

TANKS AND RESERVOIRS FOR INTERCONNECTED FIRE SERVICE AND PUBLIC MAINS

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1.0 SCOPE

This data sheet discusses tanks and reservoirs for potable water where connections exist between the fire service mains of a property and public water mains.

For additional details on fire protection water storage tanks and reservoirs, refer to Data Sheet 3-2, *Water Tanks for Fire Protection*, Data Sheet 3-4, *Embankment-supported Fabric Tanks*, and Data Sheet 3-6, *Lined Earth Reservoirs for Fire Protection*, and the Factory Mutual Research *Approval Guide*, Fire Protection Section.

1.1 Changes

January 2000. This revision of the document has been reorganized to provide a consistent format. The title of this document was changed and the Support for Recommendations section was added.

2.0 LOSS PREVENTION RECOMMENDATIONS

2.1 Introduction

2.1.1 When planning a new tank or reservoir for potable water or when altering an existing facility for potable water use, the plans and specifications should be reviewed and approved by the authority having jurisdiction.

2.2 Construction and Location

2.2.1 Include the following features in the design of covered aboveground, partially buried, or buried potable water tanks:

- a) Substantial watertight steel or concrete construction.
- b) Screened overflow drains and vents to prevent entrance of rodents, birds, and insects.
- c) Overflow drains discharging to atmosphere and not through closed piping into sewer systems. (Direct discharge into dry wells not exposed to soil contamination is sometimes accepted.)
- d) Positive head at ground level maintained in partially buried covered tanks.
- e) Fill pipes discharging through air gaps over the top for buried and partially buried tanks.
- f) For buried tanks, access openings extending to a safe elevation above ground and above flood level.

2.2.2 The construction of the tanks and reservoirs used for the storage of fire protection water should comply with state or provincial and local requirements.

2.3 Protection

2.3.1 The cross connection between the fire service of a property and the public mains should be installed, tested, and maintained in accordance with Data Sheet 3-3, *Cross Connections*.

3.0 SUPPORT FOR RECOMMENDATIONS

3.1 General

Fire pump suction tanks and reservoirs of potable water are subject to regulations of health or water department authorities at properties having fire service connections to public water mains. Covered above-ground tanks (Fig. 1) are preferred and should be recommended. Partly or completely buried tanks are acceptable (Figs. 2 and 3) when permitted by the authority having jurisdiction. Open tanks (Fig. 4) or reservoirs are not permitted by most authorities.

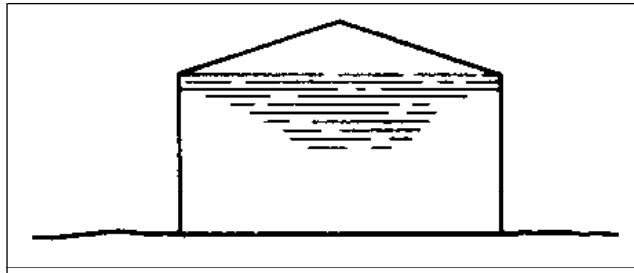


Fig. 1. Covered aboveground tank.

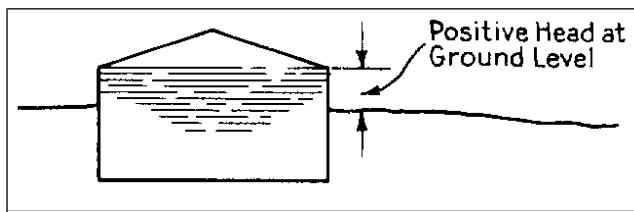


Fig. 2. Covered partly buried tank.

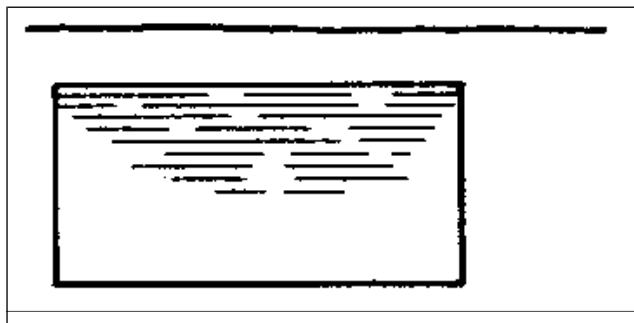


Fig. 3. Buried tank.

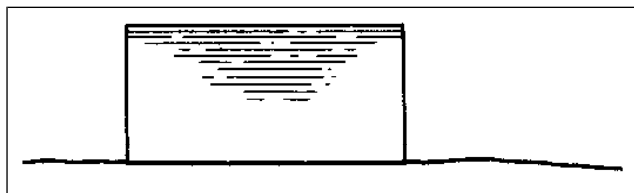


Fig. 4. Open aboveground tank.

4.0 REFERENCES

4.1 FM Global

Factory Mutual Research Approval Guide, Fire Protection Section.

Data Sheet 3-2, *Water Tanks for Fire Protection*.

Data Sheet 3-3, *Cross Connections*.

Data Sheet 3-4, *Embankment-supported Fabric Tanks*.

Data Sheet 3-6, *Lined Earth Reservoirs for Fire Protection*.

APPENDIX A GLOSSARY OF TERMS

Air gap (AG): the unobstructed vertical distance through free atmosphere between the lowest opening from any pipe or faucet conveying water or waste to a tank, plumbing fixture, receptor, or other assembly and the flood level rim of the receptacle. These vertical, physical separations must be at least twice the diameter of the water supply outlet, never less than 1 in. (25 mm). Local codes and regulations may have more stringent requirements.

Buried tanks: a tank which is entirely below grade.

Covered aboveground tanks: a tank which has a roof, and a flat bottom which generally rests on a reinforced concrete ringwall or a continuous reinforced concrete slab.

Covered partly buried tanks: a tank which has a roof, and is partly below grade.

Cross connection: a connection or a potential connection between any part of a potable water system and any other environment containing other substances in a manner that, under any circumstances, would allow such substances to enter the potable water system. Other substances may be gases, liquids, or solids, such as chemicals, water products, steam, water from other sources (potable or nonpotable), or any matter that may change the color or add odor to the water.

Bypass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or any other temporary or permanent connecting arrangement through which backflow may occur are considered to be cross connections.

Open aboveground tanks: a tank which does not have a roof to keep debris out, has a flat bottom which generally rests on a reinforced concrete ringwall or slab, and is completely above grade.

Potable water: water that is safe for human consumption as described by the public health authority having jurisdiction.

Ringwall: a circular reinforced concrete foundation wall, usually about 12 in. (0.3 m) thick, extending several feet (1 to 2 m) below grade and approximately centered beneath the tank wall.

APPENDIX B DOCUMENT REVISION HISTORY

December 1968. The data sheet was revised and the title was "Tanks and Reservoirs for Potable Water".

May 1981. Title changed to "Fire Service Tanks and Reservoirs for Potable Water".

FMELPC March 1981