fire prevention.

6.11.3 The firefighting pipeline system and isolation valve system should be installed as per international inspection, testing and maintenance standards for firefighting pipes.

6.11.4 All pipes, fittings and isolation valves shall be installed and tested based on a pressure of 16 bars (1600 kPa).

6.11.5 Pipes and fittings shall be installed using a black steel tube with welded fittings and fittings screwed on small pipes of less than 80 mm diameter. All pipes shall be corrosion resistant. Hidden outdoor pipe shall be a 16 UPVC pipe instead of a steel pipe.

6.11.6 All section isolation valves, withdrawal pumps and distribution pumps shall have opening/closing indicators. These indicators shall turn in clockwise motion upon closing.

6.11.7 All joints shall be fixed to fire nozzles dedicated to firefighters, and a closing valve and a backflow prevention valve shall be fixed to the lower side of the nozzles. These nozzles should be accessible from the ground floor by the service passage to allow easy connection of the pumps

and using them to support the pumping of water towards the building on fire.

6.11.8 The hose valve shall be installed to the underground fire pipeline system, at a maximum distance of 15m from the nozzle joints used by the firefighters.

6.12 Electricity Supply

6.12.1 All electricity supply and wiring systems should be designed and installed according to the requirements set out by the Electricity and Water Authority.

6.12.2 Submission and approval regulations of the Electricity and Water Authority shall be strictly observed.

6.12.3 Power substations shall be installed and supplied with power, step-down transformers and a switchboard etc.

6.12.4 One electrical room shall be constructed on the ground floor per occupied unit and shall be completely equipped with a switchboard and an engine control device.

6.12.5 Devices and power distribution panels shall be distributed among the floors, and separate isolating switches shall be installed for each light and electric circuit across the area.

6.12.6 Separate electrical isolation devices shall be installed for ventilation and air conditioning systems. These devices shall be installed in control rooms, kitchens and other service areas.

6.12.7 Separate electrical isolation devices shall be installed for every heating device installed inside the heaters.

6.12.8 Main air conditioning / cooling units shall be supplied with three-phase electric power systems that are disconnected individually in the relevant unit location.

6.12.9 Electrical outlets shall be installed in the wall (5 AMP sockets) as follows:

- In all bedrooms:
  - A socket near every bed for personal use;
  - In each room for electrical appliances;
- Sockets shall be installed to the wall of each main corridor, with a 15 m distance between sockets, for the purpose of plugging in floor cleaning devices.
- In all occupied rooms such as the offices, warehouses, security offices, control rooms, workshops, stores… to plug in cleaning devices, small electric tools and electric appliances.
- In all common areas to plug in the required number of washing machines, refrigerators, in-wall air conditioners, vending machines and water coolers.

6.13 Gas Supply

6.13.1 Gas shall be supplied in compliance with civil defense requirements.

6.14 Sanitary Drainage

6.14.1 All occupied residential units shall be supplied with a sanitary drainage system that is compliant with the

regulations of the local municipality and the laws and standards of the competent authority.

6.15 Telecommunication Services

6.15.1 Safe landline phones and cable distribution cabinets shall be placed on the ground floor of each residential unit to be used by the telecommunications authority.

6.15.2 Public phones shall be installed near each residential unit, mess halls and other common facilities. They shall be installed in weather-tolerant booths covered with sunshades. The telecommunications authority shall determine the proper locations and number of public phones.

7. Firefighting Systems

All fire prevention, detection and alarm systems, including the monitors, electric installations and sprinkler systems, should be designed and installed as per Civil Defense standards.

7.1 Alarm Systems

7.1.1 Each floor of a residential unit, whose area is more than 1000 m^2 should be divided into fire sectors.

7.1.2 Each unit should be provided with a fully systematic alarm system controlled from within the unit by means of an analog fire alarm panel. Alarm panels shall be installed in secure places such as the security office on the ground floor and / or the kitchen.

7.1.3 Each fire alarm panel should be connected to a printer that will print out a summary of the incident that occurred.

This printer shall be fixed on the front side of the panel, in addition to a plasma screen to determine the devices that have been activated in each area.

7.1.4 All fire alarm panels shall be supplied with 24 V reserve batteries, provided that these batteries are continuously charged by means of an internal charge unit, allowing these batteries to operate the panel and the fire detectors in power outages for a minimum period of 12 hours.

7.1.5 Fire monitors shall be installed on all fire detectors to connect the cables to each floor of the concerned unit. These monitors assist in instant alarm reception in case the fire detector fails, or its cable is cut off. They also replace any defected area in the fire detector cable system.

7.1.6 All early detection systems shall be installed as per international standards for fire detection and alarm systems designed for buildings.

7.1.7 All substations containing the pipes, pump stations and other occupied facilities shall be provided with an early fire detection system similar to the aforementioned one.

7.1.8 The substation containing the pipes and the switchboard rooms in residential units must have a firefighting system that uses a clean gas and is activated automatically by the early detection system.

7.1.9 The gas extinguishing system shall be installed as per international standards on gas extinguishing systems.

7.1.10 All rooms where gas extinguishing systems are installed shall be insulated in a way to ensure the preservation of the extinguishing gas in the secure area at the proper concentration for at least 10 minutes.

7.1.11 If sprinkler systems are installed in the building, separate water connections should be installed for every set of control valves of the sprinkler valves.

7.1.12 Main passages should be equipped with water spray nozzles.

7.2 Public Announcement and Fire Alarm System

7.2.1 A public announcement system should be installed in every residential unit.

7.2.2 The fire alarm system shall be activated manually by pressing the button/switch fixed next to the analog fire alarm panel.

7.2.3 Alarm sirens shall be installed in all occupied units, at a distance of 75 m from each other, with an intensity of 75 dB across the unit.

7.2.4 The residential compound shall be equipped with a security system to monitor all the sections of the unit and apply the public announcement system.

8. Power Transformers

8.1 Oil-cooled power transformers shall be placed as per the standards of the Electricity and Water Authority.

9. Transportation and Vehicle Safety Standards

9.1 Vehicles shall be subject to annual inspection by the competent local authority.

9.2 The vehicle should be surrounded by suitable lighting to help show its dimensions.

9.3 The name of the company employing the workers should be visibly placed on the vehicle.

9.4 The maximum number of passengers allowed shall be clearly stated, where each passenger shall have one seat.

9.5 Smoking inside the vehicle is prohibited as clearly stated by sticking a “No Smoking” sign.

9.6 A “Frequent Stop” sign should be placed on the rear of the vehicle for warning.

9.7 A contact number should be clearly placed on the vehicle for remarks and complaints.

9.8 The vehicle should be driven according to speed limit signs on the road.

9.9 The vehicle should be air-conditioned.

9.10 All seats should have belts and handgrips.

9.11 Vehicles should have handgrips from the inside to make it easier for the passengers to get off.

9.12 The vehicle should have a first aid kit with easy access thereto. The kit should be placed in a visible place.

9.13 The vehicle should have two fire extinguishers of at least 5 kg each, one placed in the front and the other at the back of the vehicle.

9.14 The vehicle should have at least six hammers to break the window glass in case of emergency.

9.15 Emergency windows should be placed in the front, middle and back of the vehicle. Emergency exits should be indicated with signs.

9.16 The interior light should not disturb the driver.

9.17 The vehicle exit door should have a lighting system.

9.18 The tires should have a special brake system that allows the vehicle to stop in slippery places.

9.19 The vehicle should have tubeless tires.

9.20 The vehicle should be at least semi-automatic.

9.21 Passengers stop should be near their destination to avoid crossing the main roads, unless pedestrian lanes are available.

9.22 During weekends, transportation to and from the nearest public transportation point should be provided, unless the transportation point is close to the residential unit where the worker can reach it on foot (2 km).

10. Onsite Rest Periods

- Shades should be available at the work sites for the workers who wish to take a rest period or eat.
- Food and drinking water should be available onsite and should be preserved in proper health conditions.
- Toilets should be available near the work site.
- Proper sanitary ware should be available within the workers' rest areas.