Underground Flammable Liquid Tank Installation

LOCATION: A flammable or combustible liquid storage tank may be located underground, outside or under a building if such installation meets the requirements of this bulletin. The tank shall be so located with respect to existing foundations and supports that the loads carried by the latter cannot be transmitted to the tank. The distance from any part of a tank storing flammable liquids to the nearest wall of any property line that may be built upon, not less than 3 feet. A minimum distance of 1 foot, shell to shell, shall be maintained between underground tanks. (Ref: Section 7902.6.3, U.F.C., 1994 Edition)

DEPTH AND COVER: Excavation for underground storage tanks shall be made with due care to avoid undermining of foundations or existing structures. Underground tanks shall be set on firm foundation land surrounded with soft earth or sand tamped in place. Tanks shall be covered with a minimum of 2 feet or earth or a slab of reinforced concrete not less than 4 inches thick. When underground tanks are or are likely to be subjected to traffic, they shall be protected against damage from vehicles passing over them by at least 3 feet of earth cover, or 8 inches of asphaltic concrete. When asphaltic or reinforced concrete paving is used as part of the protection, it shall extend at least 1 foot horizontally beyond the outline of the tank in all directions. (Ref. Section 7902.6.4, U.F.C., 1994 Edition).

ANCHORAGE: Where a tank may be buoyant due to a rise in the level of the water table or due to location in an area that may be subjected to flooding, suitable precautions shall be observed to anchor the tank in place. (Ref: Section 7902.6.7, U.F.C., 1994 Edition).

LOCATION AND ARRANGEMENT OF VENT: Vent pipes from tanks storing flammable or combustible liquids shall be so located that the discharge point is outside the buildings, shall terminate not less than 8 feet above the fill pipe opening and not less than 12 feet above the adjacent ground level. Vent pipes shall discharge only upward or horizontally (not downward) in order to disperse vapors. Vent pipe outlets shall be so located that flammable vapors will not enter building openings or be trapped under eaves or other obstructions, nor discharge to hazardous locations. Vent lines shall not terminate within 5 feet of openings into a building or within 5 feet of a property line that may be built upon. Tanks containing Class 1-A liquids shall be equipped with pressure and vacuum venting devices with integral flame arresters, which shall be normally closed except when venting under pressure or vacuum conditions. Tanks storing Class 1-B or Class 1-C liquids shall be equipped with pressure/vacuum venting devices or with liquid flame arrester. (Ref: Section 7902.1.10.9 general & 7902.1.10.4, U.F.C., 1994 Edition)

VENT LINES: Vent lines from tanks underground or in buildings shall be used for no other purposes. (Ref: Section 7902.1.10.2, U.F.C., 1994 Edition).

SIZE OF VENTS: Each tank shall be vented through piping adequate in size to prevent blow back of vapor or liquid at the fill opening while tank is being filled. Vent pipes shall be not less than 1 1/4 inches nominal inside diameter. (Ref: Section 7902.1.10.7, U.F.C., 1994 Edition).

VENT PIPING: Vent pipes shall be so laid as to drain toward the tank without sags or traps in which liquid can collect. They shall be located so that they will not be subjected to physical damage. Vent pipes from tanks storing the same class of liquids may be connected into one outlet pipe. The outlet pipe shall be at least one pipe size larger than the largest individual vent pipe connected thereto. In no case shall the point to connection between vent lines be lower than the top of any fill-pipe opening. The lower end of a vent pipe shall enter the tank through the top of any fill-pipe opening. The lower end of a vent pipe shall enter the tank through the top and shall not extend into the tank more than 1 inch. (Ref: Section 7902.1.10.5, U.F.C., 1994 Edition).
FILL AND DISCHARGE PIPING FOR UNDERGROUND TANKS: Fill and discharge lines for Class I, II, and III liquids shall enter tanks only through the top and shall be graded toward the tank. (Ref: Section 7902.1.12.2.3, U.F.C., 1994 Edition).

SCHEDULE OF INSPECTIONS: *

1. **Underground Plumbing Inspection**: To be made after the tank is in place on the substrate. Inspector will look at water conditions (if any) and see if any anchoring from structural drawings is in place. Back fill material should be on site for the inspector to see.

2. **Rough Plumbing/Mechanical Inspection, Primary Piping**: To be done after the tank is installed, backfilled and the top is exposed. A 50-lb. test is performed at this stage.

3. **Rough Plumbing/Mechanical Inspection, Secondary (Containment) Piping**: To be done after the containment piping is in place. A 5 pound test is performed on this part of the system. Usually this inspection is called for after the primary piping inspection is done.

4. **Final Plumbing/Mechanical**: To be done after all of the piping is connected and tested and the pumps are installed. Inspector will check the final tie in to the break-aways.

5. **Fire Final**

*Tanks and piping connected to underground tanks shall not be covered until it has been approved (Reference 1994 Uniform Fire Code, section 7902.6.16.1)

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Ron Thompson, Building Official
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