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SULTANATE OF OMAN
DIRECTORATE GENERAL OF CIVIL DEFENCE

FIRE SAFETY REQUIREMENTS

PART TWO
VEHICLE SERVICE STATIONS

SAFETY REQUIREMENTS FOR SERVICE STATIONS

1. DEFINITIONS

- 1.1 **Service Station:** A site where liquids used as motor fuel are stored, and dispensed from fixed equipment into the fuel tanks of Motor Vehicles. Facilities may be included for the sale of accessories, greasing, changing oil and washing, the repair of tires, replacement of batteries and similar minor maintenance requirements for motor vehicles. It may also include facilities for storage and retaining of kerosene and for vending of small quantities of refreshments.
- 1.2 **Tanker:** A vehicle comprising a traction unit whether rigid, articulated or including a trailer.
- 1.3 **Dispenser:** A measuring or metering unit used for the dispensing of Petroleum Products from the storage tank.
- 1.4 **Concerned Authority:** An organization having responsibility for any of the following in connection with the service station.
- a. Approval of location.
 - b. Approval of plans before construction work commences.
 - c. Issue of license to start construction work.
 - d. Approval of the completed work.
 - e. Issue of license to operate.
- 1.5 **Responsible Person:** A person who has the control of the day-to-day Running of the service station.
- 1.6 **Dangerous Occurrence:** An event which may lead to fire or similar hazardous circumstances.
- 1.7 **Hazardous Areas:**
- A- Zone "0" and area in which a flammable gas/air mixture is continuously present or is present for long period.
 - B- Zone "1" an area in which a flammable gas/air mixture is likely to occur at any time during normal operations.
 - C- Zone "2" an area in which a flammable gas/air mixture is not likely to occur in normal conditions and if it does it will only exist for a short period of time.
- 1.8 **A Non-Hazardous Area:**
A safe area which forms no part of the classified hazardous area according to item 1.7

- 1.9 Intrinsicly Safe Circuit: An electrical circuit which, when installed and operated under the specified conditions, on any electrical spark occurring in normal working, is incapable of causing ignition of a flammable petrol/air mixture.
- 1.10 Intrinsicly Safe Apparatus: An electrical apparatus, so constructed that when installed and operated under the specified conditions, on any electrical sparking occurring in normal working, either in the apparatus or in the circuit associated with it, is incapable of causing an ignition of a flammable petrol/air mixture. ..
- 1.11 Self Service Station: A site where the motor fuel is dispensed from fixed equipment into the fuel tanks of motor vehicles by persons other than the service station attendant.
- 1.12 Watch room: A small room used by a supervisor or an employee whose career is connected by filling operations. The room may also be used for marketing and storing the necessary parts of vehicles.

2. LICENSING

2.1 It is not permitted to establish a petrol filling station until obtaining a certificate of license from Ministry of Petroleum & Minerals (Department of Petroleum Products Affairs), after the approvals from the following authorities:

A- Ministry of Housing

B- Town Planning Authority- wall of the area.

C- Royal Oman Police (Directorate General of Operations, Directorate General of Civil Defense, Directorate General of Traffic).

D- Any other concern authority

2.2 The application shall be submitted to the Ministry of Petroleum (Department of Petroleum Product Affairs) according to the procedures followed, by completing the application form prepared for this purpose. The following documents shall be attached.

A- Copy of the ownership certificate

B- Copy of the site plan (kooky)

C- Plans of the site showing buildings to be erected thereto, together with the location of any buildings in proximity to the site. The plans shall have sufficient details to enable site location to be identified and shall indicate the purposes for which the building will be used.

D- A written obligation by the owner to follow all safety requirements.

2.3 All the safety rules mentioned in these requirements are intended for Application to new petrol service stations, but it can be introduced into Existing stations if its safety situation needs, and also in case of major changes to its design by the owner.

3. Planning **OF SERVICE STATIONS**

3.1 location of **Site**

- a. Any site selected for a service station should be such that adequate space is available to permit safe location of tanks, vent pipes, tank filling points, tank vehicle offloading stands, pumps and dispensers and buildings, in relation both to the operation of service station and to the safety of adjacent premises, should comply with the requirements in this code and also to regulations and instructions of other concerned authorities.
- b. The site should allow safe entry, access and parking for customers vehicles calling for fuelling and other services and for road tank vehicles supplying the service station, particularly making allowance for coincident arrivals, according to the instructions of the Directorate General of Traffic

3.2 layouts

A- General Design.

The buildings, operating areas and equipment of the service station, including any to which the public have access, should be laid out in such a manner as to ensure maximum safety and efficiency of operation of the service station.

B - Safety Distances.

- a. Tank filling points, tank vents, tank vehicle offloading stands, pumps and dispensers should be located so that an accumulation of petroleum vapor is unlikely, and at adequate distances so that no hazardous atmosphere is likely to reach any source of ignition. They should be sited at adequate distances from any opening in a building or access to a below ground area, basement or cellar.
- b. Tank openings, pumps and dispensers should be located so that their centre lines are not less than 4.25m from any fixed source of ignition or from the boundary of the premises.

4. **TANKS**

4.1 The following requirements should apply when installing the tanks:

A -Tank construction material should be compatible with all grades of motor fuels. Tanks should be built to approve standards.

- B -The tank shall be suitable protected against corrosion or made from Corrosion resistant material.
- C -Tanks should be provided with connections for filling, drawing, gauging and venting. There should be no openings to the tanks other than those necessary for filling, gauging and venting.
- D -The filling/dipping pipe should be carried down to within 40mm of tank bottom. The suction pipe should terminate not less than 12mm above the bottom of the filling/dipping pipe so as to maintain a liquid seal.

4.2 Tank Vents

- a. Each tank or each compartment of a multi-compartment tank should have a vent pipe not less than 40 mm in size. Tanks or tank compartments should be independently vented; vents from more than one tank or compartment should not be connected into a common vent pipe. Where vapor balancing facilities are fitted, the vent pipes to tanks containing the same product may be manifold to allow for one common vapor hose connection, according to the approved standards.
- b. The upper end of the vent pipe should discharge upwards in the open air at a greater height than the possible liquid level in any tank vehicle filling the tank. This height should be at least 3.75m above ground level and should not be located within 1.5m of opening windows or other openings of any building.
- c. The open end of the vent pipe should be provided with an open mesh cap or screen, of metal or plastic, sufficient to prevent the entry of birds or leaves. The mesh of the screen should not be finer than 6mm. The screen should be of a material resistant to corrosion.
- d. There should be no entry to basements, cellars or areas below ground level within 1.5m of a point vertically below a vent discharge point.
- e. Vent pipe outlets should be at least 1.5m from the boundary of the service station, except where the boundary is a solid wall extending down to ground level and 1.5m beyond the vent pipe outlet in every other direction. Consideration should be given to the nature of the adjoining property when deciding the proximity of vent pipes to boundaries.
- f. The vapor from vent pipes is heavier than air and flammable. No fixed source of ignition should be permitted in the immediate area of vent pipe outlets.

4.3 Tank gauging facilities:

- a. If the measuring is by means of a dipstick, and the means of a direct filling pipe, the same pipe shall be used for gauging, a steel plate of adequate size and of the same thickness as the tank shall be welded to the bottom of the tank immediately below the filling pipe.
- b. Offset fill pipe: Where a separate dip pipe is provided there should be a spring loaded shut off device or other approved means of closure.

4.4 The following requirements should apply when installing the underground tanks:

- a. Tank filling points, tank vents, tank vehicle offloading stands should be located so that an accumulation of petroleum vapor is unlikely, and at adequate distances so that no hazardous atmosphere is likely to reach any source of ignition. They should be sited at adequate distances from any opening in a building or access to a below-ground area, basement or cellar.
- b. Tank openings, should be located so that their centre lines are not less than 4.25m from any fixed source of ignition from the boundary of the premises or building opening, and should comply with the safety distances determined by Directorate General of Civil Defense according to the fire risks of the surrounding areas.
- c. The area in which an underground tank is installed shall be such that while motor fuels are being discharged from the tanker into the storage tank, the tanker shall be wholly within the boundaries of the service station.

4.5 Tank protection against corrosion

- a. Buried steel tanks should be adequately protected against corrosion having regard to the type of soil, water table and other prevailing conditions in the area where the tank is to be installed.

b. Where the tank is constructed in steel and fully protected against possible soil corrosion it may be installed in a simple excavation back-filled with clean sand. The sand surround should not be less than 150mm thick and should be completely surround the tank except for the Manhole opening.
- c. Where the tank is constructed in steel and is not fully protected against possible soil corrosion, it should be installed in a fine concrete satisfying the following requirements:
 - Grade designation – 30
 - Type of cement- sulphate resisting Portland.
 - Nominal maximum size of aggregate- 20mm.
 - Method of compaction- needle vibration.

Before the tank is installed all rust or scale should be removed from the external surface immediately before applying the protective finish, which may consist of one coat of red lead primer followed by one liberal coat of bitumen or two coats of bituminous paint or other suitable protective materials. The fine concrete surround should have a minimum thickness of 150mm and should surround the tank completely except for the manhole opening.

d. Where the tank is not constructed in steel special consideration should be given to the method of installation.

4.6 After lowering into the excavation and before it is surrounded by concrete or sand, the tank shall be subjected to an internal air pressure of 0.7 Bar (10 psi) for not less than 24 hours or filled with water and subjected to a hydrostatic pressure of 0.7 bar (10 psi) for not less than 60 minutes to ensure that there is no leakage from the tank and its connection.

4.7 The excavation above tank and its surrounding shall be filled with clean sand, or other suitable non-corrosive materials to the appropriate level.

The manhole, filling, suction and venting connections, shall be enclosed in a sturdily constructed brick or concrete chamber. The cover to the chamber shall be raised 25mm above forecourt level and ramped.

4.8 Where there is vehicular movement in the areas over the tank, this area shall be covered with reinforced concrete or asphaltic concrete to the required level. The reinforced shall extend at least 300mm horizontally in all directions beyond the plane of the tank.

5. PUMPS AND DISPENSING SYSTEMS.

5.1 The following requirements shall be fulfilled:

a. Pumps may be located in the dispensing units on the forecourt, or they may be located elsewhere and transfer product to individual or multiple dispensing units.

It is recommended that dispensing units should be located on a slightly raised island on the forecourt or otherwise protected from damage by collision from vehicles.

c. Diesel dispensers should be installed on special separate islands, with adequate distances from petrol dispensers. This is to provide safety movement for trucks or vehicles calling for fuelling with diesel. These vehicles are often used for the transportation of dangerous materials. This will ensure that there is no risk of interruption or danger to other vehicles movement in the station area.

- D Pumps located remote from the dispensing units should be pro-Tested against physical damage.
 - E. Pumps and dispensing units should be designed, constructed and tested to accepted engineering standards.
 - f. Pumps and dispensing units should be adequately secured in position. Each suction pipe riser should terminate in a shallow liquid-tight pit beneath the pump it serves. The pit should be constructed with walls and floor of concrete not less than 150mm in thickness. It should be as shallow as is practicable and in no case deeper than is necessary to accommodate the flexible connection between the suction pipe riser and the pump. The ground enclosed within the pump housing should otherwise be paved with concrete.
- great power operated pump shall be fitted with either a limiting device or a preset device to prevent a continuous out flow of more than 100 liters for Class 1 Product and 150 liters for others in one operation.
- h. A control shall be provided to permit the pump to operate only when the nozzle is removed from its normal position and the switch on the pump is manually actuated. This control shall also stop the pump when the nozzle is returned to its normal position.
 - i. The maximum bypass pressure of the pump shall not exceed 2 bars.
- Golf a sight glass unit is fitted; it shall be capable of withstanding hay Prostatic pressure of 5 bars.
- Kithara shall be adequate flow of ventilating air across the dispenser unit and the total effective area of ventilation openings shall not be less than 80 cm².
- l. Dispensing hose should be to approve standards. It should be capable of withstanding a test pressure of 5 bars, sufficiently flexible to allow easy handling, and should be of material compatible with the product being handled. The cover shall be smooth and resistant to weathering and abrasion.

5.2 Hose Nozzles

- A - The nozzle shall be provided with an automatic cut-off to prevent spillage due to blow-back or to overfilling and the maximum flow-rate to operate the cut-off shall not be more than one half of the flow rate for which the retaining latch open device is currently Set.
- B - An attendant operated pumps no stop or catch shall be provided on the nozzle which would keep the nozzle valve open, unless all The following conditions are satisfied:
 - Provision shall be made to ensure that the nozzle is not displaced from the filling pipe of a vehicle during normal filling operations.

- In the event of the nozzle falling out of the filling pipe of the vehicle, the operating lever of the nozzle valve shall automatically be released from the retaining latch upon impact of the nozzle with the vehicle or the ground, and the flow of petrol shall stop immediately.
- The nozzle shall be attached to the delivery hose in such a manner that in the event of a vehicle moving while the nozzle remains in the filling pipe, the flow of petrol will stop and the nozzle becomes released from the delivery assembly before damage to the control valve, coupling, delivery hose or pump can occur.

5.3 Dispensing Unit and Nozzle in Self Service Stations.

In addition to the above, the following requirements shall be fulfilled;

- A. For self-service operation particular attention should be paid to surrounding risks and to the layout of the premises to afford ease of entry and exit for customers' vehicles to and from the forecourt area. Local conditions may make a site unsuitable for self-service.
 - B. In self-service stations supervision shall be exercised at all times by an attendant stationed at the control point where the individual petrol pump and the forecourt emergency switches are located.
 - C. Petrol pumps and adjacent dispensing areas shall be clearly and readily visible from the control point so that no obstacle except for vehicles being fuelled is liable to be placed or to come between the dispensing areas on the control point.
 - D. Communication shall be able to be made at all times without difficulty, between the attendants having to leave the control point.
 - E. In self-service stations where coin-operated or card-operated petrol pumps are installed, there shall be at least one forecourt attendant on duty while the station is open to the public.
 - F. Provision shall be made for rendering inoperative any device on the nozzle which would keep the nozzle valve open.
- Gather minimum flow rate to operate the cut-off shall be not more than 9 liters per minute.
- H. After the cut-off has operated, it shall not be possible to re-establish flow without first returning the nozzle control lever to the 'off' position.
 - I. The nozzle shall be fitted with a device to prevent delivery unless either the nozzle is properly located or the spout is pointing down.

6. PIPES AND FITTINGS

- a. The pipes, valves and fittings together with any jointing materials, shall be compatible with and not affected by motor fuels.

Pipes and their joints shall not become damaged or leak under stresses induced by thermal expansion or other forces occurring in normal service. They shall withstand the stresses temperatures arising during fire exposure or be suitably protected against these.
- b. Sufficient number of valves shall be provided in piping systems for the efficient and safe operation, during normal operation and in the event of any damage.
- c. Piping subjected to external corrosion shall be painted or suitably protected against corrosion.
- d. Pipe lines and connections shall be subject to an internal pressure of 0.7 bar (10 psi), for not less than 10 minutes, to ensure that there is no leak on the pipe lines before they are covered with concrete or sand. Underground pipe lines shall be substantially supported and covered in not less than 150mm of fine concrete or protected by stone slabs. Where there is vehicular movement over the pipelines, the area shall be covered with reinforced concrete or to be installed in pipe trenches and fixed steel cover, or to be provided by a steel sleeve around the buried pipes.
- e. Any trench in which pipes are laid shall be of dimensions adequate to permit access to valves and fittings.

7. ELECTRICAL INSTALLATION

7.1 The following requirements should apply when installing electrical wiring:

- a. Wiring shall be installed, so far as is practicable, in positions which will prevent its exposure to mechanical damage or to the effect of heat, corrosive substances or solvents. If such exposure is unavoidable, appropriate measures shall be taken to protect the wiring.
- b. Where cables in a conduit pass through a floor, wall, partition or ceiling, the hole provided for the conduit shall be filled with cement or similar non-combustible material to the full thickness of the floor, wall, partition or ceiling, through which it passes.
- c. All equipment, connections and wiring, the function of which is not clear, shall be clearly marked to indicate its function.
- d. The overhead power supply line shall be terminated outside the Zone 1 and Zone 2 areas.
- e. Fuses or circuit-breakers shall not be situated within the housing of the petrol pumps.

- f. Socket outlets and plugs in Zone 1 areas shall be of flameproof design and the flexible cable shall be suitably protected with a flexible metallic screen sheathed overall.
- g. Socket outlets and plugs in Zone 2 areas shall be of a type specifically designed for use in Zone 2 areas such as interlocked plugs and sockets with mercury-in-glass switches or enclosed make-break micro switches. Socket outlets of flameproof design may also be used.
- h. Electrical equipment, apparatus and wiring, installed within the danger area, shall be to the appropriate Zone requirements, as mentioned in Table (7.1).
- i. Electrical equipment which is not intrinsically safe shall not be connected in the same circuit with intrinsically safe equipment.
- j. Portable and mobile apparatus, other than hand lamps supplied by flexible cables, shall be provided with earth-leakage circuit-breakers.
- k. Portable lamps used in Zone 1 and 2 areas, shall be of flameproof or intrinsically safe type and shall not operate at a voltage exceeding 50v. to earth.
- l. Joints in conduits shall be made water tight. Conduits passing from a safe area to a hazardous area shall be provided with a flameproof sealing box or any other approved sealants protection, at the point where the conduit enters the dangerous area.

7.2 Dispenser Circuits

A. Single dispenser:

- The dispenser shall be provided with two circuits to control individually the dispenser motor and its integrated lighting.

B. Dual dispensers:

- Dual dispensers shall be provided with three separate sub-circuits, one for each separate pump motor and one for the integral lighting.
- Each sub-circuit shall be protected by a suitable circuit-breaker of a fuse of suitable current carrying capacity.

7.3 Emergency switch

In addition to the main switch controlling the electrical installation of the service station, a separate emergency switch shall be provided in the circuit to isolate the electricity supply from all petrol pumps and integral pump lighting. It shall be so located and positioned as to be readily visible and easily accessible and at a safe distance from any opening to a storage tank, any petrol pump or venting pipe.

7.4 Earthing

- A- The metal enclosure of all electrical equipment, conduits, junction's boxes and metal sheathing of cable, shall be properly earthed.
- B - Earth leakage circuit breakers of the current operated or voltage operated type shall be used.

7.5 Lighting and Ventilation

- A - Lighting in the service station shall be adequate for the tasks to be performed, but in any case the intensity of light in the forecourt and lubrication area shall be not less than 100 lux at floor level.
- 8 - Lamps and lamp holders shall be of totally enclosed type within the dangerous areas.
- C -Service Station buildings should be provided with active and suitable adequate ventilation.

7.6 The motor generator room:

The motor/generator working on oil (if any) shall be housed in a separate room, specially constructed for this purpose at adequate safety distance from any opening to a storage tank or any petrol pump.

8. SAFETY PRECAUTIONS TO BE OBSERVED DURING OPERATIONS

8.1 Tanker Off-loading:

- a. The tanker shall be completely within the boundary of the service station. It shall be so positioned that it can be driven directly from the site in the event of a dangerous occurrence.
- b. The handbrake shall be on and inadvertent movement of the tanker shall be prevented.
- c. Any static electrical charge on the tanker shall be discharged in a safe manner before delivery of petrol into the storage tank.
- d. No other vehicle movement shall be permitted within 4.5m from the tanker discharge manifold during offloading.
- e. The tanker and the storage tank shall be gauged to make sure the tank can receive the quantity to be delivered.
- f. The vicinity of vents shall be checked for possible sources of ignition.

- g. The driver of the tanker shall stay in the vicinity of the valve at the point where the delivery hose is connected to the tanker. If there is evidence of liquid petrol being ejected, the delivery shall be stopped.
- h. At the end of delivery, the storage tank shall be gauged and the filling pipe cap and manhole chamber cover replaced.

8.2 Fuelling Of Motor Vehicles:

- a. The engine of the vehicle shall be switched off.
- b. The delivery hose nozzle shall be inserted firmly into the filling pipe of the vehicle and its contact with the pipe shall be maintained until the completion of delivery. Care shall be exercised to prevent spillage of petrol during filling.
- c. The delivery hose shall not be twisted or stretched and it shall be replaced in its normal position after delivery has been completed.

8.3 Filling of Portable Containers:

- a. Class I Petroleum should only be filled into an approved type of portable container, and the container should be securely closed immediately after the filling is completed. On no account should an open type of vessel be used.
- b. Hose nozzles, whether manual or automatic, should be held open manually during the filling of a portable container.
- c. Containers should be clearly marked with the name of the product with which they are filled, and in the case of Class I Petroleum the marking should be in accordance with any statutory regulations.

9. FIRE PRECAUTIONS

9.1 Building requirements:

- A- Service station buildings should be constructed generally of non-combustible materials to conform to local building regulations. Flooring material should be oil and water-resistant and as far as possible provide a non-slip surface.
- B - Buildings should be adequately ventilated. The type and location of heating apparatus should be such that there will be no possibility of a source of ignition in a hazardous area, either during normal operations or in the event of a spillage on the forecourt.

C - Doors should be provided and located so as to provide a ready means of escape in the event of fire. Any means provided for bolting or locking the doors should be such that they can easily be opened from the inside at all times when the service station is open for business.

9.2 Firefighting equipments:

Adequate equipment and materials to fighting the initial stages of a fire shall be provided in the service station and other buildings within the service station boundary.

The following is recommended as a guide to the amount of fire fighting equipment:

A. An ample supply of clean dry sand to be provided at suitable places.

B. Dry Powder extinguishers of 12 kg capacity (minimum)

4 dispensers or less - 2 extinguishers

5-8 dispensers 3 extinguishers

And one more extinguisher for every additional 3 dispensers.

C. There shall be at least one 12 kg. Capacity (minimum) dry chemical fire extinguisher near the petrol tank opening and one near the entrance of the generator room (if any).

D. As recommended by the Directorate General of Civil Defense, provision may be made to an adequate supply of water, from hydrants connected to the main town supply line or from an overhead water tank provided within the station. Fire hydrants should be from approved type and similar to the type used by the Directorate General of Civil Defense.

E. All fire fighting equipment should be located where it is, and will remain, accessible and unobstructed. It should be ensured that everyone concerned knows where it is. Extinguishers should not be covered up, nor should things be hung from them so that taking them down would be difficult. They should be suitably mounted so as to protect them from deterioration.

F. Fire extinguishers, and any other fire fighting equipment provided, should be regularly inspected, tested and maintained to manufacturer's recommendations.

Extinguishers should be sealed, where provision is made for sealing, to indicate that they have not been discharged. A record of inspections and tests should be kept in a register, and the date of inspection shown on the appliance.

9.3 Sources of Ignition **Should Be Avoided:**

- a. Smoking shall not be permitted anywhere inside Zone 1 and Zone 2 areas of the service station.
- b. Sources of ignition such as open flames, cutting and welding etc. shall not be introduced into dangerous areas; hot surfaces, frictional heat, sparks, etc. shall be eliminated from such areas; the danger of spontaneous combustion shall be avoided.
- c. Accidental spillage of petrol shall be removed immediately.
- d. Petrol shall never be used for cleaning.
- e. Extra care shall be taken when fuelling recreational vehicles fitted with gas fuelled stoves, refrigerators, water heaters or similar appliances.

10. HOUSE-KEEPING

- a. Tools not in use shall be kept on a tool-board provided for the purpose.
- b. All floors shall be maintained in a clean and non-slip condition.
- c. Rubbish shall not be allowed to accumulate and all dirty rags and empty oil cans shall be collected and placed in suitable rubbish containers.
- d. Any waste material such as oil shall be disposed of in a safe manner; such material shall not be dumped into a sewer or septic tank, not spread over the ground

11. SERVICES

- a. Correct types of tools shall be used. Worn or ragged tools shall not be used. Electrical tools should be suited to the zone classification of the area in which they are to be used.
- b. Checking and Exchanging Oil:
 - Raise the bonnet to a safe position and secure it.
 - Switch off the engine.
 - Remove any spill after topping up or changing the oil.

12. TRAINING

- a. Service station attendants shall be trained in the use of fire extinguishers and the procedure to be adopted in the case of fire or other similar emergency.

- b. Service station shall be provided with a facility to call Civil Defense parties, telephone numbers of Directorate General of Civil Defense and the Royal Oman Police shall be displayed in a prominent place.
- c. Service station attendants shall be trained in the safe use of pumps and other equipment, and in the prevention of any dangerous occurrence.

13. PERSONNEL PROTECTION

- a. Suitable personnel protection equipment such as gloves, goggles, safety glasses, safety shoes, aprons, etc. shall be provided to personnel, depending on the nature of the work.
- b. Any unsafe condition which can cause accidents, shall be reported immediately and the necessary corrective action taken as soon as possible.
- c. All operational and maintenance work shall be planned and supervised by a responsible person who shall ensure that all necessary precautions are observed.
- d. Any defects in the machinery shall be attended to immediately and it shall not be used until the defect is rectified.
- e. Precautions shall be taken to avoid hazards and any required protective equipment shall be worn.
- f. Clothing's oiled with petrol or any other flammable material, shall be removed immediately and any area of the body affected, shall be washed thoroughly. Loose or torn clothing shall not be worn by any person working in the service station.
- g. Substances, which can cause dermatitis or skin burns, shall be washed immediately from any affected area of the body and any necessary first aid treatment shall be rendered.
- h. Any accident causing injuries shall be attended immediately by the first-aid personnel; if hospitalization of the injured person is necessary, it shall be affected without delay.
- i. A first-aid box, equipped for the treatment of minor injuries and burns shall be available in each service station. At least one person shall be trained in first aid treatment.

14. GENERAL REQUIREMENTS

- a. Car washing facilities, shall be as far as possible from dispensing units

With an adequate safety distance. Car wash design would keep traffic flows separate and offloading points well clear of everything.

- b. Ground shall be sloped from office building towards washing facilities.
- c. Entrances and Exits shall be marked clearly "Entrance only" and "Exit only". Signs shall comply with standards and requirements of Ministry of Communication and Royal Oman Police, Directorate General of Traffic.
- d. Suitable directional signs or markings should be provided for traffic flow to and from the refueling islands and for inter-station traffic.
- e. Drainage:
 - Provision should be made to prevent the escape of product from the premises into any water course, public drain or sewer or into or on to adjoining property. Surface water which is liable to be contaminated with petroleum may be required to be passed through an interceptor before draining from the premises.
 - Provision should be made either by grading, drainage galleys or raised sills at entrances to buildings, or other means to prevent any spillage from the forecourt are draining on to any adjacent building.

15. NOTICES, MARKING AND OPERATING INSTRUCTIONS

- a. The following warning notices in Arabic and English shall be as approved standard and displayed in a prominent position:



- b. The following notice shall be conspicuously displayed adjacent to the emergency switch in Arabic and English. "EMERGENCY SWITCH"
- c. Tanks shall have an information plate indicating the kind of fuel stored in each tank.
- d. A copy of the license issued by the authority, setting out the conditions to be observed by persons employed shall be displayed in a prominent position.

TABLE 7.1

ELECTRICAL EQUIPMENT IN CLASSIFIED AREAS WITHIN SERVICE STATIONS

Factor	Extent of Classified Area	Zone Classification
BURIED TANK		
Fill opening or any other opening to the tank	Up to 1 m above ground level within a horizontal radius Of 1.5m from the edge of the manhole and down to ground level.	2
	Any chamber or pit in the Zone 2 area which does not include an opening to a storage tank.	1
	Any manhole chamber containing a normal sealed opening to a storage tank.	1
Above-ground offset filling connection tight fill	Up to 0.5m above the fill connection within a horizontal Radius of 1.5m from the connection and down to ground level.	2
Vent discharge opening	Within 1.5m of the open end of the vent extending in all directions.	1
	Within 1.5m of any other part of the vent riser pipe.	2
DISPENSING UNITS		
	Within housing of dispensing unit	1
	Any pit, box or space below forecourt or surrounding ground level, any part of which is within a Zone 1 or Zone 2 classified area.	1
	To a distance of 3m from the centre line of the dispensing unit to a height of 1.25m above ground level and then reducing Uniformly between 3m and 4.25m from the centre line to reach ground level at 4.25m.	2
	When a dispenser is fitted with a sight glass and a flexible hose then, if the connection joints are outside the housing of the Dispenser, a hazardous area exists forming a cylinder down to Ground level (or to meet the Zone 2 area defined for the dispenser itself) the radius of the cylinder being 0.75m. This cylinder extends upwards above the sight glass and hose joint connections for 150mm.	2
	When a dispenser has a radial arm mounted immediately above the dispenser-carrying joints for sight glasses and/or Those connections-then the conditions set down in the above Paragraph applies saving that the radius of the Zone 2 cylinder is 0.75m from the center of the sight glass and/or hose connection plus the radius of the radial arm.	2
	When a dispenser has a flexible hose depending from a fixed high level point at which joints for the hose and/or a sight glass Are made (at a height not greater than 2.5m above ground level) then a Zone 2 area exists forming a cylinder down to ground level (or to meet the Zone 2 area defined for the dispenser itself) the radius of the cylinder being 0.75m. This cylinder extends upwards above the sight glass and hose joint connections For 150 mm.	2

TABLE 7.1

ELECTRICAL EQUIPMENT IN CLASSIFIED AREAS WITHIN SERVICE STATIONS

Factor	Extent of Classified Area	Zone Classification
LIGHT FITTING MOUNTED ABOVE A DISPENSER	Connected to the dispenser in a manner which allows the passage of vapor from inside the dispenser housing into the light fitting.	
	If within the Zone 2 area created by any configuration of Dispenser unit above.	2
REMOTE PUMP OUTDOOR	Within the housing of the pump and any pit, box or space below ground level within a horizontal distance of 1.5m From the pump housing.	1
	Within 1.5m of the pumping housing extending in all horizontal directions and down to ground level.	2
INSPECTION PITS	Pits in maintenance or inspection bays or within a Zone 2 area	1
	Very large pits or sub-level inspection bays situated in non-hazardous areas where good permanent ventilation obtains.	2
SALES, STORAGE, RESTROOMS AND KIOSK	If there is any opening to these rooms within a Zone 2 classified areas, the whole area of the room, up to a height of 1.25m.	2

Note: Where a source of hazard can give rise to both a Zone 1 and a Zone 2 area, it should not be implied that Zone 2 is an extension of Zone 1. It is important to understand that the conditions which give rise to a Zone 1 or a Zone 2 are quite different. (See 1.7 to 1.9- Definitions)

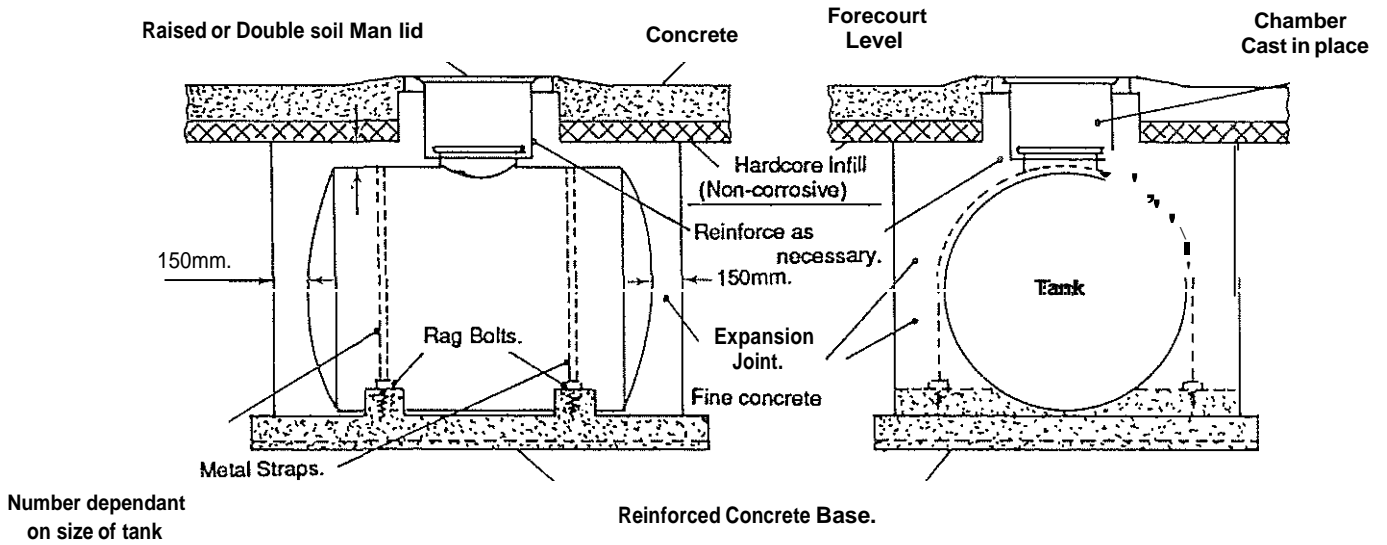


FIG. 1 TANKS INSTALLED IN FINE CONCRETE

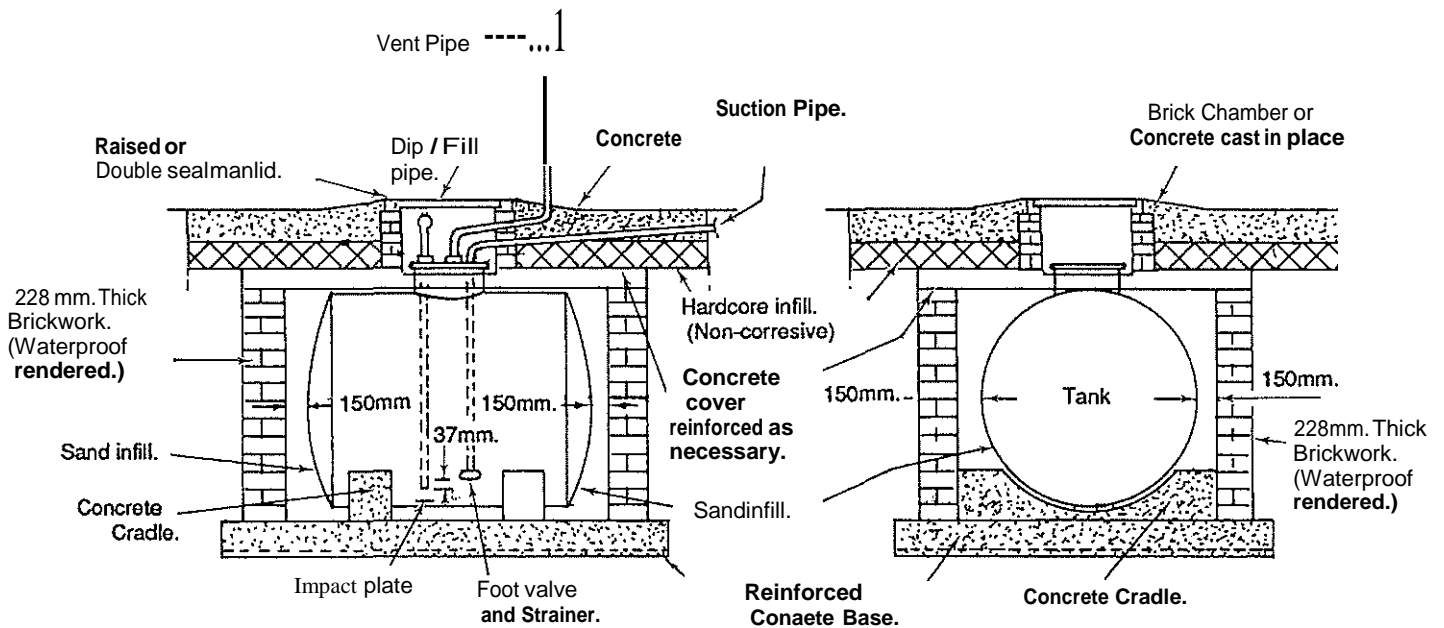


FIG. 2. TANKS INSTALLED IN BRICK AND CONCRETE VAULT

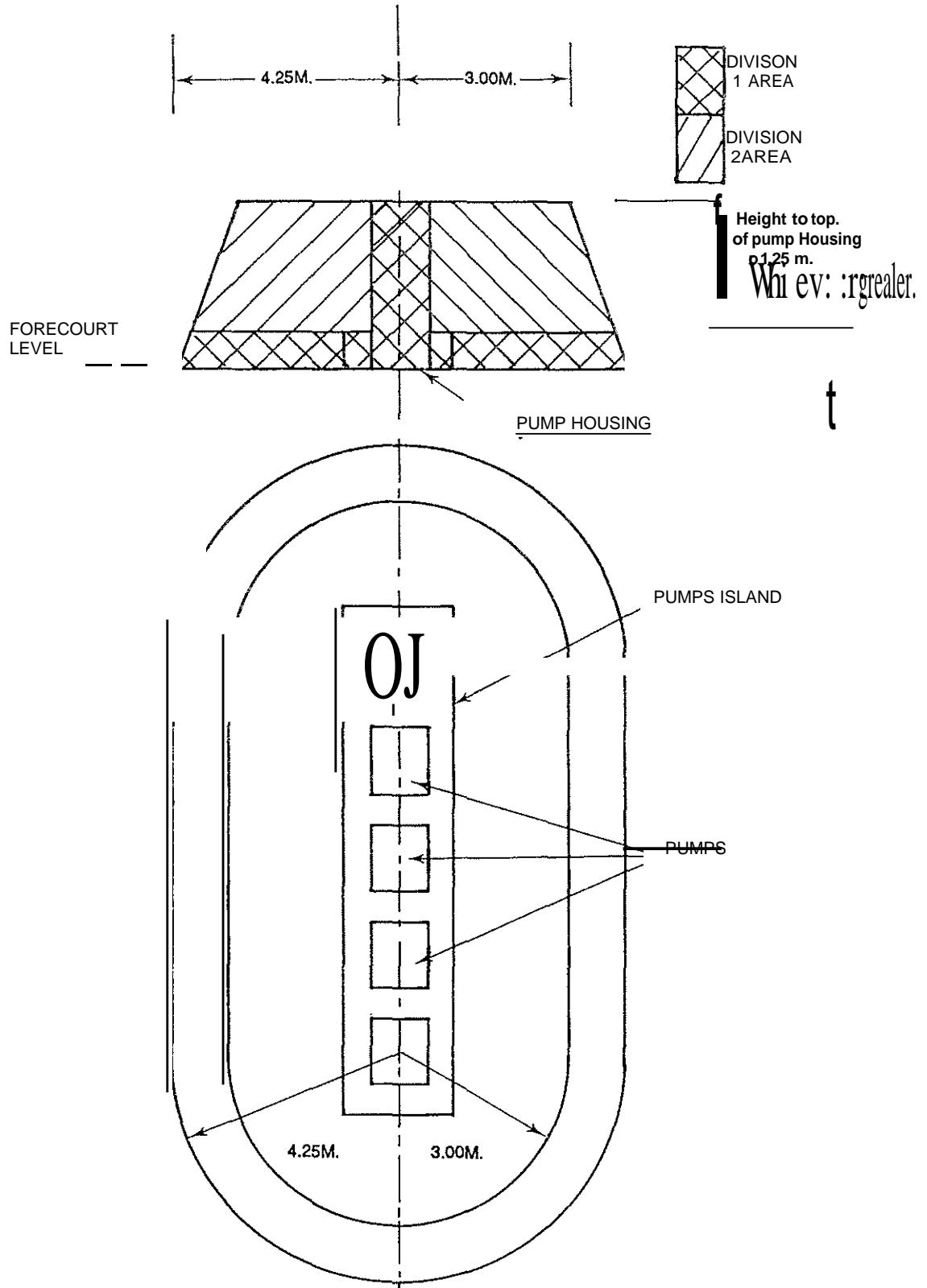


FIG. 3. LIMITES OF DANGEROUS AREAS FOR PUMPS AND PUMP ISLAND.

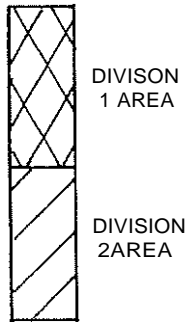
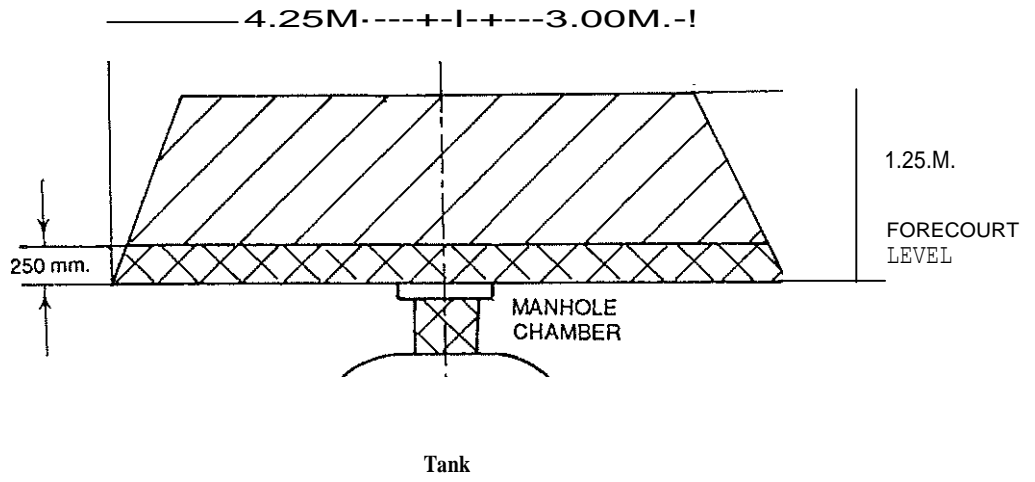


FIG. 4. LIMITS OF DANGEROUS AREA FOR TANK OPENING

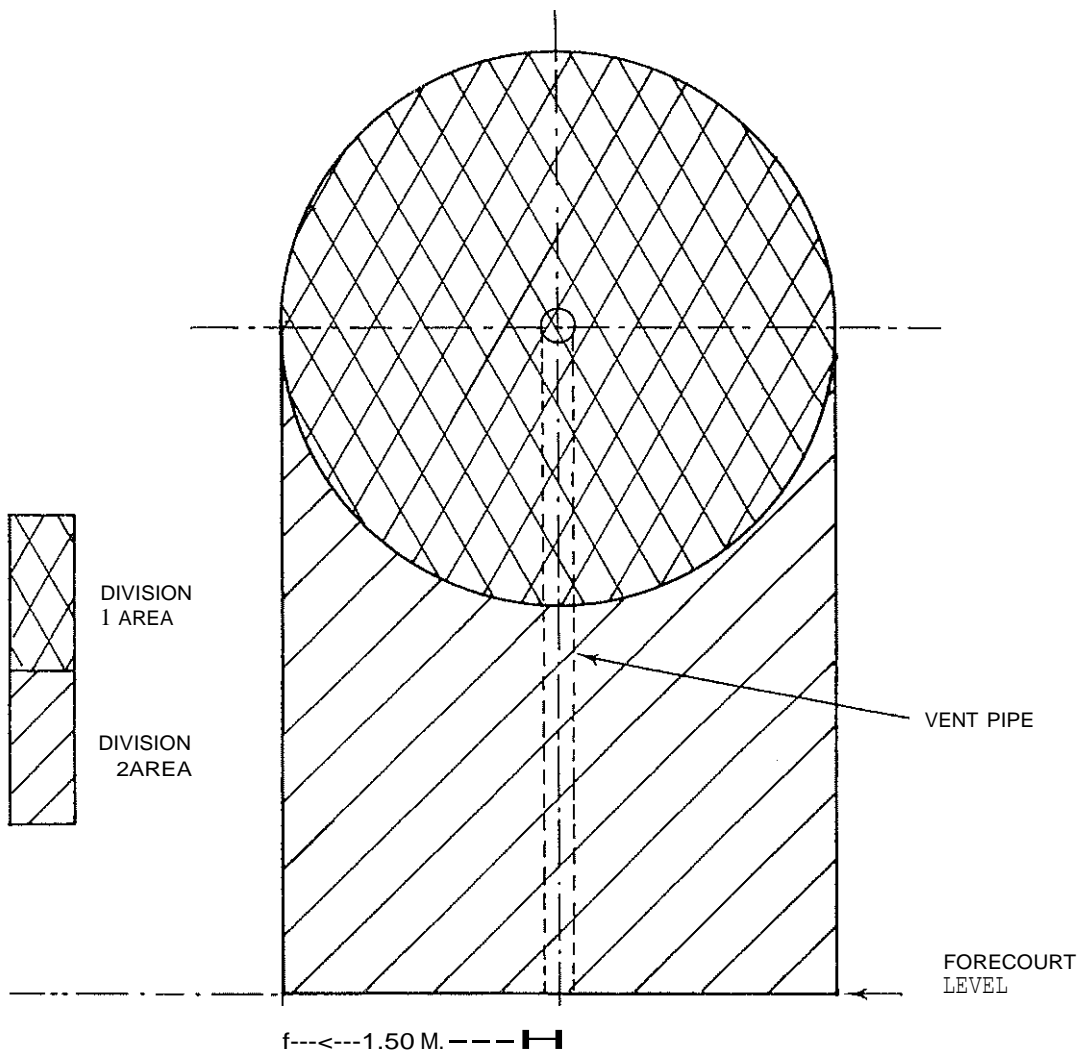
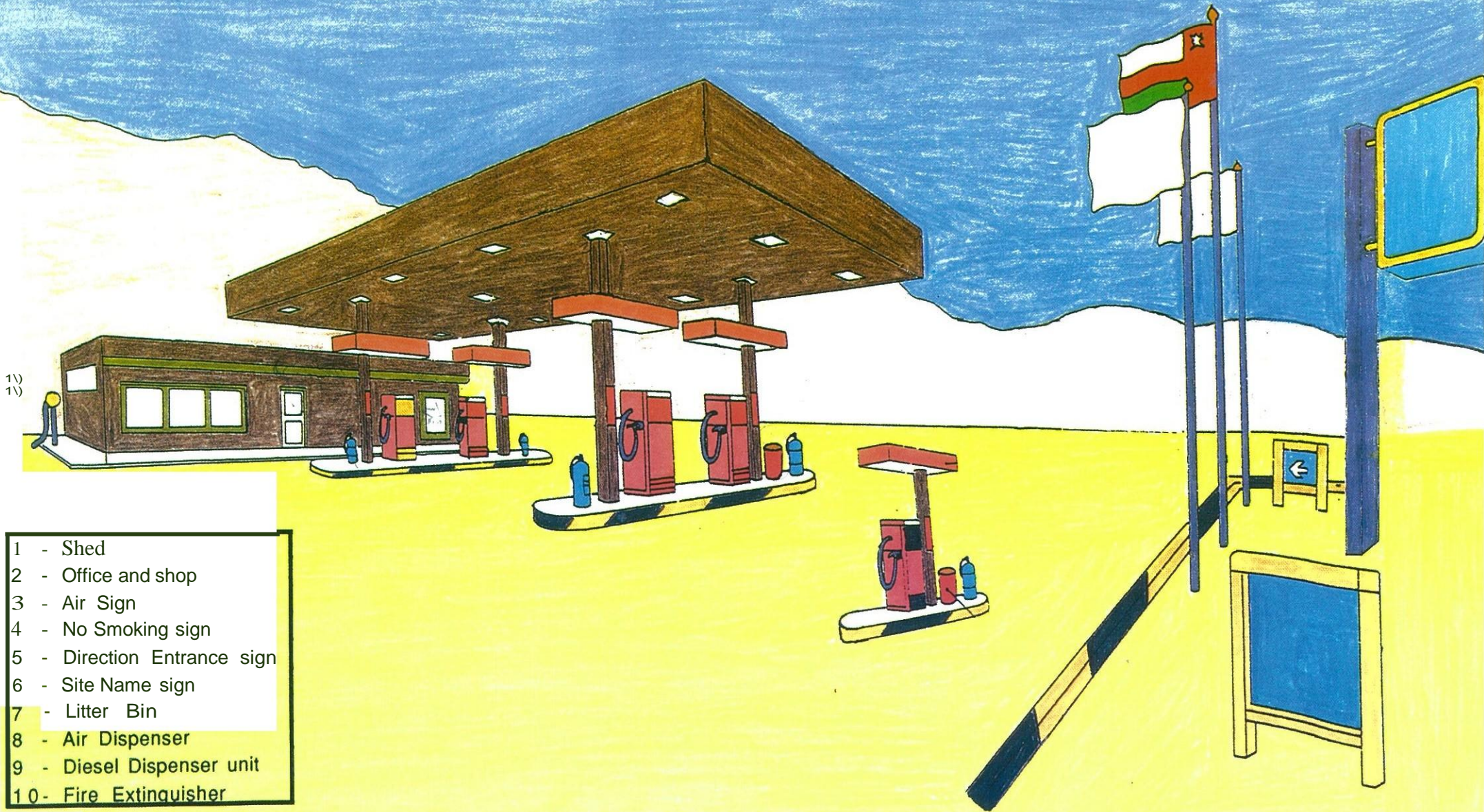


FIG. 5. LIMITS OF DANGEROUS AREA FOR VENT PIPE.

{ General design of a petrol filling station. (as a guide) }



1)
1)

- 1 - Shed
- 2 - Office and shop
- 3 - Air Sign
- 4 - No Smoking sign
- 5 - Direction Entrance sign
- 6 - Site Name sign
- 7 - Litter Bin
- 8 - Air Dispenser
- 9 - Diesel Dispenser unit
- 10 - Fire Extinguisher

Notice:

Distances and rules mentioned in these requirements should be considered.