



FIRE PREVENTION STANDARD

RURAL WATER SUPPLY

SCOPE

This Standard applies to residential and commercial occupancies (Light Hazard and Ordinary Hazard Group 1) in rural and suburban areas where public or private water mains are not available for the provision of required fire flows, or the parcel is not within the service boundaries of a water district, or when approved by the Fire Marshal. The purpose of this standard is to provide the minimum requirements for the design, construction, and installation of private tanks and associated piping that supply water for fire protection in accordance with NFPA 1142, NFPA 22, and the 2022 California Fire Code.

INSTALLATION STANDARDS

Reserve water supply tanks and pumper connections (hydrant) shall be installed, in service, and inspected by the Fire District prior to combustible construction or combustible storage on site.

Tank Requirements

1. Minimum water supply tank capacities are determined by the Fire District in accordance with Chapter 4 of the 2017 Edition of NFPA 1142.
2. For one- and two-family residences, a reserve water supply tank may serve a fire sprinkler system. Where a well, pump, tank, or combination thereof is the source of supply for a fire sprinkler system, the water supply tank shall serve both domestic and fire sprinkler demands. The tank outlet for a domestic and fire sprinkler supply line must be located at a level equal to or greater than 70% of the tank capacity for the purpose of maintaining reserve water for fire suppression operations. A test connection shall be provided downstream of the pump that creates a flow of water equal to the smallest sprinkler on the system and the test connection shall return the water to the tank.
3. An auto-fill system shall be provided to automatically supply water to the tank when the water level falls below 85% of the tank capacity.
4. Water supply tanks shall be equipped with a water level gauge board to provide visual confirmation that water levels are being maintained.
5. Tank foundations or footings shall be adequately designed to support the weight of the operational tank.
6. Water supply tanks shall be provided with a pumper connection outlet for drawing water. See Pumper Connection Requirements for details.
7. Water supply tanks may be remotely located and plumbed to an approved location for the pumper connection, provided that the supply piping to the pumper connections is a minimum of 6 inches. Otherwise, the tank shall be located within 8 feet of an approved fire department access roadway with the pumper connection directly attached and may be supplied by a minimum 4-inch pipe.

8. The tank shall be provided with a vent pipe having a minimum diameter of 5 inches when the pumper connection is directly attached to the tank, and 8 inches when the pumper connection is plumbed to a remote location with a 6-inch pipe. The exterior vent pipe opening shall be provided with a corrosion resistant screen to prevent potential obstructions.
9. Tanks that have the pumper connection directly attached shall be located such that the tank is no further than 250 feet and no closer than 40 feet from the structure to be protected.

Pumper Connection Requirements

1. The pumper connections shall have a 4 ½ inch diameter coupling with national standard male threads and a 4 ½ to 2 ½ removable reducer and provided with a UL/FM listed shut-off valve. The male hose threads of the fire connection shall be protected with a threaded cap.
2. The pumper connection shall be placed within 8 feet of an approved fire department access roadway and located no further than 250 feet and no closer than 40 feet from the structure to be protected.
3. The centerline of the pumper connection shall be between 14 and 36 inches above finished grade of fire apparatus access.
4. A turnout may be required at the pumper connection to maintain a passable roadway when a fire apparatus is connected to the outlet.
5. The pumper connection shall be painted red and shall have a sign posted with the words "DRAFTING HYDRANT ONLY" clearly marked. The sign shall also include the tank capacity in gallons.
6. Posts, fences, vehicles, growth, trash, storage, and other materials or objects shall not be placed in a manner that would physically or visually obstruct the pumper connection.

Piping Requirements

1. Tank plumbing to remote pumper connections shall have a minimum internal diameter of 6 inches, beginning with the discharge outlet pipe reaching to within 6 inches of the bottom of the tank. An anti-vortex plate, with a minimum diameter of 12 inches, shall be provided on the discharge outlet within the tank.
2. Tank plumbing to pumper connections attached directly to the tank shall have a minimum internal diameter of 4 inches, beginning with the discharge outlet pipe reaching to within 4 inches of the bottom of the tank. An anti-vortex plate, with a minimum diameter of 8 inches, shall be provided on the discharge outlet within the tank.
3. Multiple tanks connected in series shall only require an anti-vortex plate within the main discharge tank. Multiple tanks connected by a common manifold shall require an anti-vortex plate in each tank.
4. Multiple tanks connected in series shall be plumbed between tanks with pipe having a minimum internal diameter of 6 inches. Multiple tanks connected by a common manifold shall be plumbed with pipe having a minimum internal diameter of 4 inches to a minimum 6-inch manifold.
5. All exposed pipes and fittings shall be galvanized steel. All piping below grade shall be a minimum of schedule 40 PVC or equivalent. Exposed plastic pipe is not permitted unless UL listed for UV exposure or protected by an approved UV protective coating.
6. Underground piping shall have a minimum depth of bury of 30 inches from top of pipe to finished grade (36 inches below roadways.)
7. On steep grades, underground piping shall be restrained to prevent lateral slipping.
8. Tanks located at an elevation 100 feet or more above the pumper connection outlet will require thrust blocks or an approved joint restraint system to secure piping. All metallic parts below grade, such as rods, nuts, bolts, washers, clamps, and other mechanical restraining devices, shall be cleaned and coated with an acceptable corrosion resistant material.

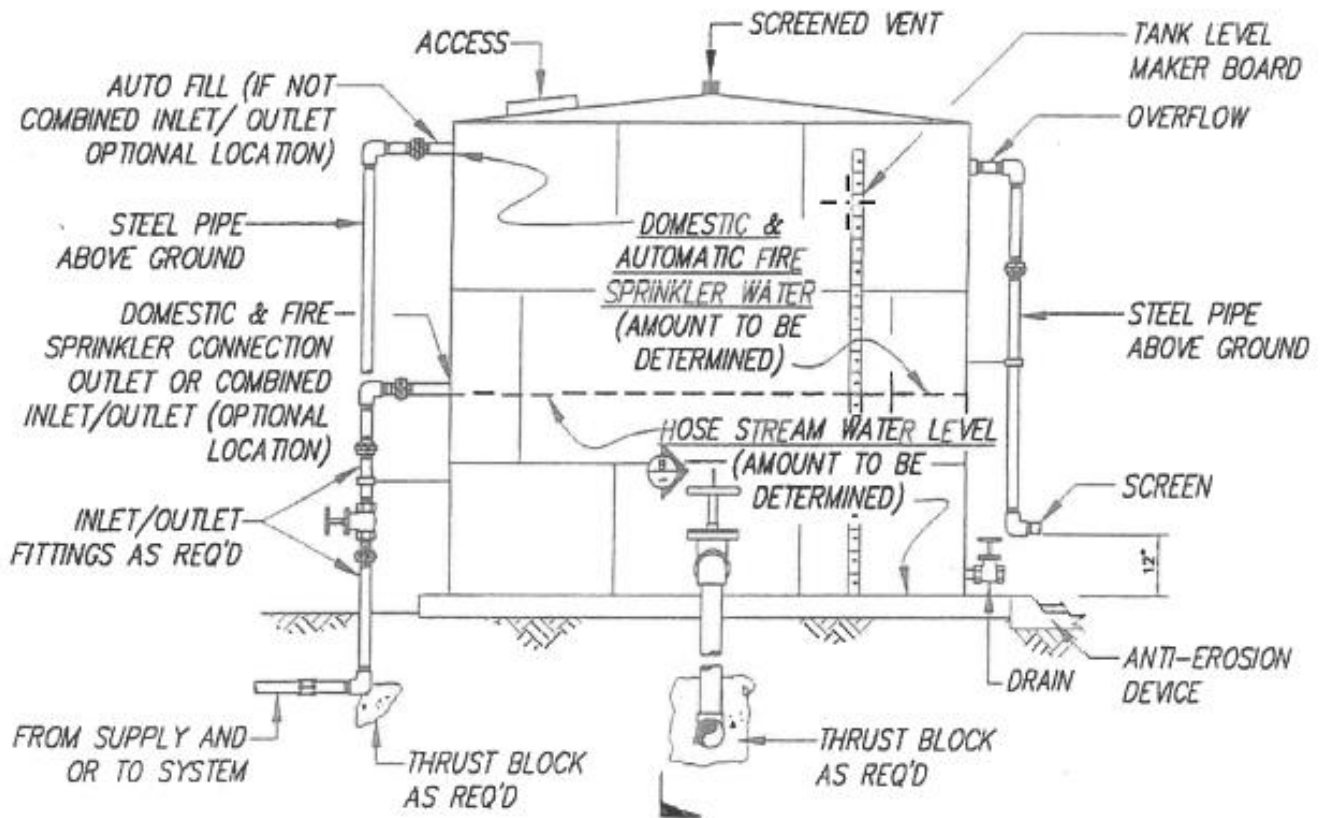
Plan Submittal Requirements

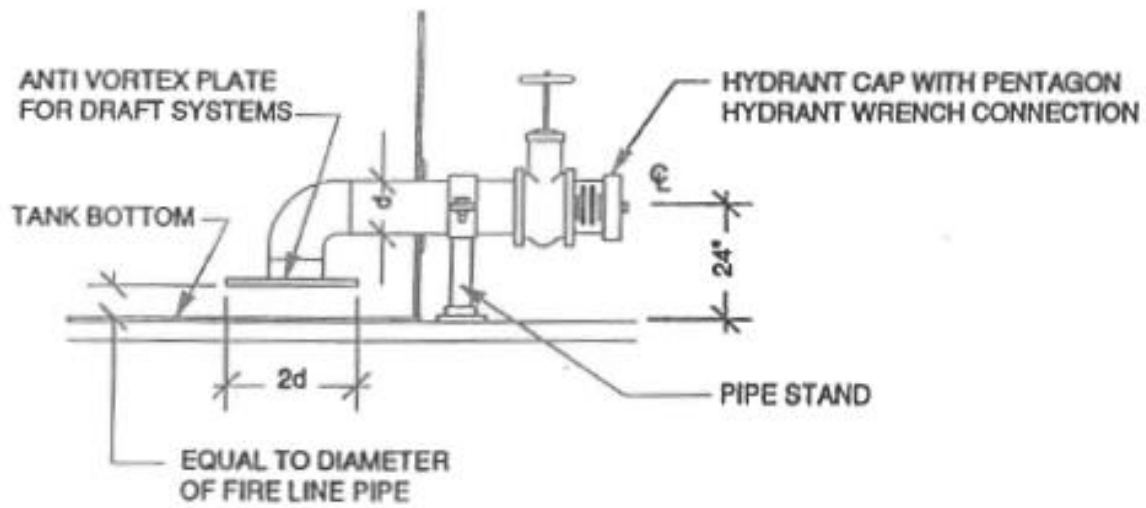
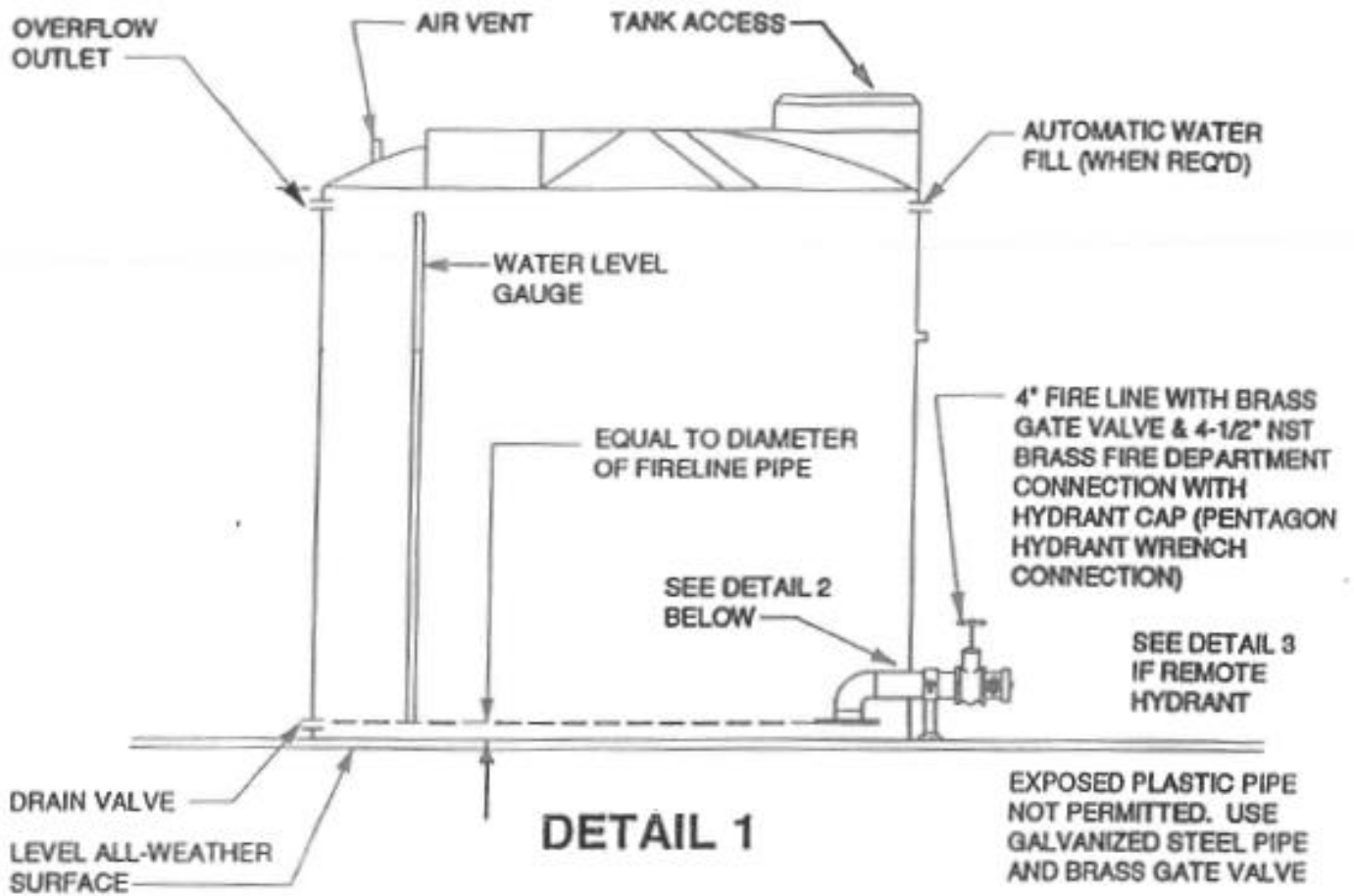
1. The owner contractor shall submit tank specification and piping plans to the Fire District for review and approval prior to installation. Complete information regarding the piping from the tank to the pumper connection shall be provided. The plans must be scaled and shall include the following information:
 - a. All existing and proposed structures
 - b. Access roads with width and grade percentage indicated
 - c. Proposed tank size and location
 - d. Tank manufacturers listed specifications
 - e. Elevation view indicating points of connection to the tank, vent and overflow outlets, water level gauge, and auto-fill connections
 - f. Type, size, and location of all piping
 - g. Auto-fill system specifications
 - h. Proposed pumper connection location
 - i. If the tank is remotely located, show the elevations and number of feet from the pumper connection
 - j. Location of thrust blocks or mechanical joint restraints if applicable

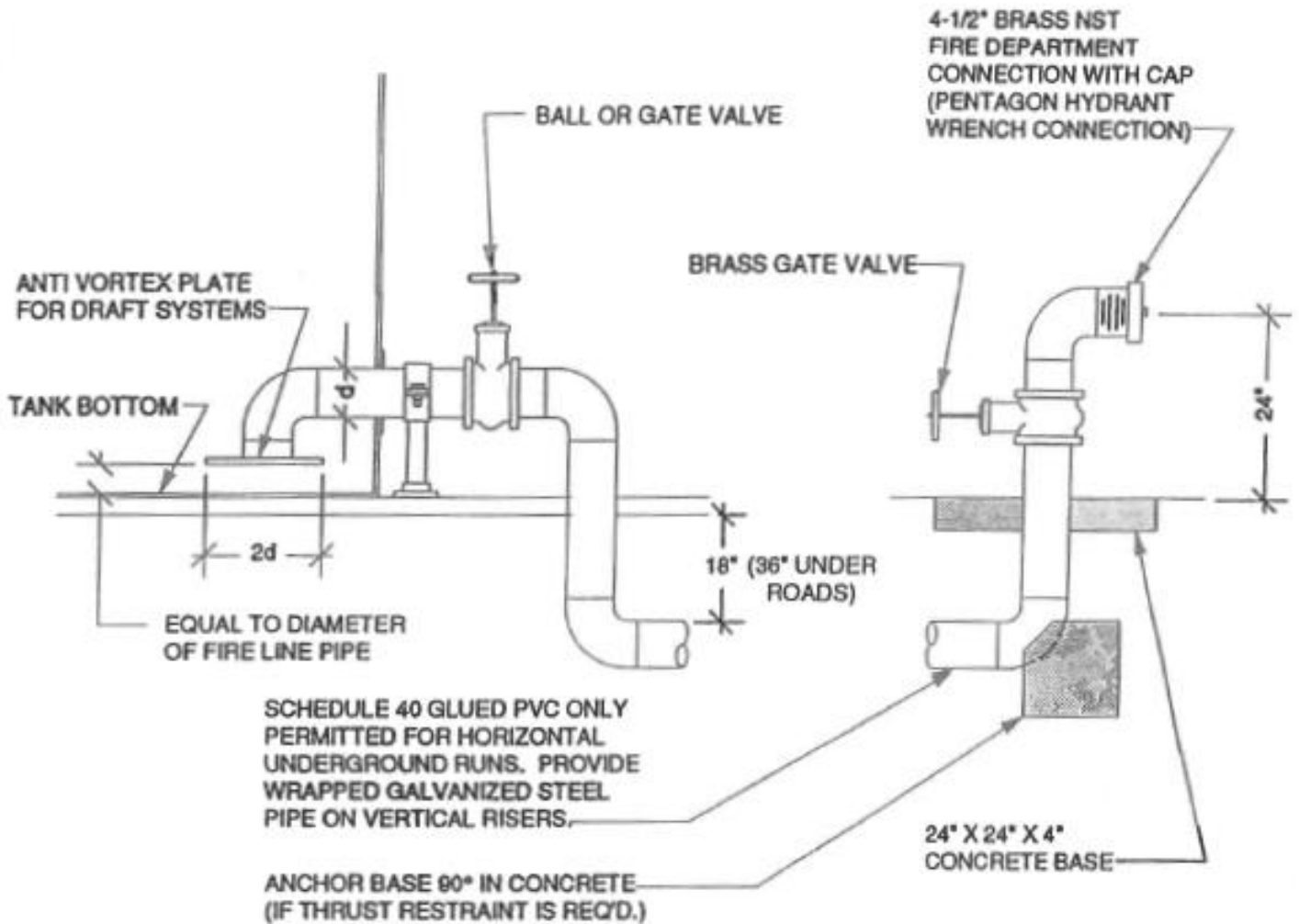
Inspection Requirements

1. Visual: All below ground piping shall have a visual inspection prior to being covered. All tanks shall have a visual inspection prior to being filled.
2. Hydro: Underground piping shall be pressurized to 200psi for 2 hours
3. Flush: Supply piping from the tank to the pumper connection shall be flushed.
4. Final: Final inspection will check all components of the system including the auto-fill system.

Residential Water Supply Tank



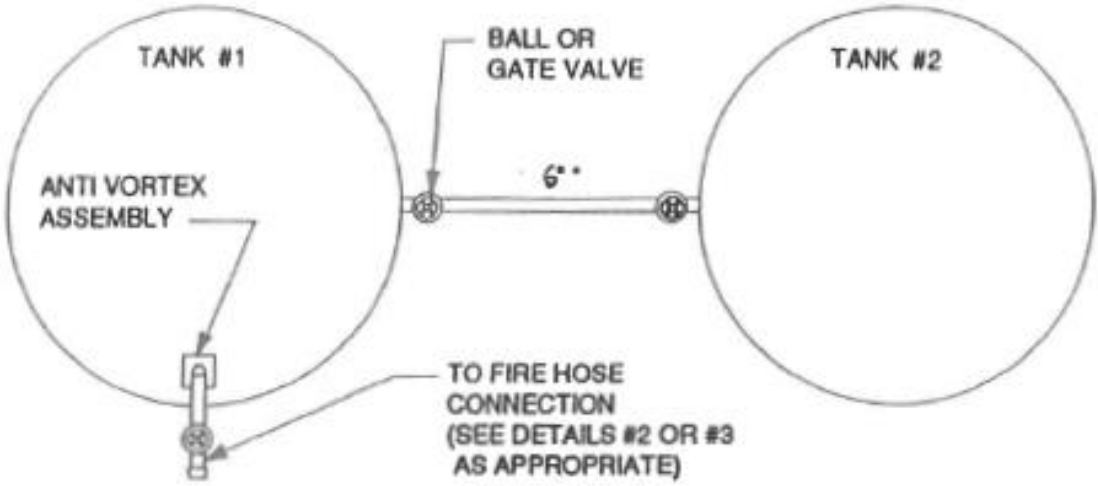




NOTE: PIPE SIZE AND THE MAXIMUM HYDRANT DISTANCE FROM THE WATER TANK IS BASED ON HYDRAULIC CALCULATIONS.

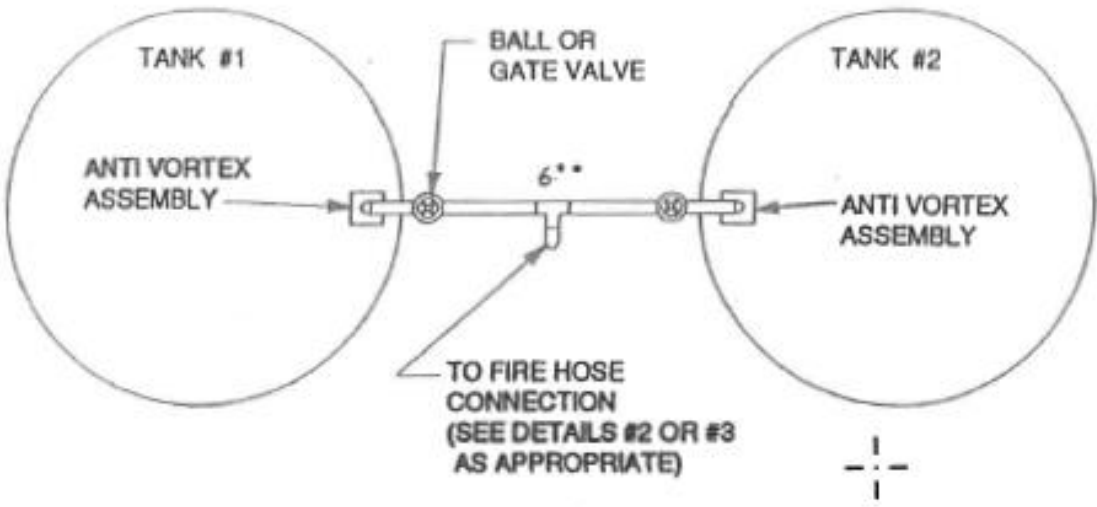
DETAIL 3

LOCATE BOTH TANKS AT THE SAME LEVEL



DETAIL 4

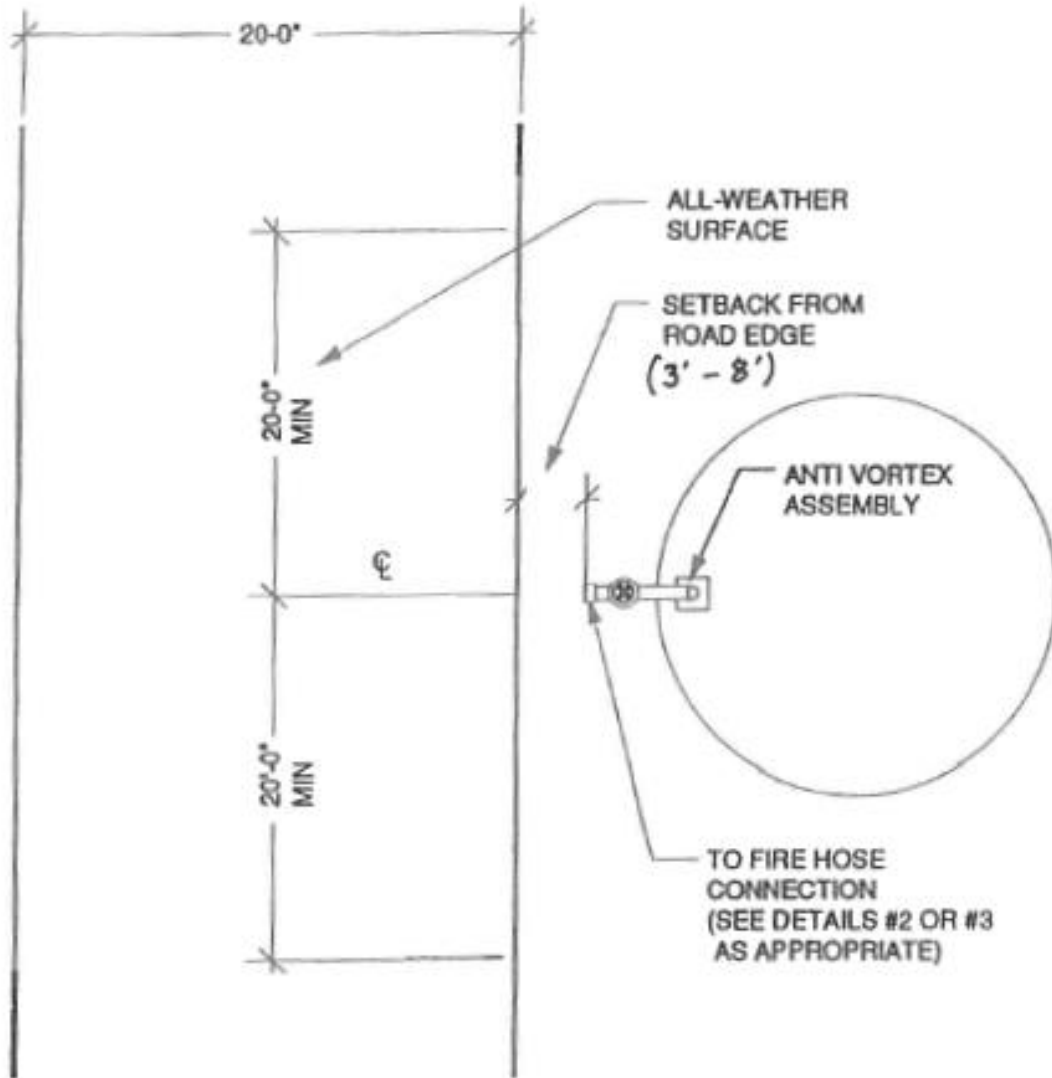
LOCATE BOTH TANKS AT THE SAME LEVEL



* NOTE: PIPE SIZE AND THE MAXIMUM HYDRANT DISTANCE FROM THE WATER TANK IS BASED ON HYDRAULIC CALCULATIONS. EXPOSED PIPE MUST BE STEEL - UNDERGROUND MAY BE PVC.

DETAIL 5

FIRE ACCESS TO DRAFT HOSE CONNECTION



FIRE HOSE CONNECTION ACCESS ROAD AND
FIRE OPERATION AREA

DETAIL 7