10. CONTAINERS.

A. Design and Construction

(1) All containers, except containers designed to operate under refrigerated or cryogenic conditions, in which liquefied petroleum gases are stored and/or transported or in which liquefied petroleum gases are placed for utilization through a liquefied petroleum gas system, shall be constructed to comply with the provisions of the latest edition of Section VIII, ASME Boiler Construction Code. All vessels shall be constructed for a safe working pressure of not less than 250 PSIG. For motor fuel containers mounted on automobiles, buses, industrial and forklift trucks, see Section 13, Par. A. (1).

EXCEPTIONS–Vessels, except those designed to operate under refrigerated or cryogenic conditions, used for commercial fuel purposes located at cotton gins, rice dryers, and rice wells, and vessels used for any other stationary fuel purposes, underground installation where permitted, vessels used in connection with a vaporizer, and vessels used exclusively for the storage and/or transportation of Butane, may be constructed for a safe working pressure of not less than 125 PSIG. The safety valves on all containers must be set to start to discharge at the maximum allowable working pressure of the container. A plus 10% tolerance will be permitted.

(2) Blueprints showing the type or types of all containers shall be filed with the Board for approval before shipment is made into the State.

(3) **REFRIGERATED OR CRYOGENIC STORAGE OF LIQUEFIED PETROLEUM GASES**– All plans and specifications covering the storage of Liquefied Petroleum Gases aboveground or underground under refrigerated or cryogenic conditions shall be submitted to the Board for review and approval prior to installation.
The location or site for the storage of Liquefied Petroleum Gases aboveground or underground under refrigerated or cryogenic conditions shall be examined and approved by a representative of the Board prior to installation.

B. Shop inspection shall be made of all containers during construction by a duly authorized inspector who holds a National Board Commission, and who is employed by an insurance company, state, or municipality.

C. **EXCEPTION:** Small containers of thirty (30) water gallon capacity, or less, may be constructed to comply with the regulations of the United States Department of Transportation (DOT) covering containers used for the storage of liquefied petroleum gases. Such containers shall be constructed for a pressure of not less than two-hundred and forty (240) pounds per square inch, shall be used only for the storage of a liquefied petroleum gas mixture known as Propane. These small containers shall be filled only by weight at approved central filling stations, the amount of gas placed in a container to be determined by weighing in accordance with the appropriate densities given in Table No. 4, page 93, of these regulations. (Department of Transportation [DOT] formerly Interstate Commerce Commissions [ICC].)

Larger DOT containers are approved for domestic use, but, must be filled on the customer's premise. DOT containers larger than thirty (30) water gallon capacity are not to be transported for filling. These stationary DOT containers must be set the proper distance from a building according to distance chart outlined in rules and regulations.

All DOT cylinders using liquefied petroleum gases shall be maintained and inspected in compliance with DOT requirements. (For location of bottle filling plants, see Section 17.)

DOT forklift cylinders may be filled by volume rather than weight, if, so equipped and designed for filling by volume as outlined in NFPA 58. ~~Sections 4-4.3.2, 4-4.3.3 and 4-4.3.4 listed below:~~

The volumetric method shall be permitted to be used for the following containers if designed and equipped for filling by volume:

(a) DOT specifications cylinders of less than 2001b (91 kg) water capacity that are not subject to DOT jurisdiction (such as, but not limited to, motor fuel containers on vehicles not in interstate commerce or cylinders filled at the installation).

(b) DOT specification cylinders of 2001b (91 kg) water capacity or more. *(See DOT regulations requiring spot weight checks.)*

(c) Cargo tanks or portable tank containers complying with DOT Specifications MC-330, MC-331 or DOT 51.

(d) ASME and API-ASME containers complying with ~~2-2.1.3 or 2-2.2.2.~~the latest edition Pamphlet No. 58, National Fire Protection Association.

~~4-4.3.3~~ When the volumetric method is used, it shall be in accordance with the following:

(a) If a maximum fixed liquid level gauge, or a variable liquid level gauge without liquid volume temperature correction is used, the liquid level indicated by these gauges must be computed on the basis of the maximum permitted filling density when the liquid is at 40°F (4.4°C) for aboveground containers or at 50°F (10°C) for underground containers.

(b) When a variable liquid level gauge is used and the liquid volume is corrected for temperature, the maximum permitted liquid level shall be in accordance with ~~Tables 4-4.2.3(a), (b), and (c).~~ Table 4.

(c) Containers with a water capacity of 2,000 gal (7.6 m') or less, filled at consumer sites, shall be gauged in accordance with the following:

(1) The variable gauge shall have been checked for accuracy by comparison with the liquid level indicated by the fixed maximum liquid level gauge.

(2) If the container is to be filled beyond the level indicated by the fixed maximum liquid level gauge, the reading of the variable gauge, adjusted for the error indicated by the check with the fixed maximum liquid level gauge, shall be corrected for the LP-Gas liquid temperature.

Exception: Containers fabricated on or before December 31, 1965, shall be exempt from this provision.

4-4.3.4 When containers are to be filled volumetrically by a variable liquid level gauge ~~in accordance with 4-4.3.3(b)~~, provisions shall be made for determining the liquid temperature. ~~*(see F-3.1.2).*~~

FILLING OF DOT FORK LIFT CYLINDERS FROM A DELIVERY TRUCK IS PROHIBITED.

(1) TRANSPORTATION OF DOT CYLINDERS - Containers having an individual water capacity not exceeding 45 lbs.
(LP Gas capacity) transported in open vehicles may be transported in other than the upright position.

One Hundred pound (LP Gas capacity) cylinders shall not be transported in the trunk of an automobile or in any vehicle unless it can be transported in an upright manner with the vapor space in communication with the safety relief device.

All cylinders with a capacity of over 40lbs of propane, that are not fitted with an OPD valve, must be transported and stored with a POL plug. Cylinder valves requiring maintenance that are fifteen (15) years or older must be replaced. Board approved signage must be displayed in a prominent location. Permit holders must use the Board approved form to report new and existing station locations. Class 1 and Class 3 permit holder will provide Board approved training for exchange station employees. Record of such training will be transmitted to the Board office.

D. All containers shall have the manufacturer's name plate firmly attached to the container, designating the manufacturer's serial number, maximum allowable working pressure, year built, diameter, length, shell and head thickness, and capacity in water gallons.

On underground containers, the manufacturer's name plate shall also be attached in a firm manner in the dome cover, as well as on the tank itself.

(See also "Fit for Service" section regarding replacement name plates).

E. All containers, except storage, shall be fully equipped by the manufacturer with the required fittings, and all connections tested under air pressure of not less than 75 psi gauge. Air pressure of not less than 25 psi gauge or more than 75 psi gauge shall be left in the container when shipment is made into the State by the manufacturer or jobber, and this information shall be included in the report of shipment provided for in the following paragraph.

F. Manufacturers and jobbers shall forward to the Board notice of shipment and manufacturer's data report, together with the applicable fee, for each container on the same day that shipment of container is made into the State.

G. All containers constructed for domestic, fuel, or commercial use, equipped with liquid and vapor outlets, shall have the liquid and vapor outlets plainly marked with the words "LIQUID" and "VAPOR" on a permanent plate in letters not less than three-sixteenth (3/16) inch in height, this plate to be attached to the tank as near the liquid and vapor outlet valves as possible, or to the valve connections at the time the valves are installed. When a connection is provided for liquid transfer purposes, this connection must be equipped with both an excess flow check valve and a liquid shutoff valve.

H. Containers with foundations attached (portable or semiportable containers with suitable steel " runners" or "skids" and popularly known in the industry as "skid tanks") shall be equipped with skids not less than two (2) inches or more than twelve (12) inches below the outside bottom of the container shell.

(1) When connected to the piping, and not permanently located on fire resisting foundations, such connections shall be sufficiently flexible to minimize the possibility of breakage or leakage of connections if container settles, moves, or is otherwise displaced.

(2) Skids, or lugs for attachment of skids shall be secured to container in accordance with the code or rules under which the container is designed and built (with a minimum factor of safety of four) to withstand loading in any direction equal to four times the weight of the container and attachments filled to the maximum permissible loaded weight.

(3) Field welding where necessary shall be made only on saddle plates or brackets which were applied by the manufacturer of tank.

"FIT FOR SERVICE" DESIGNATION

As set out below, certain containers that have a missing name plate may be placed back into service if they meet the following criteria.

(1) All containers with missing name plates must be certified "Fit for Service" using Board approved inspection methodology;

(2) All entities seeking to inspect and designate "Fit for Service" containers must be approved and permitted by the Board;

(3) Storage containers allowed under "Fit for Service" are limited in size from 500w.g. up to 1000w.g. (This limitation does not apply to large bulk storage located at permit holders' bulk plant.); and

(4) "Fit for Service" containers can be used only in the agricultural industry and for the following purposes:

(A) Provide fuel to field irrigation units;

(B) Provide fuel for commercial livestock operations;

(C) Provide fuel for crop drying; and

(D) Other agricultural applications as may be brought before the Board for consideration.

12. TANK TRUCKS CONSTRUCTION AND ASSEMBLY

The following paragraphs, A to Z, inclusive, apply to the construction and assembly of tank trucks used for transportation and delivery of liquefied petroleum gases:

A. Blueprints of the design of all containers to be used on delivery and transport trucks, showing location of pump, meter, fittings, baffles, piping arrangement, mounting details, etc., shall be submitted to the Board for approval before the container is constructed.

B. Each container to be mounted on a delivery truck, transport, or trailer shall be equipped with suitable baffle plates and shall be attached in such manner as to allow for any expansion or contraction of shell plates under internal pressure due to any out-of-roundness. All containers used for transportation and delivery of liquefied petroleum gases shall have the safety valves installed in the top center line of the container shell; and when of the external type, they shall be recessed to a sufficient depth that no part of the valves will extend above the shell of the container. The safety valves shall have direct communication with the vapor space of the container. The safety valve recesses shall be protected from rain and snow with a loose fitting cover. Provisions shall be made to prevent the covers from being held down against the recesses, thus obstructing or decreasing the flow rate of the valve in the event a truck overturns and comes to rest on the top portion of the tanks. If internal type valve is used, the sump or recess may be eliminated provided the distance between the top of the tank shell and the highest point of the valve does not exceed $2^1/2$ inches and that the valve is fully protected by a metal ring of not less than three-Bights (3/8) inch plate material. All safety valves must have sufficient relieving capacity as required by National Board of Fire Underwriters for the size tank on which they are to be installed.

C. Adequate protection consisting of a permanent fixture without hinges shall be provided for all fittings extending above the shell of the container.

Fittings shall not be installed in the ends of the tank between the tractor and the tank on trailers and semi-trailers, but shall be located at the rear or the bottom portion of the container at a distance from the front of the container of not less than one- third (1/3) the length of the container. Fittings such as liquid level gauges (rotary or float), fixed outage gauge, pressure gauge, and thermometer may be located in the side of the container at a distance from the front of the container of not less than one- third (1/3) the container length, providing the fittings are recessed to the extent that no portion of the fittings extends beyond the outer surface of the shell or recess.

D. All piping shall be installed in a straight line as nearly as possible with a minimum amount of pipe, and shall not be restricted by an excessive amount of elbows and bends. The piping between the excess flow valve and the pump shall not be reduced in size. The pipe must be of the same size as the outlet of the excess flow valve. All piping, tubing, and fittings shall be securely mounted and protected against damage and breakage, and shall be at least extra heavy to the first hand shutoff valve. All piping shall be at least extra heavy (Schedule 80) if joints are threaded, or threaded and back welded. At least single strength (Schedule 40) shall be used if joints are welded, or welded and flanged.

E. Fittings located on the bottom of tank trucks, trailers, and semi- trailers shall be adequately guarded and protected from mud and other foreign objects that might be thrown from the roadbed. Twin or multiple installation of tanks on trucks, trailers, and semitrailers shall have flexible connections installed in the liquid and vap manifolds between the tanks. All trucks equipped with a pump shall have a flexible connection between the tank and pump, unless the pump is attached directly to the tank outlet by the use of a flanged connection welded to the container. The flexible connection shall be of an approved type, and where hose is used for this purpose it shall consist of a hose with a minimum bursting pressure of not less than twelve hundred fifty (1250) PSI. There shall be etched, cast, or impressed on the hose at 5 foot intervals, or on a name plate permanently attached thereto, the following information: (See also "Fit for Service" section regarding replacement name plates).

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F. All containers attached to delivery or transport trucks by the use of saddles with metal bands for holding the containers in place shall have belting or other fibrous, resilient material of not less than one- fourth (1/4) inch in thickness installed between the tank and the cradle, or saddle, supports.

G. A safety relief valve shall be installed between each pair of shut off valves on all liquid lines to relieve into a safe atmosphere any excess pressure that may exist. The start-to-discharge pressure shall not be less than 400 PSIG or in excess of 500 PSIG.

H.A hand shut off valve shall be installed as close as possible to the tank on all liquid and vapor lines, and shall be easily accessible to the operator at all times.

I. All manually operated valves on delivery and transport trucks shall be so located that the operator can close them conveniently.

J. Metallic connection shall be made between tank, chassis, axles, and springs.

K. Pumps of suitable design and properly protected shall be provided for all liquefied petroleum gas containers used for delivery purposes and may be driven by the truck motor power take-off or explosion proof internal combustion engine, hand, hydraulic, or explosion-proof type electric motor. The pump shall be equipped with suitable pressure actuated bypass valve permitting flow from pump discharge to pump suction before the pump discharge pressure rises above the safety relief valve setting of the tank being filled. Pump discharge shall also be equipped with a spring-loaded safety relief valve, which shall be set to discharge at a pressure in excess of the setting of the pressure actuated bypass valve at the pump. When pumps are mounted on containers for transport service, they shall be mounted in the same manner as those used for delivery purposes.

L. The pump shall be mounted on the chassis of the truck or trailer at a location where it can be under the observation of the operator while being used.

M. In all cases where the pump extends below the chassis of the truck, it must be adequately protected.

N. All trucks delivering liquefied petroleum gases for domestic use shall be equipped with a suitable measuring device which shall be used to gauge accurately the amount of gas placed in each system, either by meter or by weight. When meters are used, they must be equipped with a constant differential back pressure valve, regardless of make of meter. The spring setting on the valve shall be not more than 15 pounds.

O. The bottom of all containers mounted on delivery and transport trucks in contact with the saddle supports shall be painted with at least two (2) coats of red lead, or its equivalent, before the containers are installed in the saddle supports.

P. All containers used for delivery and transport purposes shall be painted with white or aluminum paint, or any other light- colored paint with equivalent heat-reflective characteristics. The word "FLAMMABLE" shall be painted in red letters at least six (6) inches in height on both sides and rear of tanks. This regulation shall apply to all new installations and to containers now in service when tanks are repainted and relettered.

Q. Dealers shall be required to paint the name of their company, and a company number in letters not less than four (4) inches in height on both sides of trucks and semitrailers.

R. A suitable "stop" or "stops" shall be mounted on the truck, semi-trailer, or trailer, or on the container, in such a way that the container shall not be dislodged from its mounting due to the vehicle coming to a

sudden stop. Back slippage shall also be prevented by proper methods. A suitable "hold down" device shall be provided which will anchor the container at one or more places on each side of the container to the truck, semitrailer or trailer frame so as to minimize loosening caused by vibration.

S. Tank trucks, tank trailers, and tank semi-trailers, shall not be equipped with any artificial light other than electricity. Lighting circuits shall have suitable over-current protection (fuses or automatic circuit breakers); the wiring shall have sufficient carrying capacity and mechanical strength and shall be suitably secured, insulated, and protected against physical damage.

T. Each delivery or transport truck shall be equipped with suitable side lights, tail lights, and stop light.

U. All trailers shall be firmly and securely attached to the vehicle drawing them by means of suitable drawbars. Every trailer or semi- trailer shall be equipped with a reliable system of brakes, and adequate provision shall be made for efficient operation from the driver's seat of the vehicle drawing the trailer. Every trailer or semi-trailer shall be provided with side lights, tail light, and stop light. Four-wheeled trailers shall be of a type of construction which will prevent the towed vehicle from whipping or swerving from side to side dangerously or unreasonably, but will enable it to follow substantially in the path of the towing vehicle.

V. Where a fifth wheel is employed, it shall be ruggedly designed, securely fastened to both units, and equipped with a positive locking mechanism which will prevent separation of the two units, except by manual release.

W. The exhaust system, including muffler and exhaust line, shall have ample clearance from the fuel system and combustible materials. Truck muffler and exhaust pipe shall be placed as far as practicable from any tank valves, pumps, or piping. Muffler cutout shall not be used.

X. Each tank truck and trailer shall be provided with properly attached metal bumpers or the chassis extension shall be so arranged as to protect the tank, piping, valves, and fittings in case of collision.

Y. Tank trucks and trailers owned and operated by dealers holding permits and having previously been approved by the Liquefied Petroleum Gas Board may be allowed to remain in service, but in the event such truck tank or trailer is shopped for major repairs, it shall be equipped to meet all of the requirements of this Code.

16. FARM VEHICLES AND TRAILERS.

The following regulations of this code apply to liquefied petroleum gas containers mounted on trailers or motor vehicles of the farm type used in connection with the transporting of liquefied petroleum gas on the farm and from one farm to another where owned by the same user, and shall not exceed 1,200 water gallon capacity.

Before the Director may grant approval, it will be necessary that each farm user desiring to operate liquefied petroleum gas equipment under the pro- visions of this Section submit to the Board a written report covering the complete phase of the intended operation, and confirm the fact that the conditions under which approval may be granted are thoroughly understood and agreed to by the user.

A. All liquefied petroleum gas containers for use on farm trailers or motor vehicles shall be constructed for a safe working pressure of not less than 250 psi.

B. Four-wheel trailers shall be of a type construction which will prevent the towed vehicle from whipping or swerving from side to side in a dangerous or unreasonable manner but will enable it to follow substantially in the path ofthe towing vehicle.

C. Containers having a water capacity not in excess of 35 gallons may be mounted on two-wheeled trailers, provided the container and trailer is properly balance.

D. All trailers shall be firmly and securely attached to the vehicle drawing them by means of drawbars of the pintle hook type, equipped with a positive locking device which will prevent separation of the two units, and supplemented by suitable safety chains.

E. All trailers shall be equipped with axle and wheel assemblies of sufficient size to support the weight of the container and contents adequately and safely when loaded to capacity.

F. All containers shall be mounted on trailers in such a manner that the bottom of the container will be as close to the ground level as possible, but in no case shall they be over 36 inches above ground level.

G. When containers are placed on trailers that do not have a swivel in front axle to allow for a rocking action when the trailer is moving over rough or uneven ground, the container shall be bolted to the rear axle only and strapped by a band over the top of the tank at both the front and rear of the tank.

H. No container mounted on a farm trailer or motor vehicle shall be permitted on public highways except where necessary for travel from one farm to another, both of which are owned by the user.

I. All hose connections on farm trailers or motor vehicles shall have a hand operated shut-off valve at the tank end of the hose. This shut- off valve shall be attached to an excess flow valve of adequate size: The spring, seat, and poppet valve parts of the excess flow valve shall be inside of the tank or even with the outer portion of the container. In no case shall the working mechanism of the excess flow valve extend beyond the outer shell of the container.

J. All containers mounted on farm trailers or motor vehicles that have a fuel transfer hose attached to the container shall have a bracket attached to them to support the hose properly and keep it from becoming loose and dragging while the trailer is in motion.

K. It will be permissible to use explosion proof 110-volt electric pump, hand pumps, and vapor piston-type pumps on farm trailers and motor vehicles, provided they are adequately protected and securely mounted. Where equipped with a pump, an excess flow valve shall be installed in the tank outlet with a manual hand shutoff valve attached to the excess flow valve. Internal combustion engines of the explosion-proof type may be used for supplying power to the pump provided they are adequately protected and securely mounted.

A flexible connection shall be installed between the tank and pump, unless the pump is attached directly to the tank outlet by the use of a flanged connection welded to the container. The flexible connection shall be of an approved type, and where hose is used for this purpose it shall consist of a hose with a minimum bursting pressure of not less than twelve hundred fifty (1250) PSI. There

shall be etched, cast, or impressed on the hose at 5 foot intervals, or on a name plate permanently attached thereto, the following information: (See also "Fit for Service" section regarding replacement name plates).

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Bursting Pressure
Manufacturer's Name or Trade-Mark Year of Manufacture

M. The piping or connections between the excess flow valve and the pump shall not be reduced in size.

N. The pump shall be equipped with a suitable pressure actuated bypass valve, permitting flow from pump discharge to pump suction before the pump discharge pressure rises above the safety relief valve setting of the tank being filled. Pump discharge shall also be equipped with a spring-loaded safety relief valve.

O. A safety relief valve shall be installed between each pair of shutoff valves on all liquid lines to relieve into a safe atmosphere any excess pressure that may exist. The start-to- discharge pressure shall not be less than 400 PSIG or in excess of 500 PSIG.

P. Containers mounted on motor vehicles of the farm type may be equipped with a pump driven by the power take-off of the vehicle provided the pump does not have a rated capacity in excess of twenty (20) GPM.

Q. Containers mounted on motor vehicles shall be properly anchored to the vehicle in a safe manner. No portion of the tank or fittings shall extend beyond the bed or bumper of the vehicle.

R. Any container mounted on a farm trailer or motor vehicle where transfer of liquid is made from such container into a container used to supply fuel to a stationary engine, tractor, weed burner, or other portable farming device, shall be located not less than thirty (30) feet from any residence or publicly occupied building.

S. Where necessary to travel on a public highway in going from one farm to another, all containers mounted on farm trailers shall be towed by a farm tractor or motor vehicle at a speed not in excess of twenty
(20) Miles per hour. Any motor vehicle having a liquefied petroleum gas container mounted there on shall not be operated at a speed in excess of twenty (20) miles per hour.

T. Any farm trailer or motor vehicle operated upon any public highway or road after dark shall be equipped with clearance lights and a tail light. It is recommended that such travel be made during the daylight hours only.

U. All containers shall be painted with a light heat-reflecting paint, equivalent to white or aluminum and shall have painted on the sides and rear in red letters at least four (4) inches in height the word "FLAMMABLE"- also, in letters two (2) inches in height, the words, "NO SMOKING OR OPEN FLAME PERMITTED WITHIN TEN FEET".

V. No container mounted on a farm trailer or motor vehicle is to be used to transfer liquefied petroleum gas to any container except those used to supply fuel to a stationary engine, tractors, weed burners, or other farming devices owned by the user.

W. The filling or servicing of any container, regardless of type or size, as outlined under the above regulations, which is not under the ownership of the user, is prohibited.

X. All containers used for the purpose of supplying or the transfer of liquefied petroleum gas to farm trailers or motor vehicles shall be under the sole ownership or lesseeship of the user. The transfer of any liquefied petroleum gas to these units from a container owned or operated on a cooperative or partnership basis, or where liquid is withdrawn for resale or redistribution by others, is prohibited.

Y. Commercial storage containers installed at gins, rice dryers, etc., shall not be used to supply or transfer liquid into a farm trailer or motor vehicle unless owned or controlled by the individual user

for his own personal operation.

Z. A report of all containers installed on farm trailers or motor vehicles shall be made to the Board upon completion of the installation, together with a report signed by the farm user, to the effect that he thoroughly understands and agrees to the condition under which he will be permitted to operate this equipment It will be the user's responsibility that each employee operating this equipment has a thorough knowledge of the regulations governing this operation.

17. STORAGE CONTAINERS:

(The words "Storage Containers" shall be construed to mean all vessels used for bulk storage and commercial storage of liquefied petroleum gases.)

~~The use of a railway tank car as a bulk storage container is prohibited and the transferring of liquefied petroleum gases from a railway tank car into delivery trucks, trailers, or semi-trailers is strictly prohibited. The gas must be transferred directly into adequate and approved bulk storage containers as outlined in the following paragraphs~~:

A. Containers used for bulk storage, and commercial storage vessels located at cotton gins, rice dryers, schools, hospitals, bottle filling plants, etc., having a capacity of twelve hundred (1200) water gallons, or over, shall be located not less than fifty (50) feet from the nearest important building or group of buildings or line of adjoining property which may be built on. They shall not be less than fifty (50) feet from main line or passing track of a railroad, or public highway. Waiver of this requirement may be made by the Director providing no undue hazards exist, but in no case shall they be located closer than twenty-five (25) feet, regardless of size of the container. EXCEPTION: Bulk storage containers used for the transferring of liquefied petroleum gases into delivery trucks shall be not less than four hundred (400) feet from any school, hospital, or other place of public assembly.

B. Storage containers shall be provided with substantial reinforced concrete footings and foundations and shall be mounted on saddles in such a manner as to permit expansion and contraction. Every container shall be so supported as to prevent the concentration of excessive loads on the supporting portion of the shell. Suitable means of preventing corrosion shall be provided on that portion of the container in contact with the foundation or saddles. There shall be a resilient cushion of road expansion, or other suitable material placed between the saddle and tank to allow for minor imperfections in pier surface, to protect the tank from corrosion and to act a lubricant in tank expansion and contraction. That portion of the tank surface that is to be in contact with the pier, or saddle, shall be painted with at least two (2) coats of red lead, or its equivalent, before installing on the supports. Blueprints of approved-type footings, and foundations may be obtained from the Board upon request. EXCEPTION: Containers used for storage of Propane gas, not exceeding 2500 water gallon capacity, and containers used for storage of Butane gas, not exceeding 3000 water gallon capacity may be mounted on prefabricated concrete blocks, providing the design has been reviewed and approved by the Director prior to installation.

C. Storage containers shall be equipped with the necessary safety relief valves as outlined in the latest edition of Pamphlet No. 58, National Fire Protection Association, and shall have direct communication with the vapor space of the container. The discharge from the safety relief valve shall be upward and unobstructed to the open air.

D. Safety relief valves shall be so arranged that possibility of tampering will be minimized: if pressure setting or adjustment is external, the relief valve shall be provided with approved means for sealing adjustment.

E. No shut-off valve shall be installed between the safety relief valves and the container.

F. Loose-fitting caps, or covers, shall be placed over the safety valves to prevent rain or other substance from entering the valves.

G. Storage containers of all types shall be equipped with suitable ground wire, excess flow check valves in the liquid and vapor outlets, liquid level gauging device, safety relief valves, and vapor pressure gauge graduated to not less than one and one-half (1 1/2) times the designed working pressure of the container, but need not exceed 300 PSI. The coupling for the excess flow check valve and vapor return valve on containers of 1200 gallons capacity, and over, shall be not less than one and one-fourth (1 1/4) inches standard pipe size. All piping shall be wrought iron or steel and shall be at least extra heavy to the first hand shut-off valve. All piping past the first hand shut-off valve shall be at least extra heavy (Schedule 80) if joints are threaded, or threaded and back welded. At least single strength (Schedule 40) shall be used if joints are welded, or welded and flanged. The use of cast iron plugs or fittings is prohibited. Stop valves shall be placed as near the

outlet as possible on all liquid and vapor lines. The piping leading to and from the excess flow check valves shall be sufficient in size to prevent pressure drops reaching the point where the excess flow check valve would not function, and in no case shall such piping be reduced in size between the check valve and the first hand shut-off valve, but must be equal to, or greater in size than that of the excess flow check valve outlet.

(1). Each LP-gas stationary storage installation of 6,000 gallons or more, aggregate capacity, installed on or after July 1, 1993, shall incorporate in its design bulkheads and emergency shutoff valves (ESVs) for liquid and vapor transfer systems. NOTE: This section shall not apply where the liquid transfer hose is connected directly to a 13/4 inch or less acme-threaded filler valve when such valve is installed directly into the container.

(2). Bulkheads shall be of concrete or steel and anchored sufficiently to prevent displacement of piping and fittings in the event of a truck pull-away while the transfer hose is connected.

(A). Piping through a bulkhead shall be secured to the bulkhead to prevent shifting. Piping shall terminate through the bulkhead with a Schedule 80 pipe collar and a 12 inch length of Schedule 80 pipe and forged steel elbow between the bulkhead and hose coupling.

(B). Bulkheads shall not be less than 10 feet from a container. (3). Emergency shutoff valves

(ESVs) shall be installed
in fixed piping of the transfer system upstream of the bulkhead and within four feet of the bulkhead with a flexible wire braided hose not more than 24 inches installed between the ESVs and the bulkhead.

(A).ESVs shall be installed according to the manufacturer's instructions.

(B). ESVs shall incorporate all of the following means ofclosing.

(1). automatic shutoff through thermal (fire) actuation using fusible elements with a melting point not to exceed 250F;

(2). manual shutoff at the installed location; and

(3). manual shutoff from a remote location. Remote controls shall be connected to each ESV. Emergency remote controls shall be conspicuously marked and shall be located and maintained to be readily accessible in emergencies.

(4). Where the flow of LP-gas is in one direction only, a backflow check valve may be used in lieu of an ESV in the fixed piping, provided that the back-flow check valve has a metal-to-metal seat or a primary resilient seat with a secondary metal seat not hinged with combustible material.

(5). ESVs or back-flow check valves shall be installed in the piping system in such a manner that any break resulting from a pull-away will occur on the transfer hose side of the bulk- head and the valves and piping on the container side of the bulkhead will remain intact.

(6). The bulkhead(s) and ESV's must be kept in proper working order at all times in accordance with the manufacturer's instructions.

See Diagrams on page ~~97~~ 96.

H. A safety relief valve shall be installed between each pair of shut-off valves on all liquid lines to relieve into a safe atmosphere, any excess pressure that may exist. The start-to-discharge pressure shall not be less than 400 PSIG or in excess of 500 PSIG.

I. All bulk storage containers, regardless of size and containers used for fuel purposes such as mounted on automobiles, trucks, buses, tractors, or other mobile or portable equipment, regardless of size, and all commercial and industrial storage containers exceeding 1200 water gallon capacity shall be equipped with individual fittings: the use of domestic compact head and fittings is prohibited.

J. Where two or more containers are connected rigidly together in a battery, provisions shall be made in all liquid and vapor manifolds for the expansion or contraction of the vessels or piping.

K. The operator shall be in attendance at all times while the container, regardless of type, is being loaded or unloaded: the operator shall

be stationed close to point of cutoff at all times during filling or un- loading operation.

L. Each opening in container exceeding a No.54 drill size, except safety relief valves and gauging devices of the float, or equivalent type which do not require flow for their operation, shall be equipped with an excess flow valve or its equivalent.

M. The welding or brazing of any malleable fitting is prohibited.

N. All pipe and fittings subjected to tank pressure where buried under- ground shall be at least extra heavy (Schedule 80).

O. The installation of any storage container underground, or the covering of any storage container with a mound of earth, or other material, except containers designed to operate under refrigerated or cryogenic conditions, is prohibited.

P. Gauge glasses of the columnar type shall be restricted to filling plants where the fuel is withdrawn in the liquid phase only. They shall be equipped with valves having metallic handwheels, with excess flow valves and with extra-heavy glass adequately protected with a metal housing applied by the gauge manufacturer. They shall be shielded against the direct rays of the sun. Gauge glasses of the columnar type are prohibited on truck tanks, motor fuel tanks, and on containers used in domestic, commercial, and industrial installations.

Q. Any container where transfer of liquids is made from such container into portable container such as tractors, skid tanks, and motor fuel tanks, shall be located not less than thirty (30) feet from any residence or publicly occupied building. This does not include DOT cylinders, as they must be filled by weight at approved filling stations in compliance with Section 10, Par. C., and located in compliance with Par. A. of this Section.

R. Storage containers shall be painted at the time of installation with white or aluminum paint, or any other light colored paint with equivalent, heat-reflective characteristics, and shall have painted on both sides and both heads where readily visible the word "FLAMMABLE" in red letters at least six (6) inches in height. Warning signs with the following words, "No Smoking Or Open Flame Permitted Within Ten (10) Feet", shall be painted on the container or a sign adjacent to the container in letters of at least one and one-half ($1^1/2$) inches in height, in black or red, on a white or aluminum background. Where considered necessary by a representative of the Board, containers shall be adequately protected by a suitable guard rail to protect vessel from moving vehicles or objects, a fence, or provisions made for locking the service line valves to prevent pranksters or prowlers or unauthorized persons from opening the valves, allowing gas to escape. The premises around the container shall be maintained in good order. Combustible matter of any type shall not be allowed to accumulate near the container.

S. Electric motors and switches or internal combustion engines used in connection with compressors or pumps for loading and unloading at bulk plants shall be explosion-proof type.

T. All containers used for domestic and commercial purposes and first stage regulating equipment shall be located outside of buildings, other than those especially provided for this purpose, except DOT cylinders which may be used indoors under the following conditions:

(1) If temporarily used for demonstration purposes and the container has a maximum water capacity of 12 pounds.

(2) If used with a completely self-contained gas hand torch or similar equipment, and the container has a maximum water capacity of $2^1/2$ pounds.

Where portability of containers is necessary, making their location outside the building or structure

impracticable, DOT Cylinders having a capacity not in excess of 30 water gallons may be located for use but not for storage inside the building or structure under the following conditions

(1) Where gas is used for industrial processing or repair work in an industrial building or structure being employed for industrial purposes.

(2) Where temporarily used in the construction, repair, or improvement of buildings or structures and their fixtures and equipment.

(3)Provided regulator is attached directly to the cylinder valve or to a manifold connected to the cylinder valves and that no more than three (3) cylinders are connected to any one manifold, in any one room unless separated by atleast fifty (50) feet.

(4) Cylinders shall not be located or used where exposed to possible excessive temperature, physical damage or tampering by unauthorized persons, and shall be removed to the outside when not in use.

Each individual container shall be located with respect to the nearest important building or group of buildings, or line of adjoining property which may be built on in accordance with the following table:

EXCEPTION: - DOT cylinders of 30 water gallon capacity, or less.

	Minimum Distances		
Water Capacity Per Container	Container Under-Ground	Container Above Ground	Between Above Ground Containers
Less than 125 Gallons	10 Feet	10 Feet	1 Foot
125 to 500 Gallons	10 feet	10 Feet	3 Feet
501 to 1200 Gallons	25 Feet	25 Feet	3 Feet
1201 to 30,000 Gallons	50 Feet	50 Feet	5 Feet
30,001 to 70,000 Gallons	50 Feet	75 Feet	1/4 of Sum of diameters of adjacent containers
70,000 to 100,000 Gallons	50 Feet	100 Feet	

The distance between liquefied petroleum gas containers and any anhydrous ammonia container shall be not less than 25 feet. No liquefied petroleum gas container except containers designed to operate under refrigerated or cryogenic conditions and containers located at marine or pipe line terminals shall exceed 90,000 Standard U.S. Gallon capacity. Containers located at marine or pipe line terminals not designed to operate under refrigerated or cryogenic conditions shall not be in excess of 100,000 water gallon capacity.

No liquefied petroleum gas container in excess of 30,000 water gallon capacity shall be installed prior to approval by the Board

Containers that have been in use for the storage of anhydrous ammonia shall not be used for the storage of liquefied petroleum gases unless that container has been completely emptied and made free of all anhydrous ammonia. The container shall be completely refitted in accordance with the rules and regulations of this Code.

Flexible hose for use with liquefied petroleum gases shall consist of a hose with a minimum bursting pressure of not less than twelve hundred fifty (1250) PSI. There shall be etched, cast, or impressed on the hose at 5 foot intervals, or on a name plate permanently attached thereto, the following information: (See also "Fit for Service" section regarding replacement name plates).

L.P.G.
Bursting Pressure Manufacturer's name or trademark
Year of manufacture

U. Each storage container used in connection with a service station operation not exceeding 1200 water gallon capacity shall be located not less than twenty-five (25) feet from any building, group of buildings and adjoining property lines which may be built upon. Storage containers in excess of 1200 water gallon capacity shall not be located closer than fifty (50) feet in relation to the above.

V. Readily ignitable material including weeds, dry grass, etc., shall be removed within ten (10) feet of the container. Where quantity of combustible material is large, it may be necessary that the distance between the container and material exceed ten (10) feet.

W. The minimum distance between LP-Gas containers and flammable or combustible liquid tanks or containers shall be not less than twenty (20) feet.

X. No bulk or commercial storage container shall be installed or moved and reinstalled at any location prior to approval by the Director.

Y. Railcar to cargo tank transfer (commonly called Transloading) is allowable under the following conditions:
(1) Installation must be done in accordance with NFPA58 guidelines;
(2) Installation is limited to twenty-four (24) months and must be approved by the Board;
(3) A Class 8 Permit must be obtained; and
(4) Annual inspections must be conducted.