AR Doc # 1759

NEW MEXICO
HEALTH AND ENVIRONMENT
DEPARTMENT

ENVIRONMENTAL IMPROVEMENT DIVISION
Harold Runnels Bldg.-1190 St. Francis Drive
Santa Fe, New Mexico 87503

Richard Mitzelfelt
Director

GARREY CARRUTHERS
Governor

CARLA L. MUTH
Secretary

MICHAEL J. BURKHART
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

[redacted]

Lt. Nicholas W. Muszynski
Wing Environmental Management Division
1606 ABW/RMX
Kirtland AFB, New Mexico 87117-5300

Dear Lt. Muszynski:

This is in response to the notice of intent for Kirtland AFB which was received by the Environmental Improvement Division (EID) of the Health and Environment Department on December 30, 1989. Your notice has been reviewed by the EID, and you are hereby notified that a discharge plan is required for your existing base fuel farm located on Kirtland AFB in Bernalillo County, New Mexico. This notification is based on EID's finding pursuant to the New Mexico Water Quality Control Commission Regulations (Regulations), copy enclosed, that effluent or leachate from your facility may move directly or indirectly into ground water.

Enclosed is a discharge plan application form. Please complete the form and submit it to the Program Manager of the EID Ground Water Section. Dennis Slifer has been assigned the technical review of your discharge plan. He will correspond with you directly, if additional information is needed to complete his review.

The filing of plans and specifications is required under Section 1-202 of the Regulations. Plans and specifications are to be filed with the EID district engineer, who is located at EID District I office; 4131 Montgomery Boulevard, N.E., Albuquerque, New Mexico 87109, ATTN: Lee Rosenberger, telephone 841-6584. A copy of the notice of intent you submitted to this office is being forwarded to that EID office.

As noted in Section 3-106.A. of the Regulations, the discharge plan shall be submitted to the EID within 120 days of receipt of this letter. If this deadline places undue constraints on a discharger, a written statement showing good cause shall be submitted to this office with a request for a deadline extension.

KAFB4335

Please call Dennis Slifer directly at 827-2936 if you have any questions.

Sincerely,

Stuart P. Castle

Stuart P. Castle
Bureau Chief
Ground Water Bureau

SPC/DS/mw

cc: Tito Madrid, EID District I Manager, Albuquerque

Enclosure

AR Doc # 1762

Fuels 16-75-2

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 1606TH AIR BASE WING (MAC)
KIRTLAND AIR FORCE BASE, NEW MEXICO 87117-5000

REPLY TO ATTN OF: LGSF

2 March 1989

SUBJECT: Water Draining from JP-4 Tanks

TO: 1606 ABW/EM

1. The following information is provided concerning the draining of water from the low point drains in tanks 2420 and 2422.

a. All low point tank water is removed using the eight(8) fixed product recovery systems. These systems allow removal of water only, and permit returning the fuel to the tank.

b. The low point water removed from the tanks averages 5 gallons per system per week; for a total of (5x8x52)= 2080 gallons per year. (Based on the precipitation and the amount of entrained water, the actual amount varies weekly, but the 5 gallons per system per week is very close to the total amount.)

2. The enclosed attachments provide basic information. Detailed drawings or plans might be obtained from the Base Civil Engineering Squadron.

Douglas W Morgan Jr.

DOUGLAS W. MORGAN JR., GS-11, USAF
Chief, Fuels Management Branch

3 Atch
1. Tank Information
2. Water Drain Information
3. T.O. 37-1-1

Atch 2

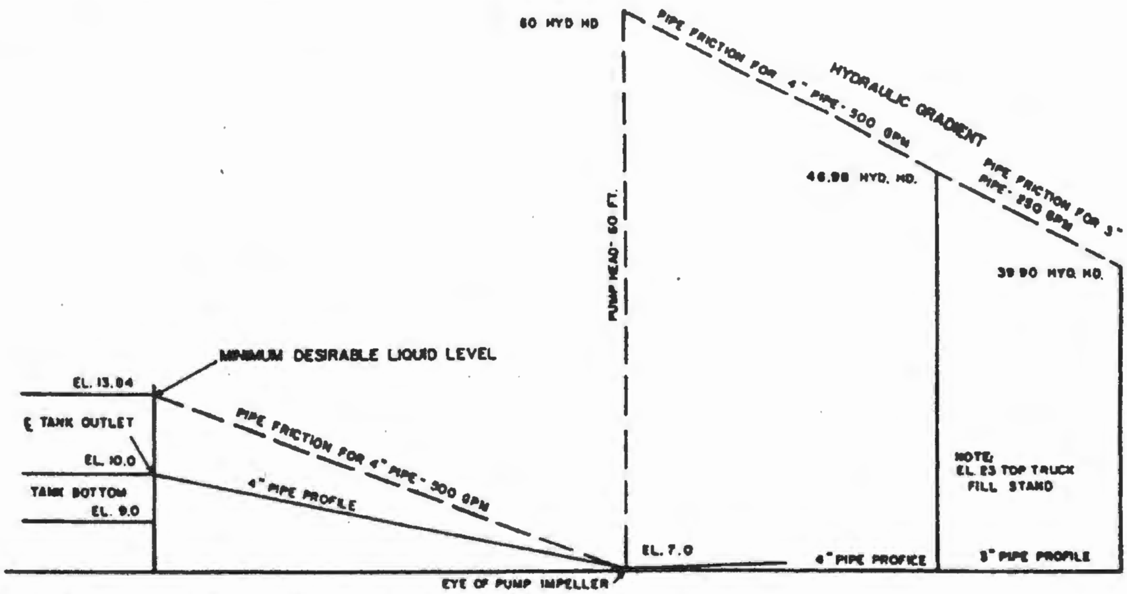


Figure 2-7. Example of Hydraulic Gradient.

Section C—Bulk Storage and Operating Storage

★2-6. General Information. The majority of the above-ground storage tanks for Air Force petroleum products are built according to American Petroleum Institute (API) Specifications and Air Force Standard Design. Belowground horizontal cylindrical storage tanks up to 30,000 gallons are usually built according to National Bureau of Fire Underwriters (NBFU) specifications. Belowground horizontal cylindrical operating storage tanks over 30,000 gallons capacity are built according to Air Force Standard design. Under proper conditions, such tanks are also satisfactory for bulk storage. Aboveground steel tanks are of cylindrical design (vertical or horizontal) and of all-welded construction. Belowground vertical cylindrical tanks are built according to Air Force standard design. Water bottoms are not permitted in petroleum storage tanks. Existing jet fuel tanks without provisions for daily water removal are modified to provide a low point or sump (several sumps around outer portion of bottom for large diameter vertical tanks) to accumulate water settling out of the fuel. A drain valve for aboveground tanks and portable pumps for belowground tanks will be provided for daily water removal. Drain valves will be provided with a lock and will be kept closed except when water is being drained. Current criteria for above- and belowground bulk storage tanks storing aviation fuels require installed a product recovery system at the water draw-off value of the tank. See AFM 88-15. They should also be programmed for installation on existing facilities. See figures 2-8 and 2-9. Motorized models should only be used when an electrical power source is readily available and the additional cost can be justified. The hand-operated model must be used on all other installations. Product recovery systems are not required on ground product bulk storage tanks (diesel, heating fuels, etc.); however, it may be desirable to have such a system installed on bulk motor gasoline (MOGAS) storage tanks. This system should only be installed on aboveground bulk MOGAS storage tanks with a capacity of 2,000 barrels or larger. Approval must be obtained from the MAJCOM liquid fuels engineer before installing this system. If local environmental pollution laws require a product recovery system to be installed on ground product bulk tanks, other than the MOGAS tanks, installation approval must be granted to HQ AFESC/DEMM through the proper MAJCOM channels. Operating instructions are contained in TO 37-1-1.

NOTE: Hydraulic displacement aqua systems are not used for the storage and dispensing of jet fuels.

2-7. Types of Tanks. Tanks used for petroleum products are:

a. Aboveground:

(1) Floating Roof. Figure 2-10 is a cutaway view of an open-top, pontoon-type, floating roof tank. Figures 2-11 and 2-12 show the current standard design cone roof with internal floating pan tank. These types of tanks are in general use for storage of light-weight volatile liquids and jet fuels. The tank is designed to decrease vapor space over the stored liquid. The problem of rainfall or melting snow accumulating on the top roof deck of the open-top floating roof tank is solved by sloping the roof to a center sump. The sump is connected to a hose or multijointed pipe extending through the fuel to an outside water drawoff valve. The installation of aluminum fixed roofs over open top type floating roof tanks is recommended where excessive water contamination of fuel is a serious problem in areas of high rain and snowfall. For maintenance require-

ATCH 2

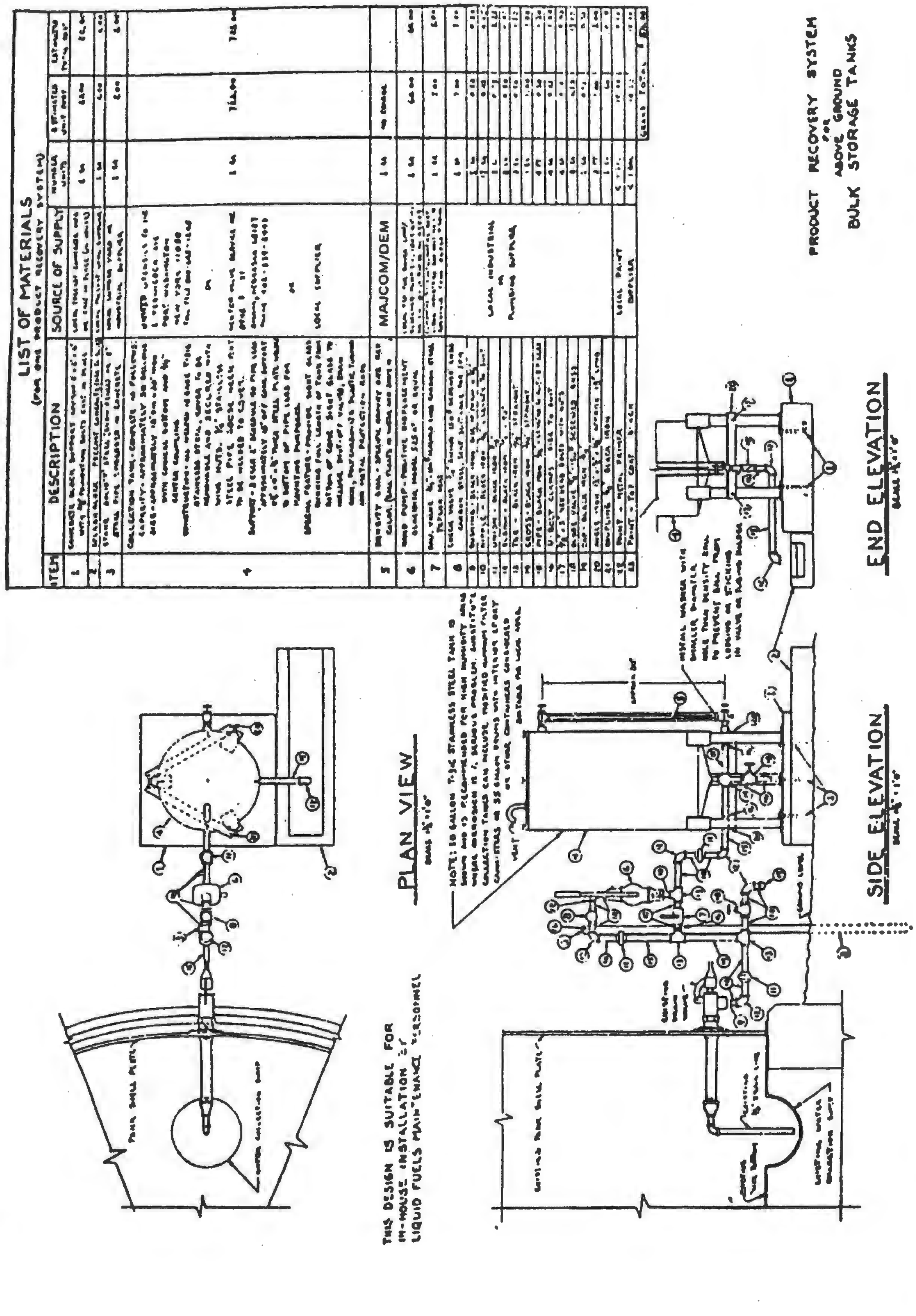


Figure 2-8. Product Recovery System (Hand-Pump Model).

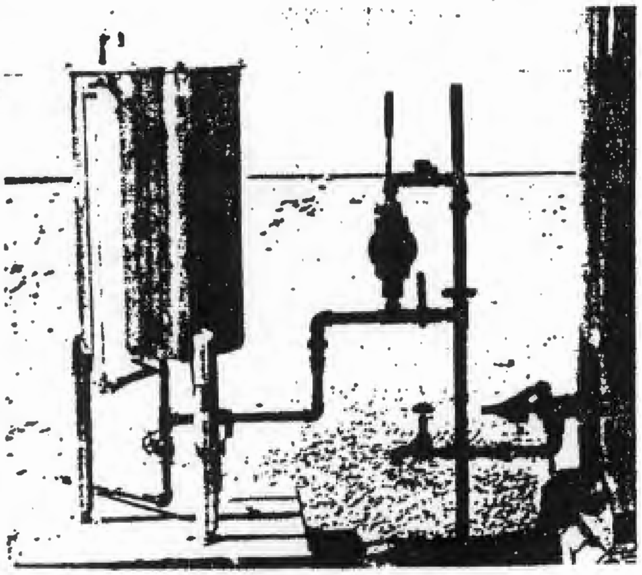


Figure 2-9. Product Recovery System.

ments and responsibilities see paragraph 10-9b(4)(c). For all new construction, the cone roof tank with internal floating pan (see figures 2-11 and 2-12), or cone roof modified with an aluminum floating roof or pan, are the only approved tanks for storage of JP-4 jet fuel, because the hazardous vapor space present in cone roof tanks is eliminated. Also the floating roof or pan provides a ready path for eliminating a static charge. Until the floating roof or pan lifts clear of its legs, the same operational precautions for JP-4 jet fuel storage must be followed.

(a) Effective Seal. The efficiency of an open top floating roof, in preventing evaporation losses and entrance of precipitation and in reducing the possibility of rim fires, depends largely on the effectiveness of the seal closing the space between the rim of the roof and the tank shell. If the seal does not prevent the escape of vapor within the rim, space evaporation will occur. The sealing ring must fit the tank shell snugly. The type of seal in general use with the open top floating roof tank has a continuous, steel ring with vertical flexures about 22 inches apart (see figure 2-13c). A continuous, gastight, weatherproof, synthetic-rubber-coated fabric closes the space between the sealing rim and the rim of the roof. The sealing rim is supported and held firmly but gently against the tank shell by pantograph hangers. Because these hangers apply a uniform, outward radial pressure at each flexure in the sealing ring, they tend to keep the roof property centered in the tank. The sealing ring and fabric seal should be inspected as outlined in chapter 10 for evidence of warping or tank circumference due to settling of the tank or other conditions likely to cause the seal to leak. (In freezing weather, the seal must be kept free of ice. The moderate use of calcium chloride crystals is permitted at the discretion of the base civil engineer). The sealing ring must be free of the tank shell during filling as well as during removal of fuel from the tank. Open top floating roof seals are also of the type shown in figure 2-13A. Seals for the cone roof tanks that have been converted with the floating plan "floater" usually have the type of rim seal shown in figure 2-13B.

(b) Automatic Float Gage. Figure 2-14 illustrates the type of gage used on an open top floating roof tank. The gage is actuated by a float in a well in the deck. The float is connected to the gage tape by a $^{1}/_{16}$-inch stainless steel cable. By connecting the float to the cable with a turnbuckle, it will be possible to make quick adjustments for overreading or underreading. (Lengthen the cable for underreading, shorten the cable for overreading.) The tape is counterweighted, and both tape and counterweight are enclosed in a weatherproof housing. The tape is read through a window. The newer type gage head (figure 2-15) incorporates a spring-actuated storage sheave to take up the tape instead of counterweights; the tape is passed over a sprocket sheave, that registers the liquid level in the tank on counterwheels for a more accurate reading.

(2) Cone Roof. The cone roof tank is designed for aboveground storage but is not as satisfactory as other types for storage of petroleum products because of high evaporation losses due to the transfer of heat from the sun's rays to the stored fuel. The cone roof tank is not recommended for storage of jet fuel and will only be used for such storage when floating roof type tanks are not available. (If these tanks are used for storage of JP-4 or AVGAS, they must have a floating pan installed or programmed. Also check local EPA requirements.) The vapor space in the tank would probably be in the explosive range at normal temperatures. Static charge tends to collect on free liquid surfaces such as those found in the cone roof tank. If the static charge builds up to a sparking potential under these circumstances, an exposion can occur.

(3) Horizontal Cylindrical. In figure 2-16 horizontal cylindrical tanks without pressure are sued for aboveground bulk as well as belowground operating storage. These tanks are of 25,000 and 50,000 gallons capacity. However, new design criteria limits the operation storage tank size to 40,000 gallon maximum. They are equipped with direct-reading gages and have provision for stick gaging to determine fuel level in the tank. Figure 2-16 illustrates a horizontal cylindrical tank.

b. **Belowground:**

(1) Horizontal Cylindrical. As noted in paragraph 2-7a the horizontal cylindrical tank is also used for belowground storage.

(2) Concrete. Concrete storage tanks are some-

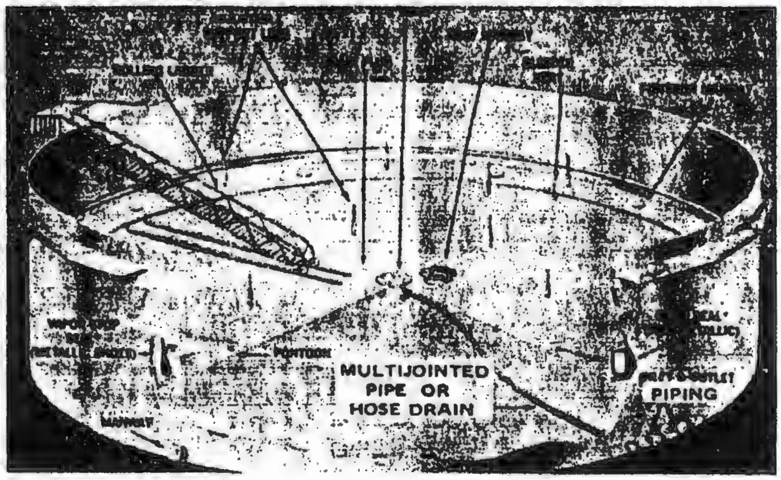


Figure 2-10. Uncovered Floating Roof Storage Tank (Pontoon type).

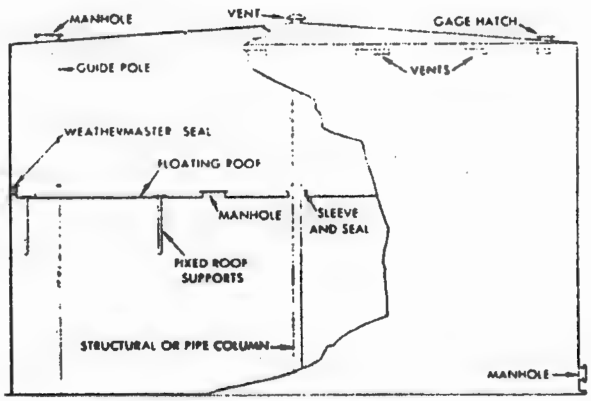


Figure 2-11. Cone Roof With Internal Floating Pan Storage Tank (Steel or Aluminum Pan) (Interior View).

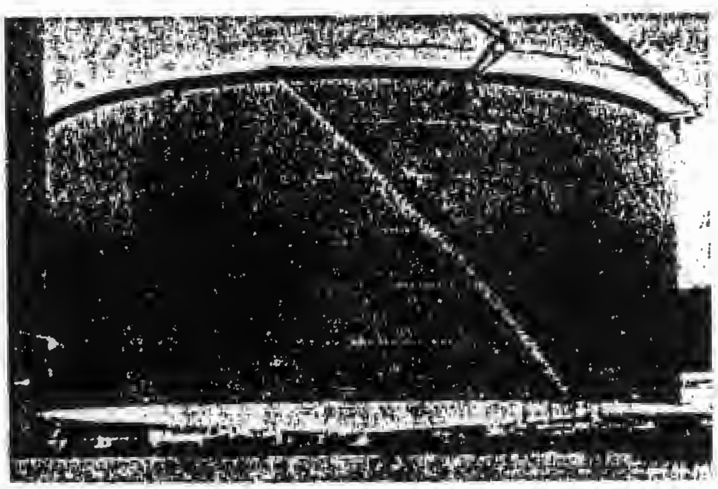


Figure 2-12. Cone Roof With Internal Floating Pan Storage Tank (Exterior View).

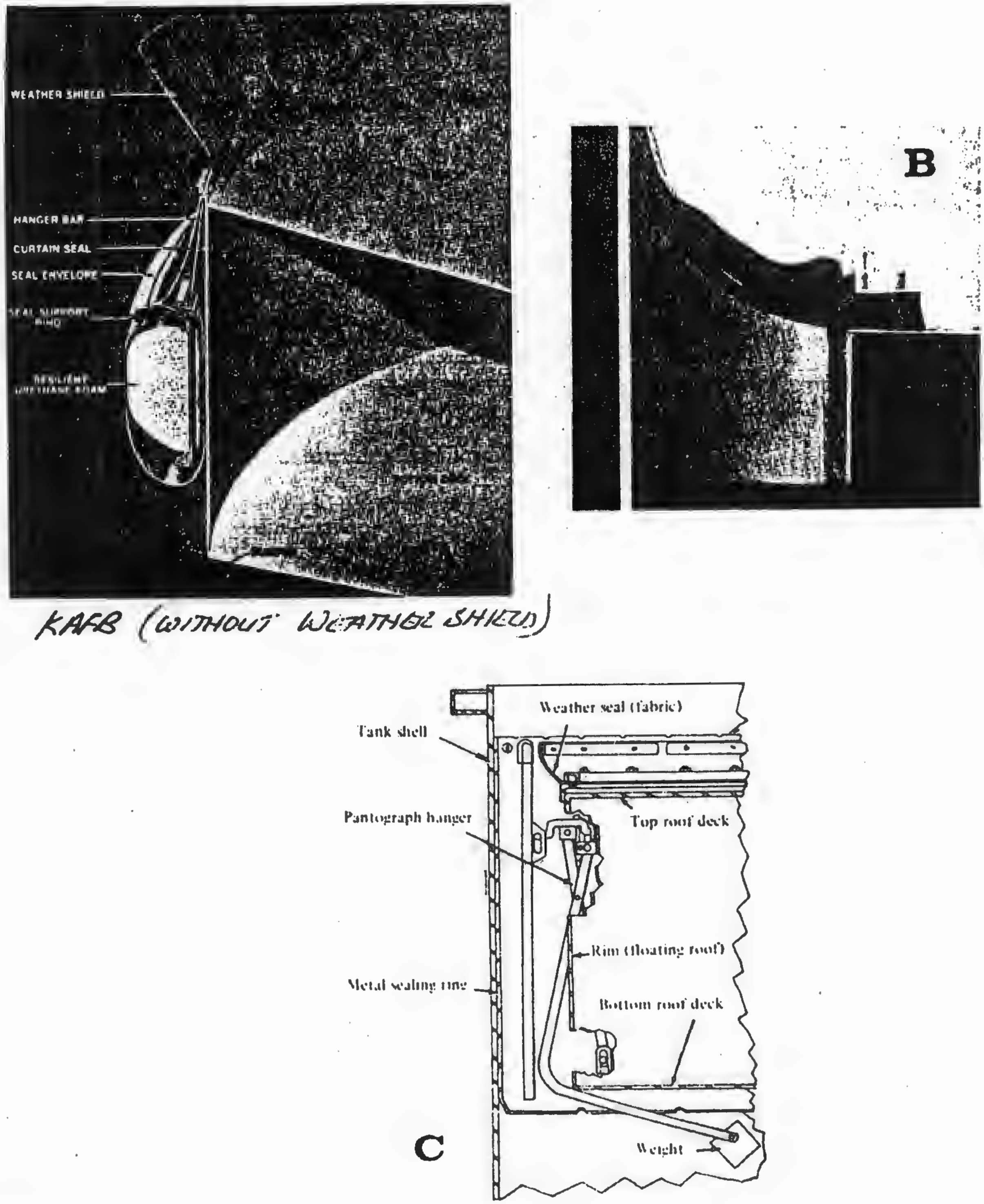
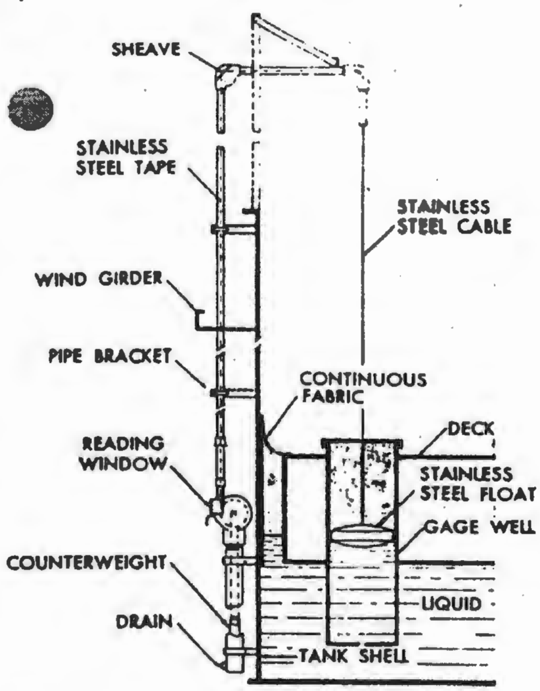


Figure 2–13. Typical Seals Used With Floating Roof Storage Tanks.

times used for belowground storage of petroleum products. Concrete storage tanks required by the Air Force will either be steel lined, and therefore, used and maintained the same as any steel tank or lined with an organic protective coating system approved by HQ AFESC/DEMM.

2-8. Maintenance of Storage Tanks:

a. **Aboveground.** All aboveground storage tanks are carefully selected and maintained to prevent losses because of evaporation of the product. Evaporation seriously affects the quality of the product.

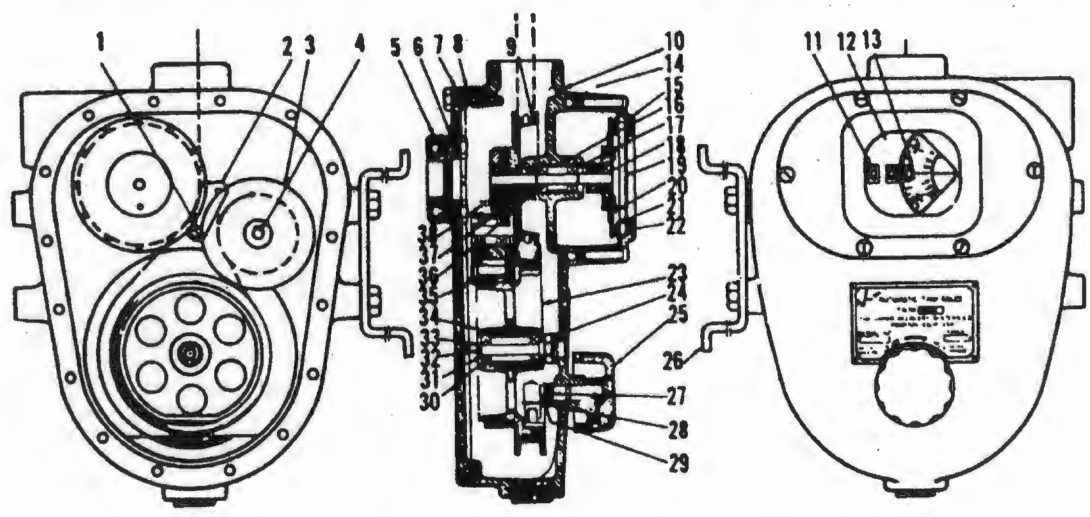


igure 2-14. Automatic Float Gage.

When evaporation takes place, the lighter components with higher vapor pressure excape more readily. It is these fractions that provide easy staring and antiknock properties so essential in modern fuel. When they are lost, a product of inferior quality remains. General maintenance of aboveground storage tanks can be roughly divided as follows:

(1) Maintenance of exterior surfaces of tank components, piping and equipment, including periodic inspection for corrosion and repainting as required. Only touch-up painting is done by liquid fuels maintenance personnel; overall painting is usually done under contract (see chapter 9, section D).

(a) One repainting contract for an aboveground, flat bottom tank, the exterior shell (started 5 feet above the tank bottom) and all stairways, ladders, platforms and appurtenances, must be painted after proper surface preparation according to AFM 85-3, with a primer coat, plus one coat (using contrasting colors), and a final overcoat colored white. The lower 5 feet of the exterior shell (including all stairways, ladders, platforms, and



1. Machine screw
2. Guide, tape
3. Motor storage sheave
4. Shaft, motor storage sheave
5. Cap
6. Gasket, cap
7. Back cover
8. Gasket, back cover
9. Sprocket sheave assembly
10. Case
11. Counter assembly
12. Mask
13. Pinion
14. Gasket, counter cover
15. Cover, counter
16. Spacer, counter drive shaft
17. Ball bearing
18. Shaft, counter drive
19. Glass, counter
20. Dial plate assembly
21. Clip, glass mounting
22. Gasket, glass
23. Sheave, tape storage
24. Support, drive shaft
25. Knob, tape tester
26. Bracket, mounting
27. Spring, gage check
28. Gage check subassembly
29. Pin, stop
30. Ring, locking
31. Washer
32. Shaft, tape storage sheave
33. Ring, locking
34. Spacer, tape storage sheave
35. Spring motor assembly
36. Spacer, seal
37. Seal
38. Pin

'igure 2-15. Automatic Float Gage Head.

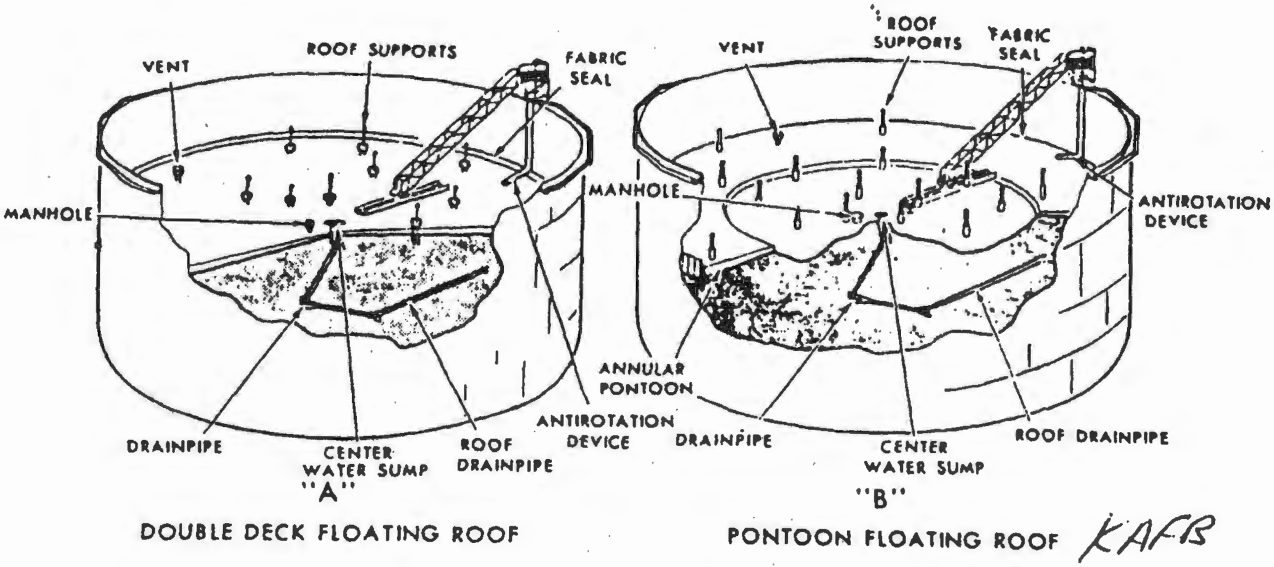


Figure 3-3. Two Styles of Above Ground Floating Roof Tanks

Floating Roof Tanks. Most of the newer tanks are of the floating roof design, which allows the roof to rise and fall with the level of the fuel [Figure 3-3]. Since the roof rests directly on the surface of the fuel, there is little or no space in which fuel vapors can form. This not only reduces the amount of fuel evaporation loss, but greatly minimizes the danger of explosion and fire. These tanks have several noteworthy features, including a roof drain to draw-off rainwater and a flexible fabric seal around the roof rim to help keep the weather out and reduce evaporation loss. An antirotation device prevents circular rotation of the roof and damage to the roof drain piping. Roof vents allow the tank to breathe and roof supports (6-foot legs) hold the roof off the tank bottom when the tank is empty. On the roof of the tank is a gauging hatch for measuring the depth of the fuel in the tank.

Fixed Roof Tanks. Older above ground tanks are of fixed or cone roof design [Figure 3-4]. These tanks are susceptible to high evaporation losses due to the space created between the underside of the roof and the surface of the fuel as it decreases. Because of the highly volatile nature of fuel vapors, you shouldn't store jet and other light weight fuels in these tanks.

Above ground tanks should have concrete or asphalt covered earthen dikes to prevent erosion. The dike floors slope to the dike drain to permit the free flow of water. Tank sizes determine dike sizes. For a single tank the dike must be able to hold 100% of the contents and maintain a 12-inch freeboard. For multiple tanks, it must be able to hold 100% of the largest tank and 10% of the rest.

ATCH 1

f. Another 1/4 inch decrease in volume confirms a leak.

g. Notify installation Civil Engineer, Bioenvironmental Engineer and Safety Office of all confirmed leaks.

h. In the remarks section of the AFTO 39 indicate tank number, date isolation started, and results.

i. Fuel pipeline will be pressure-tested by Civil Engineers.

3-13. PRODUCT RECOVERY SYSTEM AND OIL/WATER SEPARATOR.

a. Operate the product recovery system as follows:

WARNING

Operation of product recovery and water drain system will be constantly attended by a qualified fuels operator and/or a Liquid Fuels Maintenance man.

(1) Unlock the water draw-off valve and position valves to allow flow into recovery tank.

(2) Allow a sufficient quantity of liquid to drain into the recovery tanks to insure water has been removed from the tank sump.

(3) Allow water to settle in water recovery tank; noting sight glass, drain off all water.

(4) Position appropriate valves and transfer all drained fuel to bulk storage.

(5) Close all valves which were opened.

(6) Secure system.

b. Operate the oil/water separator as follows:

(1) Position oil skimmer so siot is level with top of water in the separator to properly separate fuel from water.

(2) Open the gate valve of the separator pit.

(3) Insure only fuel is flowing into the relief tank from the oil skimmer.

(4) Regulate water flow as required.

(5) Close the gate valve when water flow has stopped.

(6) Water will be drained into the base industrial water system for disposal.

3-14. TANK CLEANING AND INSPECTION CRITERIA.

a. The FMO must be aware of the tank inspection and cleaning requirements., Figure 3-3 provides that guidance. Unusual conditions or requirements will take precedence over the chart in figure 3-3. Sample in accordance with T.O. 42B-1-1 and T.O. 42B1-1-16 for Special Fuels.

b. Tank inspections/cleanings will be scheduled according to figure 3-3. Minor deviations in frequency of tank inspections because of non-availability of tank-cleaning personnel or a bioenvironmental engineer, receipt problems, etc., are permitted for up to 45 days. Periods in excess of 45 days must be approved by the MAJCOM Fuels Officer/Civil Engineer. Those locations which have large amounts of dormant storage and cannot rotate the product to empty tanks due for inspection without severe operational problems, can request a time extension from their Command Fuels Officer/Civil Engineer, provided fuel sample results are satisfactory.

3-15. SERVICING CONTROLS. Servicing controls are required to assure the correct grade of fuel is issued by refueling units. Refueling units must be filled with the correct fuel, and the right unit must be used to dispense the fuel to the aircraft/equipment. Quick-disconnect couplers (such as Kamlok or equivalent) should not be used in permanently installed fillstands. If quick-disconnect couplers are required by T.O. on portable fuel systems, they will be safety-wired. The use of selective couplers for bottom loading of avfuel refueling units from fillstands is mandatory at all Air Force bases including Air Force Reserve and Air National Guard. If mission support requires retention of top loading, approval will be obtained from HQ USAF/LEYSF through the Major Command. Even though top loading capability may be available at a base for inter-service support, no USAF avfuel refueling vehicle will be top loaded. The use of selective couplers for bottom loading of ground fuels from fillstands is encouraged, but is mandatory at those installations that have ground fuels trucks equipped with bottom loading fittings and high level cut-off. Bases with these refuelers will submit projects to provide bottom loader capability at the corresponding fillstands.