

Chapter 9 - Design Guides

9.21 Tank Program Guide

9.21.1 NYS Office of Mental Health Tank System Installation Guide

- A. SITE PLANS:** Provide existing condition, removal plan, and proposed installation site plans for all tanks. Plans must include the following:
1. Dimensions of tank and any structural pads.
 2. Distance of fuel unit from any buildings, property lines, and roads. This varies as per the tank type (Protected – UL 2085) and size and if for heating, dispensing, or compressed natural gas (CNG).
 3. Location of all emergency disconnect equipment (i.e. E-stop button).
 4. Location of all tanks systems, tank monitoring (TM) systems, and any associated lighting.
 - a. Note if TM/ control wire (CAD 6) will need to be greater than 300 feet; if greater than 300 feet then need to use fiber, conduit size 1 ½” dia, to prevent signal loss.
 - b. Consider utilizing a lockable shed to house the electrical sub-panel, disconnects, leak detection panel, etc. to save money on lengthy excavation and conduit runs.
 5. Location of all vents:
 - a. Underground storage tank (UST) vents must be located a minimum of ten (10) feet horizontally from any outdoor air intake openings. Where a vent is located within ten (10) feet horizontally of an intake opening, such opening shall be located a minimum of two (2) feet below the tank vent. [NYSMC 401.4.1]
 6. Location of power panels. Any outdoor panels must be secured in a weatherproof box. Pay close attention to where the disconnect is for the tank heater and if it is “readily accessible”; also check for GFI breaker requirement.
 7. Location of new aboveground (AG) & underground (UG) piping, system alarms and tank location (underground) in relation to other structures and equipment to be installed.
- B. PIPE STANDARDS:** Fuel oil pipe must comply with one of the standards listed in Table 1302.3 of the Mechanical Code of New York State (NYSMC):

TABLE 1302.3 FUEL OIL PIPING

MATERIAL	STANDARD (see Chapter 15)
Brass pipe	ASTM B 43
Brass tubing	ASTM B 135
Copper or copper-alloy pipe	ASTM B 42; ASTM B 302
Copper or copper-alloy tubing (Type K, L or M)	ASTM B 75; ASTM B 88; ASTM B 280
Labeled pipe	(See Section 1302.4)
Nonmetallic pipe	ASTM D 2996
Steel pipe	ASTM A 53; ASTM A 106
Steel tubing	ASTM A 254; ASTM A 539

1. All piping, whether above or below ground, must be of double wall construction. Above ground double wall piping would only apply in special applications and in Suffolk County, otherwise single wall is acceptable.
2. Galvanized piping cannot be used per NYSMC Table 1302.3. Moreover, galvanized piping is more expensive than black piping. However, galvanized piping may be used for above ground vent piping.
3. Underground systems must be made of double wall steel or iron which is cathodically protected or fiberglass reinforced plastic (FRP) or other equivalent non-corrodible material.
 - a. Any alternate (i.e. “other equivalent”) underground piping systems must be submitted to NYSOMH Unit Q and the New York State Department of Environmental Conservation (NYSDEC) for review and approval prior to the completion of the Design Development Phase. Under no circumstances shall the project be permitted to be issued for bid without prior approval by NYSOMH and of both the alternate piping technology and the overall fuel oil system design.
 - 1) New York City (NYC) Facilities only: Any proposed alternate technology underground piping systems that serve emergency generators shall also be submitted to the Fire Department of the City of New York (FDNY) for review and approval prior to the completion of the Design Development phase. In these cases, FDNY approval of the alternate piping technology shall also be required prior to the issuance for bid.
4. All underground piping systems must be equipped with a leak detection system.

C. ABOVEGROUND STORAGE TANK (AST) REQUIREMENTS:

1. A minimum above-grade clearance of six (6) inches is required to facilitate visual inspection of tank bottom surfaces.
2. Integral generator sub-base mounted (“belly”) tanks cannot be used.

- a. Exceptions can be made for use with emergency generators with written approval from NYSOMH Unit Q, but shall be limited to a storage capacity of 500 gallons or less (must be double walled).
 - 1) If installed, all generator belly tank vents must extend through the exterior of the generator enclosure. It cannot terminate within the enclosure (typically 12 feet above finished grade).
3. If tank size is 10,000 gallons or larger then consider using the OP style tank (20% overfill) in lieu of a diked tank. DEC will accept these tanks as an equal to the diked tank.

D. UNDERGROUND STORAGE TANK (UST) REQUIREMENTS: All new underground tanks used in New York State must bear a permanent stencil, label or plate which contains the following information:

1. Manufacturer's statement that, "This tank conforms to 6 NYCRR Part 614".
2. Standard of design by which the tank was manufactured.
3. Petroleum products and percentages of volume of petroleum additives which may be stored permanently and compatibly within the tank or reference to a list available from the manufacturer which identifies products compatible with all tank materials.
4. Year in which the tank was manufactured.
5. Dimensions, design and working capacity and model number of tank.
6. Name of manufacturer.
7. A second label which shows all of the information required above and which also shows the date of installation must be conspicuously displayed and permanently affixed to the fill port. It must be readily visible to the carrier and may be imbedded in concrete, welded to the fill port, or otherwise permanently affixed. Typically this label will either be affixed to the underside of the spill containment bucket lid or fastened to the fill port itself.
8. Note: All new tanks come with a plate that contains the above information. This is consistent with our specification and drawing documents.

E. FILL PORTS: All fill ports must contain a locking mechanism, a spill containment bucket, and be permanently marked with the color and symbol code of the American Petroleum Institute which follows:

(i)	High gasoline	Red
(ii)	Middle gasoline	Blue
(iii)	Lower gasoline	White
(iv)	High unleaded gasoline	Red w/white cross
(v)	Middle unleaded gasoline	Blue w/white cross
(vi)	Lower unleaded gasoline	White w/black cross
(vii)	Vapor recovery	Orange
(viii)	Diesel	Yellow
(ix)	Ultra low sulfur diesel	Yellow with black U
(ix)	#1 fuel oil	Purple w/yellow bar
(x)	Bio diesel	Bronze w/yellow border, black lettering (B##)
(xi)	#2 fuel oil	Green
(xii)	Kerosene	Brown
(xiii)	Waste oil	Purple

The symbols to be used are:

- (i) Circle for gasoline products and vapor recovery lines.
- (ii) Hexagon for other distillate.
- (iii) Border must be painted around fuel products containing extenders such as alcohol. The border will be black around a white symbol and white around all other colors.

F. CATHODIC PROTECTION: Underground steel and iron tanks and/or piping systems must have cathodic protection, regardless of any additional coatings such as high density polyethylene (HDPE). Also, copper piping in direct contact with concrete requires cathodic protection.

1. All cathodic protection systems must be designed to provide a minimum of thirty (30) years of protection.

G. MONITORING SYSTEMS: All tank systems must be equipped with a level monitoring system.

1. Monitoring panels must contain a test/diagnostic button.
2. Outdoor monitoring panels must be located in a secure, weatherproof box.
3. If tank is for consumptive use onsite only, a monitoring system, such as the OMNTEC LU-2, is acceptable. There are applications where mechanical monitoring is acceptable. For example, smaller (275 gal) heating tanks or Lube Cube style tanks often used for smaller electric generators.

H. VALVE REQUIREMENTS:

1. Solenoid or equivalent anti-siphon valves are required for all tank installations. We prefer the solenoid, but it does not fit all applications, so the mechanical anti-siphon valve is acceptable.
2. A manual shutoff valve must be installed in the supply line to isolate tank for maintenance.
3. No valves of any kind should be present in the return line, in order to prevent any over-pressurization that could lead to a spill.

I. TRANSFER PUMPS: Fuel oil transfer pump sets should be mounted horizontally not stacked vertically.

1. They should be easily accessible.
2. Provide check valve(s) in the pump discharge.
3. Provide shutoff valve for maintenance.
4. Provide pressure relief valve/manifold immediately downstream of pump discharge.

J. BOILER OPERATIONS: As a best management practice (BMP) consider installation of oil/water separator (OWS) systems in association with all future boiler systems. However, the following should be considered as part of the decision making with OMH.

1. Boiler oil system loop is closed system and there is no need for oil/water separator; there is no oil discharge into the building drainage system.
2. Oil separators are regulated in the Plumbing Code of New York (PCNYS).
3. PCNYS 1003.4 Oil separators required. At repair garages, car-washing facilities, at factories where oily and flammable liquid wastes are produced and in hydraulic elevator pits, separators shall be installed into which all oil-bearing, grease-bearing or flammable wastes shall be discharged before emptying into the building drainage system or other point of disposal.

- K. PUBLICALLY OWNED TREATMENT WORKS (POTW):** Any system designs that are expected to be connected to the POTW have to be reviewed and approved by the POTW and any other applicable local entities before construction can proceed.
- L. AS-BUILT DRAWINGS:** Upon completion of each project, As-Built site plans must be provided to the owner for their records.
- M.** An affidavit must also be provided to the owner from the manufacturer verifying that the tank and piping installation is approved as installed and that the warranty will be honored.
- N.** Tank manufacturers typically provide two placards with each tank that summarize the tank information (i.e., manufacture date, tank dimensions, etc.). These placards have to be given to NYSOMH prior to the tank installation.

End of NYS Office of Mental Health
Tank System Installation Guide