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FIRE DEPARTMENT
INFORMATION BULLETIN

SUBJECT: ABOVEGROUND FLAMMABLE AND COMBUSTIBLE LIQUIDS STORAGE TANKS

Bulletin Number: 036
Date of Issue: December 30, 1996

Code Reference:
1994 Uniform Fire Code (UFC) Articles 79 & 80
Santa Rosa City Code (SRCC), Chapters 18-16 & 18-44
California Code of Regulations, Title 23
Code of Federal Regulations (CFR), Section 40, Chapter 280

NOTE: This bulletin is intended to serve as a guideline to insure plan submittals address the relevant code sections and to present the Fire Department's interpretation of City, State and Federal Codes and standard industrial practices. To facilitate plan review for new installation's each requirement identified below should be clearly identified on the plans.

DEFINITIONS

Aboveground Storage Tank (AGST) is a vessel exceeding 60 U.S. gallons which is above, at or below grade without backfill whose entire surface is able to be visually inspected. Aboveground storage tanks may include tanks at grade or within below-grade vaults provided all surfaces are able to be visually inspected.

Below-grade Vaulted Tank is an aboveground tank within a vault located below the adjacent ground level. The vault must be accessible to personnel and the tank surfaces must be available for visual inspection. (Note: facilities with vaults requiring confined space entries shall be required to submit a copy of their confined space training plan with the aboveground tank installation permit application.)

Portable tank is a tank designed primarily to be loaded into or on, or temporarily attached to, a transport vehicle or ship. It does not include skid-mounted tanks used for dispensing or collection purposes.

PERMIT REQUIREMENTS

Tank Installation Permits must be obtained from the Fire Department for the installation of any aboveground storage tank. A separate permit shall also be required by the Building Division for the site modifications, structural pad and electrical service, as required to facilitate the installation. Contact Community Development to determine which, if any, use permit requirements apply.

Temporary Closure Permits shall be obtained from the Fire Department for tanks out of service for more than 90 days. Temporarily closed tanks must be safeguarded in accordance with UFC Article 7902.1.7.2.2.

Tank Closure Permits shall be obtained from the Fire Department for tanks out of service for more than one year or tanks which are to be removed. Tanks shall be closed in accordance with UFC Article 7902.1.7.4, properly cleaned or treated as hazardous waste. Refer to the UST removal standard for cleaning procedures.

GENERAL REQUIREMENTS

The storage and use of aboveground flammable and combustible liquid storage tanks is prohibited within the limits established by law, but may be permitted on a case-by-case basis when the installation of an underground tank is impractical due to process or equipment requirements, or due to specific site constraints. The tank(s) may be used for fueling private, fleet or governmental vehicles, construction equipment, waste oil storage, emergency generator fuel supply, or any other situation the Fire Chief deems acceptable. They shall generally not be approved for service stations or other commercial retail applications.

A. FIRE PROTECTION

A fire extinguisher with a minimum rating of 10A:80BC shall be provided and located between 15 and 75 feet from the tank.

B. ELECTRICAL

Electrical wiring and equipment shall be of the type approved for use in hazardous locations, and shall be installed in accordance with the Electrical Code. Refer to UFC Table 7901.4-A for general requirements for Class I electrical equipment locations. Obtain an electrical permit from the Building Department.

C. LABELING

Tanks shall be labeled with the specific name of the material contained and placarded with hazard identification signs (i.e. diamond placard) as specified in UFC Standard No.

79-3. Placards shall be no smaller than fifteen inches by fifteen inches (15"x15"). Letters for the material name shall not be less than 3 inches in height and ½ inch in stroke. Signs prohibiting smoking shall also be posted at tank locations.

D. LISTING (UL OR OTHER NATIONALLY RECOGNIZED STANDARD)

1. Tanks shall be "double-walled".
2. Primary tanks shall be listed in accordance with UL-142.
3. Fire protected tanks shall be listed in accordance with UFC Standard A-II-F-1 and shall have a minimum fire protection rating of 2-hours.

E. LOCATION

1. Each tank shall be installed on a foundation properly engineered to support the tank weight and conditions of use. Tank(s) shall be appropriately seismically secured and braced with the surface sloped away from the tank to prevent pooling under the vessel.
2. Interior tanks for flammable and Class II and III-A combustible liquids, including tanks located under a canopy, shall be installed in accordance with UFC Articles 79 & 80, and UBC Chapter 9.
3. The area surrounding a tank shall be kept clear of combustible materials and vegetation for a minimum distance of 30 feet.
4. Exterior tanks for flammable and Class I, II and III-A combustible liquids shall be located in accordance with UFC Table 7902.2-F as follows:

Tank Capacity	Minimum distance to property lines, or opposite side of public ways.	Minimum distance to buildings or nearest side of public ways.
60 to 275	5	5
276 to 750	10	5
751 to 6,000	15	5

F. VEHICLE PROTECTION

Tanks subject to potential vehicular damage shall be protected by guard posts or other approved means. Guard post shall be designed in accordance with UFC Section 8001.9.3, as follows:

1. Constructed of steel not less than 4 inches in diameter and concrete filled,
2. Spaced not more than 4 feet between posts on center.
3. Set not less than 3 feet deep in a concrete footing not less than 15-inches in diameter.
4. Set with the top of the posts not less than 3 feet above ground.
5. Located not less than 5 feet (4 feet on dispensing side) from the tank.

G. MAXIMUM PERMITTED VOLUMES

Tanks shall not exceed a 500-gallon individual or 1,000-gallon aggregate capacity per site. Installations having the maximum allowable aggregate capacity shall be separated from other such installations by not less than 100 feet.

H. MONITORING

A method of monitoring the secondary containment for above ground tanks must be provided. An electronic monitoring system is preferred over visual/manual methods where the secondary containment is closed, and shall be mandatory for fire-protected tanks where the secondary containment is filled with insulating material. Where electronic vapor monitoring is provided, the system shall have a maximum sensitivity of 1,000 ppm TPH. Where visual monitoring is acceptable, a daily inspection record must be maintained. Failure to maintain inspection records will require that an electronic system be installed.

I. OVERFILL PROTECTION

1. Each tank shall be provided with **overfill protection** that meets the following requirements:
   a. Tanks shall be continuously attended during filling operations. An alarm shall be provided to alert the attendant when the tank reaches 90% capacity; or
   c. A system shall be provided to positively shut-off flow to the tank when the tank is filled to no more than 95% capacity.
2. Each tank shall be provided with **overfill containment** of at least five (5) gallons capacity and a containment curb of appropriate height around the tank. Within the dyked area, the tank bottom shall be sealed to prevent pooling under the tank and sealed with an approved chemically resistant coating.

J. SECONDARY CONTAINMENT

Tank and piping systems must be secondarily contained. The tank's secondary containment must be constructed so as to provide an interstitial space that can be monitored and tested. Secondary containment shall be large enough to contain 110% of the volume of the primary container, and shall be constructed of materials of sufficient thickness, density, and composition so as not to be structurally weakened as a result of contact with the discharged fuel and so as to be capable of containing the fuel for a period of time equal to or longer than the maximum anticipated time sufficient to allow recovery of the fuel. If the secondary containment is open to rainfall or fire sprinklers, it shall be capable of containing the volume of a 24-hour rainfall as determined by a 100-year storm history, or the volume of 20-minutes of sprinkler flow.

K. VENTING

1. **Normal vents** shall not be less than 1 1/4-inch nominal inside diameter. Where tanks are used for storage of Class I and II liquids, vent pipes shall terminate outside buildings at a point not less than 8 feet above the fill pipe opening and not less than 12 feet above the adjacent ground level. Vent lines shall terminate outside of buildings, a minimum of 5 feet from openings in a building or property line that can be built upon, and located so that flammable vapors will not be trapped by eaves, equipment enclosures or other obstructions.

2. **Emergency pressure relief vents** shall be provided for both primary and secondary containment tanks to relieve excessive internal pressure caused by exposure to fire in accordance with UFC 7902.2.6. Devices such as engineered vent caps with weighted closures, manholes using long bolts that enable the cover to lift under internal pressures, or approved pressure/vacuum venting devices or flame arrestors shall be acceptable.
3. **Ball/Float Valves*** shall be provided for the fill, vent, and withdrawal connections (exception: suction systems) to prevent fuel from entering these lines.

L. MATERIALS OF CONSTRUCTION

Tanks, piping, valves, fittings and related components appurtenant to, or intended for, the storage of hazardous materials shall be designed and fabricated from materials compatible with the materials to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress, and exposure to which they could be subjected; and shall be listed and approved per UFC Article 79, 80 and 90.

Exterior above ground tanks containing Flammable-I or Combustible-II liquids shall have a fire protection rating of not less than 2-hours in accordance with UFC Standard A-II-F-1*.

Low melt point materials such as copper, aluminum or brass which soften under exposure to heat shall not be used for piping, valves or fittings used for the transmission of Flammable-I or Combustible-II liquids. (UL330 for gas hose, UL 482 for valves)

DISPENSING OPERATIONS

A. BAAQMD NOTIFICATION

All tank installations for fuel dispensing must also comply with Bay Area Air Quality Management District requirements (Contact BAAQMD at 415-770-6000).

B. DISPENSING PIPING

1. Motor fuels shall be transferred from tanks by means of fixed pumps which are designed and equipped to allow control of the flow and to prevent leakage or accidental discharge.
2. Tank and tank enclosure openings shall be through the top only. Approved antisiphon and backflow prevention devices shall be installed at each connection of piping to a tank when such piping extends below the level of the top of such tank, and
3. Dispensing devices are allowed to be installed on top of special enclosures.

C. DISPENSING LOCATION

1. Dispensing activities shall not be conducted within 15 feet of buildings or combustible materials.
2. Dispensing activities shall not be conducted within 25 feet of building openings, property lines, streets or public ways.
3. Motor vehicle fuel dispensing shall be conducted on a reinforced concrete pad having a minimum area of 10' x 10'.

D. SIGNAGE

Warning and identification signs shall be installed as specified in UFC Standard 79-3. Conspicuous signs prohibiting smoking and dispensing into unapproved containers, and requiring vehicle motors to be stopped during fueling operations shall be posted as applicable.

PLANS AND INSPECTIONS

Plans addressing the aforementioned requirements must be submitted with each permit application to Fire Department for complete review. The minimum information on plans must include the method of storage and dispensing; quantities and types of liquids to be stored; distances from tanks and dispensers to property lines, public ways and buildings; vehicle access; collision barriers; design and construction of tanks and tank supports; seismic design and supporting calculations of tank supports; secondary containment; tank venting and vapor recovery provisions; emergency controls and any additional information required by the chief. Include manufacturer specification sheets where applicable.

Each tank, piping and secondary containment system shall be subject to field hydrostatic or pneumatic integrity testing at the installation site before being placed in use. Testing by the tank manufacturer prior to shipment shall not be accepted. All monitoring systems and controls, including secondary containment monitoring, overfill protection devices, automatic shut-off controls, etc., shall also pass a functional test. All tests shall be witnessed by the Fire Inspector.

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* Waste oil tanks that are dispensed directly into by gravity, i.e. no remote fill or pumping, and diesel fuel emergency generator "day" tanks not exceeding 60 gallons shall be exempt.