

Huntington Beach Fire Department

Installation of Underground Storage Tanks (USTs)

This City Specification provides guidance on the installation of underground storage tanks (USTs) containing flammable or combustible liquids. While the primary use of USTs is the storage of motor vehicle fuels, this City Specification can also be applied to the installation of USTs that will contain other types of hazardous materials.

In addition to the Huntington Beach Fire Department (HBFD), other regulatory agencies are involved in UST installation including the Orange County Health Care Agency/Environmental Health Division (OCHCA) and the South Coast Air Quality Management District (AQMD). These agencies must be contacted separately for their specific regulations.

- Installation of aboveground storage tanks (ASTs) are covered under HBFD *City Specification #425, Installation and Maintenance of Aboveground Storage Tanks for Fuel Dispensing Stations, Lubricating Oils and Waste Oils.*
- Installation of motor vehicle fuel dispensing devices is covered under Huntington Beach Fire Code (*HBFC*) Chapter 22.
- Installation of a tank in a vault is covered by *HBFC Section 3404.2.8 Vaults.*

After installation is completed, submit copies of installation records, tank specifications, testing records, and “as-built” plans to:

Fire Department Administrative Offices
2000 Main Street
Huntington Beach, CA 92648
(714) 536-5411

REQUIREMENTS

1. PLANS

- 1.1 Submit plans to the City of Huntington Beach Department of Planning and Building, which serves as the lead department for new construction projects. The Department of Planning and Building will then distribute plans to other City departments. Plans should include the following:

- Plot plan showing the location of the tank and piping on property, including orientation;

Installation of Underground Storage Tanks (USTs)

- Tank specifications including size, materials used in construction, appurtenances, openings, etc.;
 - Piping specifications;
 - Specifications on appurtenances (pumps, valves, piping, spill sumps, etc.);
 - Site safety plan;
 - Project timeline.
- 1.2 Catalog cuts are appropriate for standard materials, devices, and appurtenances used as part of the installation.

2. PERMITS

- 2.1 In addition to building permits for initial construction and installation, HBFD requires a Fire Department operational permit for ongoing operation of a UST.
- 2.2 Completion of a Hazardous Materials Disclosure packet will be required for use and storage of hazardous materials if the quantities exceed 55 gallons of a liquid, 500 lbs. of a solid or 200 ft³ of a gas.
- 2.3 Other agencies may require that operational permits be obtained including:
- OCHCA – Underground storage tank management and hazardous waste management.
 - AQMD – Air pollution control systems.

3. INSPECTIONS

- 3.1 Required inspections will be indicated on the Building Permit issued for the UST installation. The HBFD requires the following inspections:
- Bottom of hole prior to tank installation;
 - Tank data verification (materials, fabrication, serial numbers, etc.);
 - Tank installation and pressure test;
 - Piping pressure test;
 - Final inspection of the complete installation.

4. LOCATIONS WHERE TANKS ARE ALLOWED

- 4.1 USTs shall be located where they will not be subjected to the loads of surrounding buildings, foundations or supports (*HBFC Section 3404.2.11.2 Location*).
- 4.2 USTs shall be located at least 3 feet from the nearest wall, basement or pit, and at least 1 foot from neighboring USTs (*HBFC Section 3404.2.11.2 Location*).

Installation of Underground Storage Tanks (USTs)

- 4.3 In areas subject to flooding, USTs shall be provided with uplift protection [*NFPA 30, HBFC Section 3404.2.7.8, California Code of Regulations (CCR) 23CCR2635(a)(7)*].

5. TANKS REQUIREMENTS

- 5.1 Materials used in tank construction must be compatible with the intended hazardous contents of the tank, and fabricated per NFPA 30 (*HBFC Section 3404.2.7.1 Materials Used in Tank Construction*).
- 5.2 Steel tanks are allowed as long as they are compatible with the material that will be stored in it. Corrosion and/or galvanic protection is required for steel tanks, except in cases where the steel tank is surrounded by a secondary containment tank that prevents the steel from contact with the soil or other materials that could cause tank corrosion.
- 5.3 Corrosion and galvanic protection will also be required if any components used on the tank are fabricated from materials that could be subject to corrosive action. Tanks and their components can be protected by fabrication with corrosion resistant materials, by applying a corrosion resistant coating, or by other approved corrosion inhibiting methods (*HBFC Section 3403.6.5 Protection from Corrosion & Galvanic Action, HBFC Section 3404.2.7.9 Corrosion Protection*).
- 5.4 The exterior surface of the tank shall have some type of permanent marking designating the following:
- Engineering standards used for the tank's design
 - Manufacturer's name
 - Year of manufacture
 - Construction materials used in tank fabrication
 - The nominal dimensions of the tank (length, width, diameter)
 - Capacity and useable capacity of the tank
 - Degree of secondary containment
 - Design pressure (in psig)
 - Operating temperature (*23CCR2631*)
- 5.6 Tanks shall be designed for the expected pressures they will be subjected to, and to meet the testing requirements found in section 10 of this City Specification (*HBFC 3404.2.7.2 Pressure Limitations for Tanks*).
- 5.7 Tanks shall be compatible with the material to be stored within.
- 5.8 All connection points to the UST shall be on the top portion of the tank (*HBFC 3404.2.7.5.5.2 Underground Tanks*).

Installation of Underground Storage Tanks (USTs)

- 5.9 Striker plates shall be installed at the bottom of the primary tank below each tank opening. The plates shall be sufficient to prevent damage to the primary tank's surface [23CCR2631(c)].
- 5.10 Secondary containment systems shall be capable of containing 100% of the capacity of the primary tank. They shall be equipped with a sump and system to allow for visual or mechanical/electronic inspection, and removal of any material accumulating in the interstitial space between the primary and secondary tank (23CCR2631).
- 5.11 Tanks shall be equipped with some type of overflow containment system that will prevent material spilled during delivery from entering the environment. It shall be at least 5 gallons capacity, and have a drain device that allows captured material to be drained into the UST (23CCR2635).
- 5.12 Tanks shall be equipped with overfill protection system that notifies the operator when the tank is 90% full, and shuts down filling operations when the tank is 95% full [23CCR2635(b)(2)].
- 5.13 Older tanks may be reused as long as they meet all performance requirements for new USTs and piping systems, including all testing, monitoring, corrosion and compatibility requirements (*HBFC Section 3404.2.13.1.5 Reinstallation of Underground Tanks*).

6. PIPING, VALVES AND OTHER APPURTENANCES

- 6.1 Piping, valves and vent systems shall be designed to the standards listed in NFPA 30 (*HBFC Section 3403.6.2 Design of Fabrication of System Components*).
- 6.2 Low melting point materials are allowed to be installed in underground portions of the UST system. When used in aboveground portions of a UST system, the low melting point materials must be protected to prevent damage during exposure to excessive heat (*HBFC Section 3403.6.3 Testing*).
- 6.3 If recycled components are used as any part of the piping system, including valves and other appurtenances, the Fire Code Official can require testing of the recycled (*HBFC Section 3403.6.1 Non-applicability*).
- 6.4 Any above ground piping shall be protected by guard posts or other approved methods (*HBFC Section 3403.6.4 Protection from Vehicles*).
- 6.5 The piping system shall incorporate a sufficient number of valves to control liquid flow during normal operation, and in the event of physical damage or fire to aboveground portions of the system (*HBFC Section 3403.6.6 Valves*).
- 6.6 Backflow protection shall be installed where there is a possibility of backflow from a connection to a tank vehicle, another tank, or another piping system (*HBFC Section 3403.6.6.1 Backflow Protections*).

Installation of Underground Storage Tanks (USTs)

- 6.7 Underground piping systems and vent systems shall be provided with flexible joints in areas where pipe movement can occur, where the piping system connects to the UST, or where piping connects to a pump island, dispensing device or fill pipe.
- 6.8 Vent piping shall be appropriate for the type of material to be stored in the tank.
- 6.9 Vent pipe outlets shall terminate at least 12 feet above ground level at points where vapors will not be trapped by surrounding structures, and shall be at least 5 feet from surrounding lot lines and buildable property (*HBFC Section 3404.2.7.3.3 Vent Pipe Outlets*).
- 6.10 Vent piping shall be installed so that condensing vapors will drain back towards the tank, with no traps or sag areas where condensed material could accumulate (*HBFC Section 3404.2.7.3.4 Installation of Vent Piping*).
- 6.11 Manifolding is allowed for vapor recovery, air pollution control and vapor conservation purposes as long as:
- The manifolded system is designed so that no individual tank's pressure requirements are exceeded.
 - To prevent contamination of any single tank's contents with that of the other tank.
 - Designed to prevent pressure/vacuum limits of any tank and its associated piping system from being exceeded.
 - The materials in each tank are compatible and their comingling will not cause an adverse chemical/physical reaction (*HBFC Section 3404.2.7.3.5 Manifolding, HBFC Section 3404.2.7.3.5.2 Underground Tanks*).
- 6.12 Vent piping is not allowed to be consolidated unless the vapors of the materials in the comingled vent systems are compatible, the comingling of materials will not adversely affect one of the materials, and the comingling will not change the classification of either material (*HBFC Section 3404.2.7.3.5.3 Tanks Storing Class I Liquids*).
- 6.13 Fill pipes and discharge pipe openings shall be located at least 5 feet from buildings and property lines (*HBFC Section 3404.2.7.5.2 Filling, Emptying and Vapor Recovery Connections*).

7. MONITORING SYSTEMS

- 7.1 A UST and its associated components shall be provided with an approved method of leak detection capable of detecting a release from either the primary tank into the secondary containment vessel, or from the piping system associated with the tank and its dispensing mechanism (*23CCR2631*).

Installation of Underground Storage Tanks (USTs)

7.2 Daily inventory records of a UST's contents shall be maintained (*HBFC Section 3404.2.11.5 Leak Prevention*).

8. EMERGENCY SHUT OFF REQUIREMENTS

Underground tank installations shall be equipped with emergency shut off devices that will allow the dispensing and fill system to be shut down in emergency situations. The emergency shut off devices shall be located between 20 feet and 100 feet of the tank and/or dispensing device, and shall be clearly marked with a sign/label designating its location (*HBFC Section 2203.2 Emergency Disconnect Switches*).

9. DISPENSING DEVICES

9.1 Dispensing devices for **non-motor vehicle fueling** operations shall include:

- Static grounding between the UST, piping system, the dispensing device, and the container or container filling system;
- Pressure relief devices when dispensing involves the use of positive displacement pump systems. Relief valves shall be used for both the piping system and for the tank system;
- Closed systems when the hazardous material's flash point or lower explosive limit could be exceeded during normal use. Closure can include covers for containers or vessels containing the materials of concern (*HBFC Section 3405 Dispensing, Use, Mixing and Handling*).

9.2 Dispensing devices for **motor vehicle fueling** operations shall include:

- Emergency shut off valves that close in the event of a fire or impact shall be installed at the base of each dispenser. Dispensers containing vapor recovery return lines shall also be equipped with emergency disconnect valves or shear sections (*HBFC Section 2206.7.4 Dispenser Emergency Valve*).
- Dispensing systems that contain vapor recovery systems shall be equipped with an acceptable method to close off either the fuel dispensing line, or the vapor recovery line, if either system is not functioning (*HBFC Section 2206.7.9.1 Vapor Balance Systems*).
- Dispenser hoses shall be equipped with breakaway devices designed to contain liquids on both sides of the break point. Hoses shall be a maximum 18 feet in length, and must be protected from damage when not in use (reeled, racked, etc.) (*HBFC Section 2206.7.5 Dispenser Hose*).

Installation of Underground Storage Tanks (USTs)

- Dispenser hose fill nozzles must be equipped with an automatic shut off devices that operates when a latch is released, when hose pressure drops, when the nozzle is removed from a fill pipe (interlock device), when a fill valve is released, or upon impact of the nozzle with the surface of the filling area (*HBFC Section 2206.7.5 Dispenser Hose*).
- An emergency shut off switch shall be provided to stop the flow of fuel in the event of a hazardous material spill or other emergency. The switch shall be located between 20 feet and 100 feet of the fuel dispensing devices, and must be conspicuously marked "EMERGENCY FUEL SHUT OFF" (*HBFC Section 2203.2 Emergency Disconnect Switches*).
- Guard posts, bollards, or other approved barrier devices shall be provided for each dispensing device or group of devices, and for all associated piping and appurtenances subject to vehicle impact.
- Dispensing devices shall be equipped with some type of containment system. This can be secondary containment berms for simple dispensing from piping systems, or under dispenser containment devices for motor vehicle fuel dispensing devices (*23CCR2636*).
- Dispensing devices shall be protected by either of two methods or both methods may be used together:
 - Securely mounting the dispensing device on a concrete island at least 6 inches above the surrounding surface, **AND/OR**
 - Protected by installing guard posts/bollards that are constructed of concrete-filled steel tubing at least 4 inches in diameter, 7 feet in length, minimum 3 feet above ground, and spaced a maximum 4 feet apart (*HBFC Section 2206.7.3 Mounting of Dispensers*).

10. TESTING

- 10.1 The UST and its associated piping systems shall be tested after installation, but before being covered. Testing shall be in accordance with the manufacturer's standards or *NFPA 30, Section 4.4*.
- 10.2 Testing pressures shall be at least 150% of anticipated pressure for hydraulic testing, or at least 110% for pneumatic testing. Pressures shall be maintained for at least 30 minutes and shall be maintained long enough to allow visual inspection and/or soap testing of all joints and connections. Where appropriate, vacuum testing is allowed for suction lines or where it is more appropriate for tank and/or piping systems (*23CCR2635*).

Installation of Underground Storage Tanks (USTs)

- 10.3 Vent piping systems are allowed to be segregated from testing, and tested separately from the tank and other piping systems [HBFC Section 3403.6.3, Testing, 23CCR2635(a)(3)].
- 10.4 Prior to placing an installed tank into service, the Fire Code Official may require a post installation test be performed to verify no damage occurred during the installation process (23CCR2635(a)(5)).

11. CHANGE OF CONTENTS

- 11.1 The contents of a UST may be changed provided the following conditions are met:
- The previous contents are completely removed from the tank, piping systems, metering and dispensing devices;
 - The new contents are compatible with the tank, piping, appurtenances and dispensing devices;
 - All pressure systems and vent systems are compatible with the new material and meet operational requirements for the new material.

12. SAFETY AND SECURITY

- 12.1 Grass weeds and other combustible materials shall be kept away from the installation site.
- 12.2 The installation site shall be provided with adequate security. At a minimum, the site must be surrounded by fencing to prevent intrusion. In addition, 24 hour security personnel may be required if, in the judgment of the Fire Code Official, the nature of the installation site justifies enhanced security methods.
- 12.3 The installation site shall be equipped with signs warning of the site's hazardous nature, and with emergency contact information of the UST installation contractor or site owner.
- 12.4 The installation site shall be equipped with fire extinguishers rated at least 3-A :40-B :C. The extinguishers shall be located so that no point within the construction area is no more than 30 feet of travel distance from an extinguisher. Distances of travel shall not include the direct distance over the tank installation hole, but must use the distance around the hole.

APPROVED: _____
Patrick McIntosh, Fire Chief

DATE: _____