

SUCTION TANK OVERFLOW FOR PRIVATE FIRE PROTECTION SYSTEMS

SCOPE

This Information Bulletin applies to the installation of overflows in suction tanks. Gravity and pressure tanks are beyond the scope of this bulletin.

BACKGROUND

Aging buildings have had failures in the fill line solenoid valve resulting in flooding the pump room and the basement. The termination of the overflow has become a major issue and must be addressed early in the design phase.

DEFINITIONS

1. **Gravity Tank:** A tank that can provide the needed supply without the use of a pump. All the energy for the system is available from the height of the gravity tank.
2. **Pressure Tank:** A tank that can provide the needed supply without the use of a pump. All the energy for the system is available from the air pressure in the pressure tank.
3. **Suction Tank:** a tank installed in combination with a pump. The required energy for the system is provided by the pump.
4. **Sewage Ejector System:** A system used to lift the discharge from the fixtures located below the crown level of the sewer to the building drain or building sewer.
5. **Sump Pump System:** A system used for removing water from rainwater drains, subsoil drainage, emergency drains, or other systems not considered sewage.

I. DISCHARGE LOCATION

The overflow from the tank may discharge to the storm drain, under the street curb, the yard, the sewer, or any other location approved by the Department subject to the following conditions:

1. Discharge to the street curb or public storm drain is subject to the approval from the Bureau of Engineering, Department of Public Works.
2. When discharging to the yard, attention shall be paid not to let water sheet flow over the public sidewalk.

3. When discharging to the sewer, attention needs to be paid to the sizing of the piping collecting the discharge from the overflow. The overflow is equivalent to two fixture units for every gallon per minute of discharge (Los Angeles Plumbing Code Section 94.703.2). The building sewer shall be sized for the waste of the building and for the overflow discharge. Since the overflow is not discharged during normal operation, make sure that the minimum flow requirements are met with only the waste from the building. Additionally, to prevent the sewer from being pressurized, the overflow discharge shall be added to the fixture unit load of the building when sizing the building sewer.

Alternatively, one can install a dedicated building sewer designed for the overflow.

A. Tanks above Grade or Outside the Building

Whenever possible, the overflow drain shall terminate outside of the building by gravity. Otherwise, a pump system shall be required.

B. Tanks below Grade inside the Building

1. When the tank is installed in the basement, the overflow may drain to a sump, from where it can be pumped to the storm drain, under the curb, the yard, the sewer, or any other location approved by the Department.
2. The sump system, when properly designed, may also receive water from garage drains.

II. OVERFLOW PIPING

A. Materials

The overflow piping shall be made of materials approved for fire protection systems.

B. Slope

Overflow piping shall not be installed in such a way to trap water. The overflow piping may be installed upward if:

1. The roof of the tank is water tight, and
2. The termination of the tank vent is above any point of the overflow piping, and
3. A structural engineer has determined that the tank, including the roof, can withstand the weight of the water at the maximum pressure that the system can experience. In absence of pressure regulators, such a pressure is the high pressure in the city main plus the pressure due to difference in elevation between the meter and the roof of the tank. Alternatively, the maximum pressure that the tank will experience may be calculated with recognized engineering methods.

C. Termination

When the overflow piping terminates inside the building, it shall be connected to the drainage piping by means of a funnel type air-gap fitting, which is connected to a pipe having at least twice the cross sectional area of the overflow pipe. Alternatively, the overflow may terminate to a hub drain.

Overflow pipe	Drain downstream of the funnel air-gap
Nominal Pipe Size (cross sectional area)	Nominal Pipe Size (cross sectional area)
3" (7 in ²)	5" (19.6 in ²) minimum
4" (12.6 in ²)	6" (28 in ²) minimum
6" (28 in ²)	10" (78.5 in ²) minimum
8" (50.3 in ²)	12" (113.1 in ²) minimum
10" (78.5 in ²)	15" (176.7 in ²) minimum

D. Drainage Piping

1. Drainage and venting piping materials, shall comply with Chapter 7 and 9 of the Los Angeles Plumbing Code.
2. If the overflow discharges to the sewer, or to a sewage ejector, the air-gap shall be trapped and vented, and the trap shall be connected to a trap primer.
3. If the overflow discharges to another system, the design shall comply with the requirements of such system.

III. SUMP PUMP SYSTEM

A sump pump system consists of three components: the drainage piping, the basin, and the pumps.

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A. Drainage Piping

1. The sump system shall be designed in accordance with the requirements of Chapter 7 of the Los Angeles Plumbing Code, except the sump vent may terminate in the garage, at least 6" above the air-gap, or the flood level of the highest fixture served if all the following conditions are met:
 - a. The sump receives water from the tank overflow or from the tank overflow and emergency drains.
 - b. The sump does not discharge to the sewer.
2. The size of the vent shall be in accordance with Table 703.2 of the Los Angeles Plumbing Code, based on two fixture units for every gallon per minute of the discharge capacity of the pump.
3. The sump discharge shall terminate into a gravity line through a wye branch fitting.

B. Basin

1. Basins shall be constructed of concrete or metal. Fiberglass or other materials approved by the Los Angeles Mechanical Testing Laboratory, or other City of Los Angeles recognized listing agency, may also be used.
2. For basins constructed of poured concrete, the bottom shall be adequately reinforced and designed to recognized acceptable standards (Public Works standards) and a building permit may be required.
3. Metal basins shall have a minimum thickness of 12 gage, and shall be treated internally and externally to resist corrosion.
4. Fiberglass basins shall be installed in accordance with their conditions of approval; and when installed below grade, they shall be installed on a level four inch concrete slab.
5. All sump basins shall have a water tight cover.
6. The sump basin may also receive water from subsurface drainage, emergency drains, and garage trench drains.
7. If the sump serves multiple systems, backwater valves shall be installed where necessary to prevent flooding in case of failure of the sump pumps or stoppage in the piping.

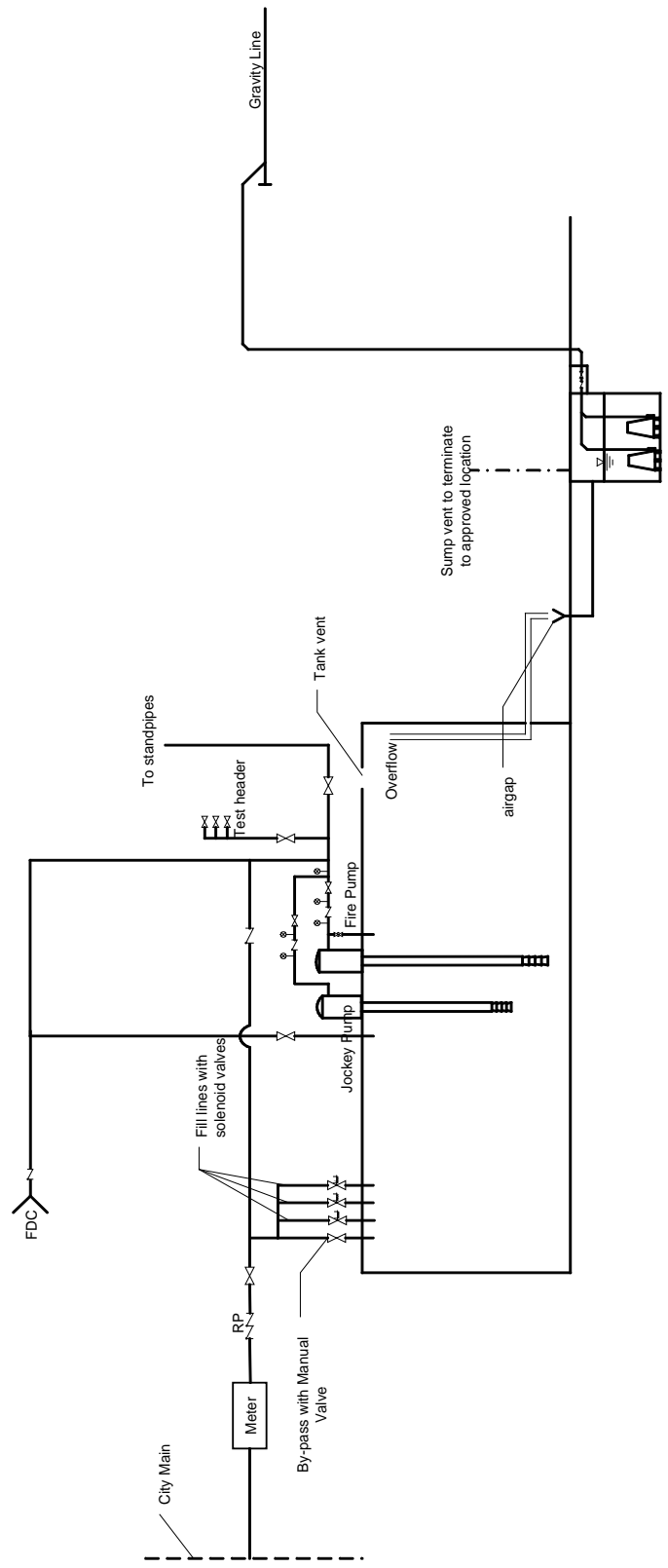
C. Pumps

1. Explosion proof pumps are required when used in areas that may contain an explosive atmosphere, such as parking garages or methane zones. Explosion proof pumps shall be listed as type Class 1 Division1. (National Electrical Code Section 501)
2. Sumps shall be provided with dual pumps. Each pump shall be sized for the entire load.

3. The pump shall be sized based on the expected flow in the event the fill line valve fails to close.
4. When multiple fill lines are installed, the pump may be sized based on the failure of the largest fill valve serving the tank.
5. When the sump serves more than one system, the sump pump shall have enough capacity to discharge the maximum volume of water flowing from all systems simultaneously.

D. Maintenance Affidavit

The owner of the building shall record in the office of the County Recorder an affidavit regarding the maintenance of the sump pump.



This schematic is one of the many ways that the fill line and the overflow can be installed, and it is intended as a visual aid to the Information Bulletin. Fill line and overflow installations different than this schematic are acceptable, as long as they comply with the requirements of the code and the guidelines written in this Information Bulletin.

Recorded at the request of and mail to:

(Name)

(Address)

Date of Recording:

SPACE ABOVE THIS LINE IS FOR RECORDER'S USE

FOR CARTOGRAPHER'S USE ONLY

Owner's Name(s): _____ (Please type or print) _____ (Please type or print)
Signature of Owner(s) _____
Corporate Officer's Signature Required for Corporation _____ (sign) _____ (print Title of Officer)
Name of Corporation: _____

SIGNATURES MUST BE NOTARIZED

(STATE OF CALIFORNIA, COUNTY OF _____)

On _____ before me _____, personally appeared

_____, personally known to me (or provided to me the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they execute the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

Signature _____

FOR DEPARTMENT USE ONLY

MUST BE APPROVED BY Dept. of Building and Safety prior to recording Covenant for City Department: _____ (To be completed for City-owned property only.)

APPROVED BY: _____ Date: _____ (Print and Sign)

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