

SUFFOLK COUNTY
DEPARTMENT OF HEALTH SERVICES
DIVISION OF ENVIRONMENTAL QUALITY

**ABOVEGROUND OUTDOOR TANK AND ASSOCIATED
PIPING DESIGN STANDARDS**

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SUFFOLK COUNTY DEPARTMENT  
OF HEALTH SERVICES

Suffolk County Department of Health Services'  
Aboveground Outdoor Tank and Associated Piping Design Standards

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1.0 GENERAL

- 1.1 The purpose of this standard is to define the requirements for aboveground outdoor tank construction under Article 12 of the Suffolk County Sanitary Code. This standard applies to outdoor aboveground tanks intended for the storage of toxic or hazardous materials, as defined in §760-1203 ("Definitions") of Article 12 of the Suffolk County Sanitary Code. Containers designed to be movable, but with a volume exceeding 80 gallons in capacity, are considered tanks and are therefore regulated by this standard. Containers such as drums, with a capacity not exceeding 80 gallons and designed to be transported or shipped, are considered portable containers and are not regulated by this standard.
- 1.2 The New York State Department of Environmental Conservation has recognized conformance with Article 12 of the Suffolk County Sanitary Code as conformance with the New York State Petroleum Bulk Storage Law. Any facility located in Suffolk County which meets the county Article 12 requirements, meets New York State requirements.
- 1.3 Approval of design by Suffolk County Department of Health Services, Environmental Engineering Bureau, is required before any new construction or significant modification to an aboveground outdoor storage facility may proceed.
- 1.4 Referenced Material
- a. "UL 142" means Underwriters' Laboratories, Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids, No. 142, Latest Edition, Underwriters' Laboratories, 333 Pfingston Road, Northbrook, Illinois 60062.
  - b. "API 650" means American Petroleum Institute, Standard 650, Welded Steel Tanks for Oil Storage, Latest Edition, American Petroleum Institute, 1220 L Street NW, Washington, D.C. 20005.
  - c. "API 620" means American Petroleum Institute, Standard 620, Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Latest Edition, American Petroleum Institute, 1220 L Street NW, Washington, D.C. 20005.
  - d. "NFPA 30" means National Fire Protection Association, Flammable and Combustible Liquid Code, No. 30, Latest Edition, NFPA, Batterymarch Park, Quincy, Massachusetts 02269.

2.0 EXEMPTIONS

- 2.1 Tanks located within deep recharge areas or water supply sensitive areas, as defined by Article 7, and which meet all of the criteria set forth below, are exempt from all of the provisions of this standard, except those contained within Section 5.7 ("Overfill Prevention"):
- a. The capacity of the tank is less than 1,100 gallons

- b. The tank is for storage of fuel oil, kerosene, gasoline or diesel fuel used solely for on-site heating, irrigation, or intermittent stationary power production
- c. The tank is located on residential property

2.2 Tanks which **are not** located within deep recharge areas or water supply sensitive areas, as defined by Article 7 and which meet all of the criteria set forth below, are exempt from all of the provisions of this standard, except those contained within Section 5.7 - Overfill Prevention:

- a. The capacity of the tank is less than 1,100 gallons
- b. The tank is for storage of fuel oil, kerosene, gasoline or diesel fuel used solely for on-site heating, irrigation or intermittent stationary power production.

### 3.0 DEFINITIONS

3.1 The definitions of terms used in this standard are those found in Article 7, Section 703 "Definitions" and those found in Article 12, Section 760-1203 "Definitions," with the following additions:

- a. Bureau - the Environmental Engineering Bureau within Suffolk County Department of Health Services, or the succeeding entity responsible for the administration of Article 12 of the Suffolk County Sanitary Code.
- b. Residential - one or two unit dwelling. Multiple dwellings of three or more units are not considered residential for this standard.

### 4.0 SUBMITTALS

4.1 A Permit to Construct, issued by the Environmental Engineering Bureau, is required prior to installation of a new storage facility or substantial modification to an existing facility.

4.2 To obtain a Permit to Construct, the following items must be submitted and approved by the Environmental Engineering Bureau:

- a. A completed Application for a Permit to Construct a Toxic/Hazardous Materials Storage Facility, signed by the owner or owner's representative
- b. A completed Toxic Liquid Storage Registration form (HMM003 Rev.2/88)
- c. A filing fee, as specified in the Fee Schedule for Services Related to Article 12, made payable to Suffolk County Department of Health Services. Federal, state, county, town and village facilities are fee exempt
- d. One set of reproducible plans (sepia, mylar, velum) prepared and signed by a registered professional engineer or architect licenced by the state of New York. The original drawings will be returned to the engineer or architect when the review is complete.

4.3 Each plan submitted for construction approval must include the following:

- a. Key map highlighting the site location
- b. Site plan, of suitable scale, illustrating the following:
  - north arrow
  - existing and proposed buildings
  - property lines
  - all existing and proposed locations for the storage of toxic/hazardous materials
  - all utilities, storm drains, sanitary system, potable water wells, underground and aboveground piping, proposed and existing monitoring wells
  - soil borings
- c. Title block listing the following:
  - facility name and address
  - architect/engineer name, address, phone number, signature, seal
  - Suffolk County Tax Map Number (District/Section/Block/Lot)
  - scale of drawing
  - 4" x 6" empty block for Suffolk County Department of Health Services' approval stamp
- d. Construction details, with appropriate plan and section drawings, including the following:
  - all proposed tankage and piping
  - containment structure, including construction joints
  - roof/rain shields
  - dispensing point
  - coating system, and materials of construction
  - remote fill containment
- e. A partial plan view, including the following:
  - tank containment area with roof/rain shield (including dimensions)
  - piping routes, including location of fill port and dispenser(s)
  - alarm panel location (where required)
- f. A cross-section detail, including the following:
  - tank containment area with roof/rain shield (including dimensions)
  - piping and supports
  - fill port and dispenser
  - soil borings

## 5.0 DESIGN REQUIREMENTS

5.1 All information required by this standard must be illustrated on the design drawing or be included within the design specifications.

5.2 The storage and containment facilities must be impervious to the material which is contained within. Either a signed statement from the tank/container manufacturer, or published compatibility data, is required to certify compatibility with the stored material.

### 5.3 Tank Design

a. All new tanks used for the storage of flammable or combustible materials, must meet, or exceed, the design manufacturing standards of UL #142, API 650, API 620, and carry the appropriate label.

b. Tanks proposed for the storage of materials, other than those specified above, will be considered on an individual basis.

c. All tanks shall be positioned on a suitable support system shaped to fit the contour of the tank. Saddles on tanks containing flammable or combustible materials must have a minimum 2-hour fire resistance rating. All tank saddles must be electrically isolated from tank through the use of dielectric material.

d. Metal tanks and containment structures shall be grounded.

e. All new steel tanks must be externally coated. The coating must, as a minimum, consist of a primer coat, a bond coat, and two or more final coats of paint, or have an equivalent surface coating system designed to prevent corrosion and deterioration. As a minimum, coatings and application methods must meet the requirements of the Steel Structures Painting Council and National Association of Corrosion Engineers.

f. Tank foundations shall be constructed in a manner which allows drainage away from the tank to minimize corrosion.

g. Tanks designed for use underground are generally not suitable for use aboveground. Tank manufacturer must certify that such a tank is suitable for use aboveground.

### 5.4 Containment Structures ~ General

a. An impervious containment structure, i.e., dike or equivalent containment, must be sized to contain 110% of the volume of the largest tank contained within a dike (excluding the volume below the dike level occupied by other tanks), or the secondary tank of a double-walled tank, must be constructed in a manner which will, in the opinion of the commissioner, provide the maximum reasonable protection against discharge to the ground, groundwaters, or surface waters of the county of Suffolk. Additional containment volume, up to 10% of the total volume of all other tanks or vessels contained in a diked area, may be required if the configuration, arrangement or spacing of the existing tanks and dikes does not meet the requirements of NFPA 30.

b. An open containment system must be designed to handle accumulated precipitation. For prefabricated tanks, a roof or rain shield is required. (In these cases, the roof must be designed to prevent the accumulation of wind-driven precipitation, and the containment area must be kept clean

and dry.) Normal minimum roof overhang will be 30 inches. Variations from this requirement will be considered on a case-by-case basis. If roofing is impractical, other proposals for managing accumulated rainwater will be considered on a case-by-case basis.

- c. The containment structure may not have any penetrations below the elevation required for 110% containment volume, unless specifically approved by the Environmental Engineering Bureau.
- d. The containment structure must be designed and constructed in a manner consistent with the requirements of NFPA 30 and the New York State Uniform Fire Prevention and Building Code, where applicable.
- e. The containment structure may be constructed of poured concrete, concrete masonry units, steel or other material suitable to the Environmental Engineering Bureau for creating a permanent, impervious containment structure.
- f. If the interior of the containment structure is not readily visible to the facility operator, a leak detection system meeting Suffolk County Department of Health Services' design standard entitled "Leak Detection Alarm System Requirements for Toxic/Hazardous Materials Storage Facilities" will be required.
- g. Double-wall tanks are acceptable containment structures, providing they meet all other requirements of this standard. Secondary containment tanks must be capable of sustaining a minimum of five (5) pounds per square inch (gauge) pressure for testing the interstitial space for leaks. Double-walled tanks shall be equipped with an adequately sized fill-spill box consistent with the tank filling rate. A method of preventing spillage from the overflow point must be provided. Dispensers shall be equipped with spill containment. To prevent discharge of overfill to the surface of the ground during pumping operations, the primary tank of a double-wall tank must be piped, through an acceptable control, to the secondary containment tank. The secondary tank shall be fitted with a pressure/vacuum vent, and an emergency vent if required by local fire officials having jurisdiction. Secondary containment tanks need not be fitted with a pressure/vacuum vent, emergency vent or overflow piping if filled by hand only.
- h. Materials used in the construction of the containment structure must not degrade when exposed to the product being stored.

#### 5.5 Containment Structures ~ Concrete

- a. All concrete must be designed and installed in a manner which provides an impervious containment structure. The containment structure must be sealed using a coating certified by the manufacturer to be impervious to the materials being stored.
- b. The containment structure should be designed and constructed utilizing a monolithic pour whenever possible, but should be designed with expansion joints as necessary to prevent cracking. These joints shall be designed with a minimal potential for allowing the passage of the product contained.
- c. All construction and expansion joints must incorporate water stops. Water stops must be constructed of a material which is impermeable to, and will not degrade when exposed to, the materials that are, or could be, stored within the containment structure. Joints must be filled with a flexible sealant compatible with the product being stored.

- d. Containment structures utilizing concrete block (cinder block is not acceptable) must be anchored to a concrete slab. The slab thickness shall be a minimum of six inches. The anchoring must, at a minimum, consist of #3 reinforcing bars that have been cast into a new slab, or drilled and grouted into an existing slab, and be installed in alternate blocks, except that corner-forming blocks shall each be anchored. The block cores must be filled solid with concrete or grout. The top of the containment structure shall be finished with solid cap blocks.
- e. All concrete must be a minimum 3000 psi, 28-day strength. The Environmental Engineering Bureau may require that concrete testing be performed. A minimum of one sample of concrete shall be obtained for strength testing for every fifty (50) cubic yards of concrete poured. The sample must be retained for six months. In cases where testing of the sample is required, results must be sent to the Environmental Engineering Bureau before final approval will be granted.
- f. All poured-in-place concrete must be steel reinforced in accordance with the American Concrete Institute "Building Code Requirements for Reinforced Concrete" (latest revision). Concrete block must be reinforced horizontally and vertically in general, but this requirement may be waived if, in the opinion of the reviewing engineer, such reinforcing is not needed.
- g. All concrete must be air entrained.
- h. All concrete must be moist cured for a minimum of seven days before any external loads can be applied.
- i. Tank and containment must be protected from vehicle impact.

#### 5.6 Containment Structures - Metal

- a. Containment structure must utilize continuously welded seams.
- b. The containment structure must be a minimum 14 gauge in thickness and meet all hydraulic and structural requirements.
- c. Stiffeners must be permanently attached to the structure and located as required by good engineering practice.
- d. The interior and exterior of the containment structure must be coated in accordance with the requirements of Section 5.3.e.
- e. The containment structure must be elevated to prevent corrosion associated with ground contact and to permit complete inspection of the structure. In general, CCA lumber is not an acceptable means of supporting the structure, but may be approved on a case-by-case basis if, in the opinion of the reviewing engineering, such support is acceptable.
- f. Containment structure for which ground contact cannot be avoided, must have a cathodic protection system designed in accordance with Section 5.10.
- g. The containment structure must be grounded.

#### 5.7 Overfill Prevention

- a. All storage facilities must have a positive means of preventing overfilling.
- b. Overfill detection is required on all vessels except open top, translucent, or transparent vessels which level is clearly visible to the operator filling the vessel. Overfill alarm systems must comply with Suffolk County Department of Health Services' "Overfill Alarm System Requirements for Toxic/Hazardous Material Storage Facilities." Submittals must include manufacturer, model number and location of probes and alarm panel where applicable. Overfill probes must be rigidly mounted. **Field substitution is prohibited without prior written approval from the Environmental Engineering Bureau.**

## 5.8 Piping and Dispensing

- a. All primary and secondary piping must be corrosion resistant and compatible with the product contained within. Piping located aboveground must be resistant to attack from ultraviolet radiation and ozone attack.
- b. All aboveground piping must be adequately supported using pipe hangers, or other suitable means, properly designed to allow for expansion and contraction. Pipe must be routed to avoid hazards and protected when necessary from mechanical damage.
- c. All aboveground primary piping conveying flammable or combustible materials must be constructed of materials with a high melting point, such as steel, copper, etc. A material which has a low melting point, such as fiberglass, PVC or other plastic material, shall not be used in these applications. Galvanized pipe is not to be used for diesel fuel.
- d. All tank connections through which product can normally flow, must be equipped with a manually operated valve to control the flow. This valve should be located as close to the shell of the tank as possible. This valve is in addition to any automatic valve that may be required.
- e. Pipes for dispensing systems which may experience flow under the effect of gravity, shall be equipped with a normally closed solenoid valve located downstream and adjacent to the operating valve. This valve must be installed and adjusted so that liquid cannot flow by gravity from the tank in case of piping or dispenser hose failure.
- f. All underground piping must be double walled. All metallic piping, in contact with the soil, must be coated with a corrosion protective product and cathodically protected in accordance with the requirements of Section 5.10.
- g. All aboveground piping, which is not located over a containment area, must be of double-walled construction. All aboveground containment piping and components must be manufactured or treated to resist attack from ultraviolet radiation (sunlight) and weathering, and must be labeled as such, or warranted in writing by the manufacturer.
- h. All double-walled piping must be sloped at a minimum of 1/8" per foot to a leak detection area. Containment pipe, which cannot be pitched to drain directly into the tank containment structure, must be sloped to a product-tight, rain-tight sump with a leak detection system. The leak detection system must meet the requirements of the Suffolk County Department of Health Services' design standard

entitled "Leak Detection Alarm System Requirements for Toxic/Hazardous Material Storage Facilities".

- i. Tanks must be fitted with tight-fill connections. Tanks filled by pumping shall be fitted with a check valve and a dry-break fitting wherever backflow is possible through the fill piping.
- j. Interconnections between aboveground and underground tanks are not normally allowed; such connections will be evaluated on a case-by-case basis.
- k. A fire valve, which automatically shuts off flow, is required on piping under which product could flow by gravity.
- l. When making a transition from steel to nonmetallic piping, female steel threads should be joined with male nonmetallic threads.
- m. Gasoline and diesel tanks are not to share the same fill piping.
- n. Wherever over pressurization is possible in piping system, pressure relief valves are required. Such valves must discharge to the tank on which piping is connected. Approval of alternate designs may be approved if acceptable to the reviewing engineer.

#### 5.9 Tanks within Flood Plains

- a. For tanks located within a flood plain - as defined by the Federal Emergency Management Agency - anchoring, or other methods acceptable to the Environmental Engineering Bureau, must be employed to safeguard against tank buoyancy.
- b. Anchoring designs must provide an adequate factor of safety consistent with good engineering practice. Where applicable, anchoring design must be consistent with manufacturers' recommendations. Buoyancy calculations must be submitted with the proposed plans.

#### 5.10 Cathodic Protection Systems

- a. Cathodic protection systems shall be designed for a minimum of twenty years of protection.
- b. Cathodically protected structures must be electrically isolated from all metallic structures which may potentially contact the ground.
- c. The cathodic protection design plan must be submitted to and approved by the Environmental Engineering Bureau.
- d. Systems protected with galvanic anodes must utilize compatible grounding rods.
- e. For systems protected with galvanic anodes, test stations must be located at grade under eight inch (minimum) manhole covers for periodic testing.
- f. For systems protected by impressed current, electrical power should not be controlled by switches under the normal control of the operator.

## 6.0 LABELING

6.1 All tanks must be clearly labeled as to their contents. All fill ports for petroleum products must be permanently color coded in accordance with the codes of the American Petroleum Institute (API) as follows:

|                           |                       |
|---------------------------|-----------------------|
| High gasoline             | Red                   |
| Middle gasoline           | Blue                  |
| Lower gasoline            | White                 |
| High unleaded gasoline    | Red w/white cross     |
| Middle unleaded gasoline  | Blue w/white cross    |
| Lower unleaded gasoline   | White w/black cross   |
| Vapor recovery            | Orange                |
| Diesel                    | Yellow                |
| #1 Fuel oil               | Purple w/yellow bar   |
| #2 Fuel oil               | Green                 |
| Kerosene                  | Brown                 |
| Waste oil                 | Purple                |
| Motor oil                 | Silver                |
| Aviation gas and jet fuel | See API Bulletin 1542 |

6.2 A border must be painted around fuel products containing extenders (such as alcohols). The border must be black around a white symbol and white around all other colors.

6.3 A circle symbol must be used for gasoline products and vapor recovery ports. A hexagon must be used for all other distillates.

6.4 Tanks must be clearly labeled with the product name stenciled on at least four locations, evenly spaced around the perimeter.

6.5 Tanks must be clearly labeled with Environmental Engineering Bureau tank identification number.