

STANDPIPE AND HOSE SYSTEMS

	CONTENTS	PAGE
1.	GENERAL	1
2.	STANDPIPES	1
3.	HOSE STATIONS	5
4.	WATER SUPPLY AND PIPING	6
5.	MAINTENANCE	8

1. GENERAL

1.01 This practice outlines arrangements for the installation of standpipe and hose systems in new telephone buildings.

1.02 This issue includes a general revision of the practice. Marginal arrows indicating changes in the text are omitted in this issue because of the general revision of the text.

1.03 The codes, ordinances and recommendations contained in this practice are based in general on the standards of the National Board of Fire Underwriters and of the National Fire Protection Association. Where local or State regulations require higher degrees of protection than those recommended in this practice, those regulations should be followed. Additional information pertinent to standpipe and hose systems is available in the following pamphlets:

Standards of the National Board of Fire Underwriters

- No. 14 Standpipe and Hose Systems.
- No. 20 Installation and Operation of Centrifugal Fire Pumps.
- No. 22 Water Tanks for Private Fire Protection Service.
- No. 23 Fire Department Hose Connections for Sprinkler and Standpipe.
- No. 26 Supervision and Care of Valves Controlling Water Supplies for Fire Protection.

Recommendations of the National Fire Protection Association

No. 198 Care of Fire Hose.

1.04 *Approved:* The word "approved" as used in this section means conformance with Underwriters Laboratories Inc. specifications.

1.05 *Combined Standpipe:* The term "combined standpipe" for the purpose of reference and use in this practice shall mean: "A standpipe installed and sized to provide a water supply both to the 1-1/2-inch first aid hoses which are furnished as part of the system and to the 2-1/2-inch hose outlets to which Fire Department hoses may be attached.

1.06 *Application:* Standpipe and hose equipment is intended for use on interior fires should they reach such proportions they can not be extinguished with portable fire extinguishers. The 1-1/2-inch hose lines are first aid devices for use by the occupants of the building. The 2-1/2-inch hose lines are for Fire Department use, since its personnel are trained in the use of large fire streams. Hose at stations on the roof, where provided, are for use on cooling towers and for the protection of the telephone building against fires in nearby properties. Hose lines are not used on small incipient fires or on live electrical equipment such as power boards, radio, TV, power plant apparatus or elevator machinery.

1.07 *Installation:* The installation of standpipe and hose equipment is to be completed promptly as the building construction work progresses so the equipment will be available for use. See BSP H41.040, FIRE PROTECTION DURING CONSTRUCTION.

2. STANDPIPES

2.01 *General:* Some of the recommendations in the following paragraphs are less restrictive than those appearing in previous issues of this practice. The primary reasons for this are that the provision of an adequate number of portable fire extinguishers, training employees in their use, a continuous program of

SECTION H43.210

fire prevention education, and prompt action by employees in cases of fire have had the effect of minimizing the occasions where the use of the first aid fire hose is required.

2.02 The recommendations should be tempered by good judgment after consideration of the following factors:

- (a) The external fire exposure to the building.
- (b) The prompt availability of an adequate local Fire Department and, in rural areas, road accessibility and fire hydrant location.
- (c) The relative importance of the building considered in terms of service essential and restoration time if interrupted by fire.
- (d) Extent of combustible material in the building.
- (e) Data and assistance in the evaluation of the above factors may be procured through the advisory services of Marsh and McLennan, Inc.

2.03 *Types of Standpipes:* For the purpose of this practice, standpipes are defined as follows:

- (a) A first aid standpipe is one installed and sized to provide a water supply to 1-1/2-inch first aid hoses only.
- (b) A Fire Department standpipe is one installed and sized to provide a water supply to 2-1/2-inch hoses for use by the Fire Department.
- (c) A combined standpipe is one installed and sized to provide a water supply to 1-1/2-inch first aid hoses which are furnished as part of the system and to 2-1/2-inch hose outlets to which Fire Department hoses may be attached.

2.04 *Where to Install Standpipes:* First aid standpipes should be considered for telephone buildings of one story or higher when they house equipment or records which are of prime importance to the internal affairs of the company or to the rendering of essential telephone service. No exact yardstick is suggested to measure the phrase of "Prime Importance" but a few examples are as follows:

- (a) A telephone equipment building housing an initial or ultimate installation of more than 5000 lines of local service.

- (b) A telephone equipment building housing an important toll service.

- (c) A telephone equipment building housing a local service associated with a Government activity or project.

- (d) A nonequipment telephone building housing an accounting center whose records and machines are essential to the internal affairs of the company.

2.05 First aid standpipes may be required in telephone buildings one, two or three stories in height when the factors in 2.02 or 2.04 are considered.

2.06 Combined standpipes are recommended for telephone buildings over three stories in height.

2.07 Future additional stories are considered in determining the type of standpipe system and the size of the standpipes, unless it should appear to be economical in a specific case to replace the initial installation with a larger size or supplement it with other standpipes in connection with the building extension.

2.08 *Number of Standpipes:* The number of first aid standpipes for 1-1/2-inch hose or combined standpipe in each building or section of a building within fire walls is in general such that all portions of each story of the building except cable vaults, transformer vaults or power boards are within 20 feet of a nozzle attached to not more than 75 feet of 1-1/2-inch hose connected to the standpipe or to a standpipe lateral. To avoid extensive structural changes in an existing building when alterations are made, the recommended hose length may be increased to 100 feet.

2.09 *Size of Standpipes:* First aid standpipes should not be less than 2-1/2 inches in size.

2.10 Combined standpipes should be not less than 4 inches in size in four-story and five-story equipment buildings and not less than 6 inches in size in buildings six stories and higher. In nonequipment buildings combined standpipes should be not less than 4 inches in size in five-story and not exceeding six-story buildings and not less than 6 inches in buildings exceeding six stories.

2.11 Location of Standpipes: First aid standpipes may be located in the areas to be protected, if this appears desirable to reduce lateral piping runs.

2.12 The recommended location for a combined standpipe is one that affords the best possible protection against exterior and interior fire exposure and mechanical damage. The outlets should be within stairway enclosures, as near the stairway as possible or outside or immediately inside of the exterior walls within one foot of a fire tower or exterior stairway or fire escape.

2.13 Hose Connection on Roof: Hose connections on the roof are not provided on first aid standpipe systems. If combustibles are on the roof and a combined standpipe system is in use, the standpipes are extended through the roof and outlet valves are installed. The hose connection should preferably be located in a heated space such as a penthouse. If this is not feasible, then an arrangement such as shown in Fig. 1 may be used. The automatic drip valve is provided to prevent freezing. Municipal regulations

may require a manifold with three hose connections fed from the same standpipe as shown in Fig. 2. The lateral piping to a hose connection on the roof is 2-1/2 inches in size. Hose should not be installed at these connections unless required by local or State ordinance or law. The thread on the valved outlet must be compatible with those used by the Fire Department that would normally respond to an alarm.

2.14 Siamese Connections: An outside building Siamese or manifold connection for use by the Fire Department should be provided for standpipes 4 inches and larger. It is to be located on the street wall at a height between 18 inches and 36 inches above grade. Municipal regulations in some cases require a Siamese connection for each street if the building involves more than one street frontage. Each Siamese connection is provided with an approved straightway check valve located in the building. No gate valve is provided. Piping between the check valve and the Siamese connection is arranged to drain automatically. The pipe from the standpipe to the Siamese connection should be at least 4 inches in diameter. See Fig. 3.

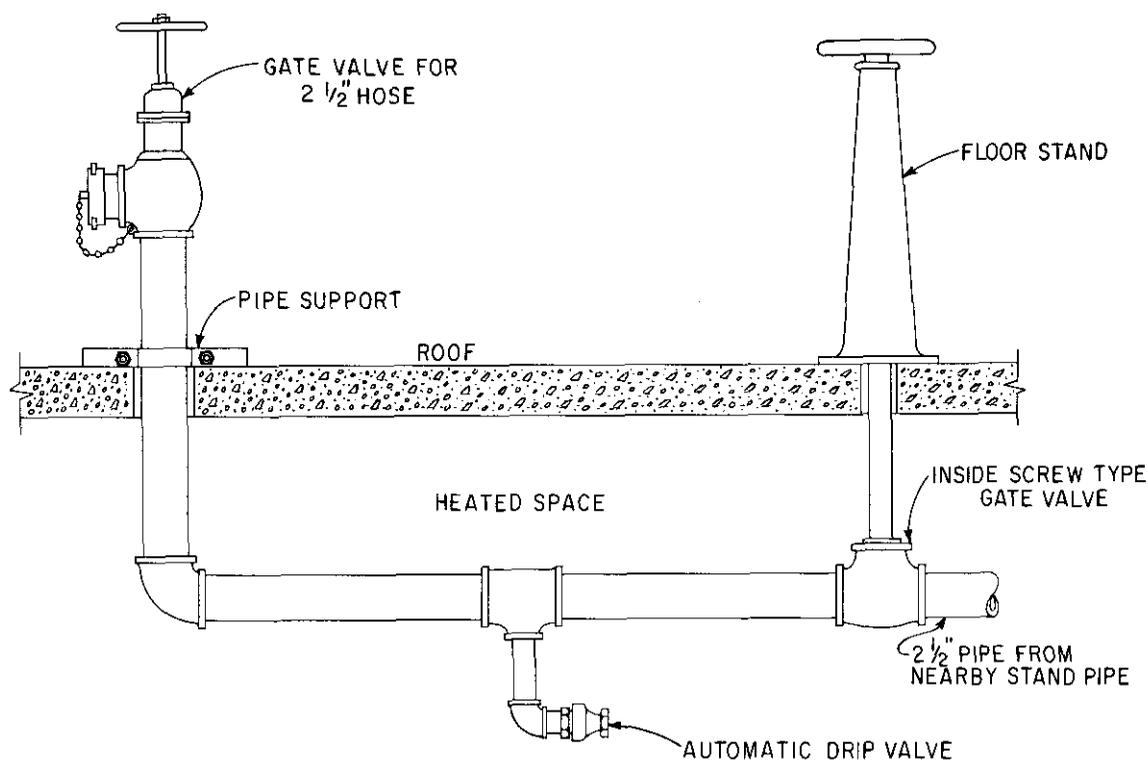


Fig. 1

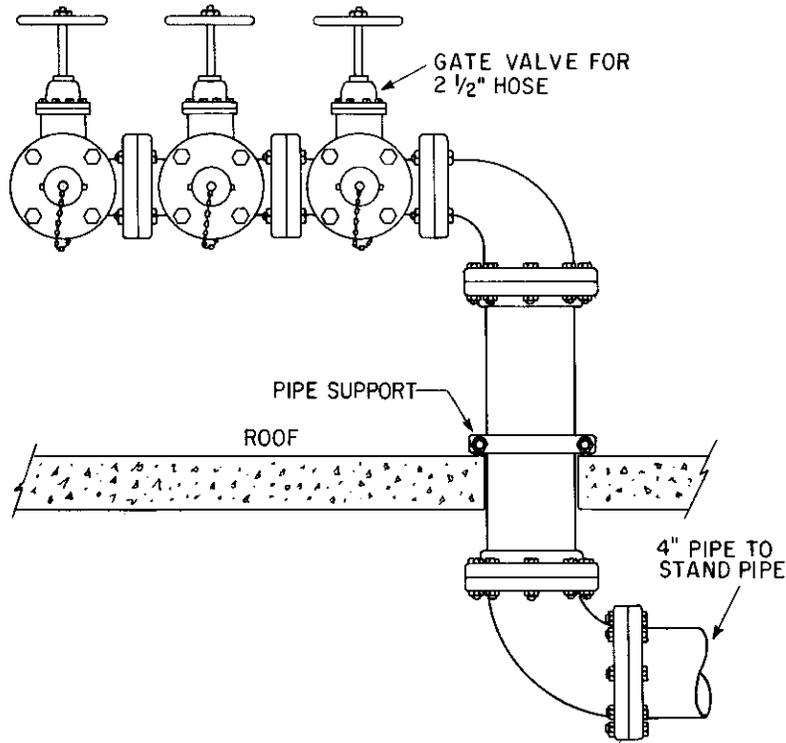


Fig. 2

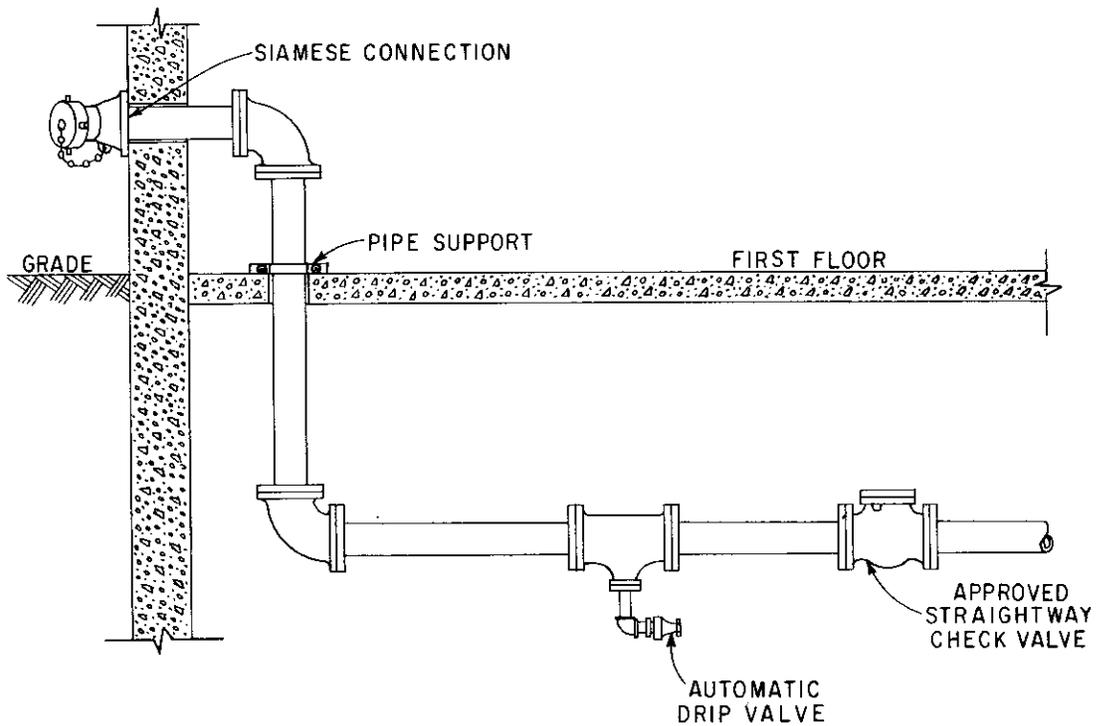


Fig. 3

3. HOSE STATIONS

3.01 *Locations of Hose Stations:* The 1-1/2-inch hose stations are generally located near the standpipe usually in the space to be protected. In equipment rooms consideration should be given to locating the hose station outside the equipment area if corridors or other nonequipment areas are nearby. The stations should also be kept outside stairways or fire towers as this arrangement permits prompt use of the hose stream without interference with people leaving the building via the stairway. Each 1-1/2-inch hose station inside the building is connected by lateral piping not less than 1-1/2 inches in size to all sizes of standpipes.

3.02 Hose stations must be within reach of a person standing on the floor and as a maximum are not more than six feet from the floor. They are located conspicuously and where it is unlikely they will be obstructed.

3.03 *Fire Department Standpipe Connection:*

Although a Fire Department 2-1/2-inch valved outlet is provided at each floor on standpipes 4 inches and larger, the 2-1/2-inch hose should not be installed, unless required by local or State ordinance or law. The thread on the outlet must be compatible with those used by the Fire Department that would respond to an alarm.

3.04 *Hose:* Each first aid hose station inside the building, regardless of the size of standpipe, is equipped with 1-1/2-inch approved unlined linen hose. Rubber-lined hose is not used as it must be stored away from heat and should have water passed through it at least four times a year to keep the rubber lining in good condition.

3.05 When it is required that 2-1/2-inch hose be installed approved unlined linen hose should be provided.

3.06 When regulations require that hose be installed at the roof connection a sufficient length should be provided to reach all edges of the roof. To facilitate handling, the hose may be made up in sections with no section being more than 100 feet in length. The hose should be coupled to the hose valve if located in the penthouse or other heated space. If necessary to use the arrangement shown in Fig. 2, the hose should be located in an easily accessible hose cabinet in the heated space.

3.07 *Hose Racks:* Each 1-1/2-inch hose station is provided with an approved rack securely fastened in position. Racks and valves may be recessed in the wall, provided the walls of a fire cutoff are not reduced in effective thickness. If a door is used to protect the rack from dust, it should be nonlocking and the words "FIRE HOSE" placed on the door.

3.08 When regulations require that 2-1/2-inch hose be installed, an approved rack is provided as for 1-1/2-inch hose unless the installation is in a closet, when it may be stored on a shelf. At each location of 2-1/2-inch hose, a sign should be placed reading "FOR FIRE DEPARTMENT USE ONLY — DANGEROUS."

3.09 *Hose Valves:* The hose at each station is coupled to an approved hose valve. Where the normal static pressure at any hose outlet for 1-1/2-inch hose exceeds 50 pounds psi an approved device is provided at each hose outlet valve for reducing the pressure to such a valve that the nozzle flowing pressure will not exceed 50 psi. The pressure regulating device should preferably be of the adjustable type. Each hose valve for 1-1/2-inch hose on a wet pipe system should be provided with a suitable open drip or automatic connection so installed that any slight leakage past the valve seat will be carried off and prevented from entering the fire hose. Care is taken to avoid contact with polish, oils, or wetting the stored linen hose inasmuch as this type of hose is subject to rot or mildew. The danger of the hose becoming wet while on the rack also can be avoided by having the hose placed entirely above the outlet (coiled upward instead of downward) with a pin hole on the lower side of the nipple for drainage.

3.10 *Nozzles:* Solid stream nozzles for the 1-1/2-inch first aid hose are not to be used in telephone equipment areas, AMA centers, Electronic Data Processing centers, radio or TV or power rooms. Where nozzles of this type are in use within reach of these areas, consideration should be given to relocating them to nonequipment spaces and replacing with a nonadjustable spray-type nozzle as soon as practical. The spray nozzle used should have a nonadjustable spray pattern of 30° or 35° and designed to go from the shut off position to the 30° or 35° pattern without passing through a solid stream. The water pattern should be accomplished by the use of milled teeth at the nozzle tip as this design

SECTION H43.210

prevents clogging and not by the use of a strainer or perforations at the nozzle head. Spray nozzles should be installed on all 1-1/2-inch first aid hoses for new installations.

3.11 A fire hose is not used under any circumstances for purposes other than fire fighting. Violation of this rule may result in hose being missing, defective or useless at time of fire.

4. WATER SUPPLY AND PIPING

4.01 Sources: Standpipes are connected to approved water supply systems capable of providing water continuously at adequate volume and pressure as outlined in the following paragraphs.

4.02 Street Mains: Generally a standpipe water supply is from a municipal street main but if the street main is not capable of providing water at the minimum quantities outlined in subsequent paragraphs one or more methods of augmenting the street main supply is required.

4.03 Character of Water Supply: The recommended design of a water supply system for standpipe and hose is one that provides the following:

(a) An available water supply for 1-1/2-inch hose line streams for use of the building occupants in the initial effort to control a fire. The supply will furnish 70 gallons per minute so as to afford two good first aid streams simultaneously for at least 30 minutes. The pressure is sufficient to provide at least 32-1/2 psi (which allows for a 7-1/2 psi friction loss for 75 feet of hose) at the highest 1-1/2-inch nozzle for use by occupants of a building as first aid fire protection.

(b) A means of obtaining water in sufficient volume and pressure to furnish the number of streams required for the full protection of the building for at least 30 minutes. The supply will furnish 250 gpm for a combined standpipe and 500 gpm for two or more standpipes with pressure at the highest hose outlet of 50 psi.

4.04 Other Water Systems: To provide the character of water supplies previously outlined or augment the available water supply to achieve the required minimum quantities, the following acceptable water supplying systems may be used:

(a) Gravity tank. (Where the height of the tank necessary to achieve the minimum requirement would not be prohibitive.)

(b) Pressure tank.

(c) Fire pumps where the volume of water at the street main is sufficient.

(d) Ground level suction tank with booster fire pump.

(e) Deep well with vertical shaft pump.

See Standards for the Construction and Installation of Water Tanks for Private Fire Protection (NBFU Pamphlet #22) and Standards for the Installation of Centrifugal Fire Pumps (NBFU Pamphlet #20).

4.05 The connection at the street water main is 4 inches for the 4-inch standpipe and 6 inches for the 6-inch standpipe. If permitted by the local water company, connect the standpipe water supply so that it bypasses the water meter. See Fig. 4.

4.06 Gate Valves: All gate valves supplying the standpipe system should be sealed in an open position.

4.07 Metering: If metering is required, the standpipe system may be metered either separately or as shown in Fig. 5.

4.08 Size of Water Meters: The water meter adds to the total friction loss of water flowing in the standpipe system. In order to maintain the necessary pressure and flow, the meter should be large enough to afford the minimum pressure drop. In locations where a meter system is required by local code or thought desirable, it should be selected only after considering the approximate pressure losses in Table 1 and the water supply's ability to maintain the required pressure.

TABLE 1

Approximate Pressure Drop Through Water Meters (Lb per Sq In.)

METER SIZE	WATER FLOW IN GAL PER MIN		
	140	250	500
3 inch	5	15	60
4 inch	—	6-1/2	25
6 inch	—	1-1/2	6

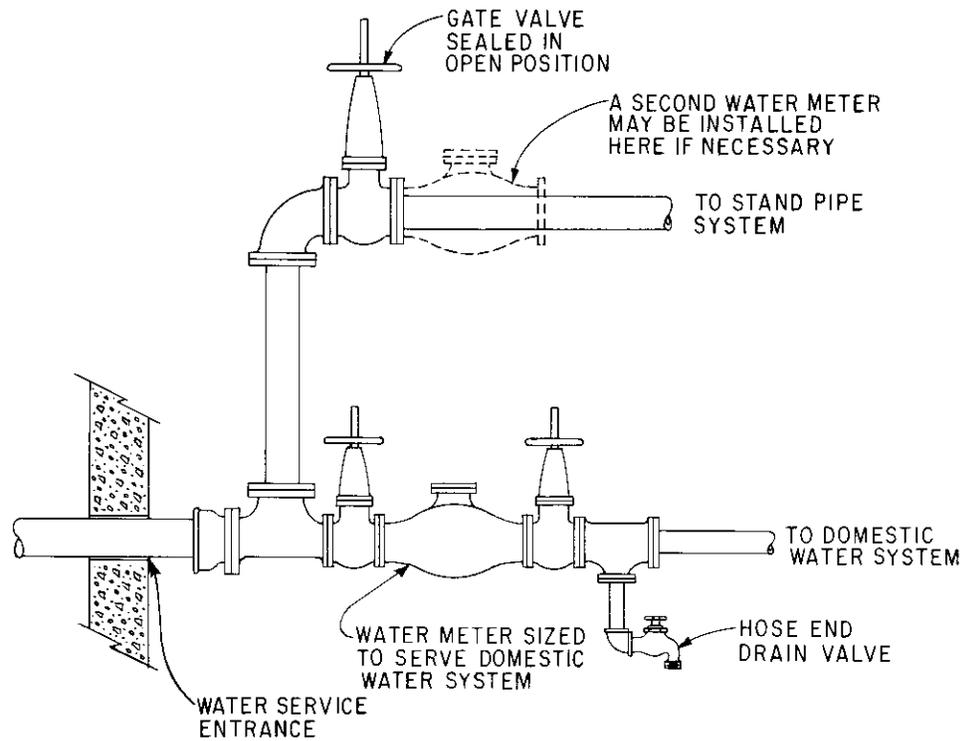


Fig. 4 – Standpipe Bypassing Domestic Water Meter

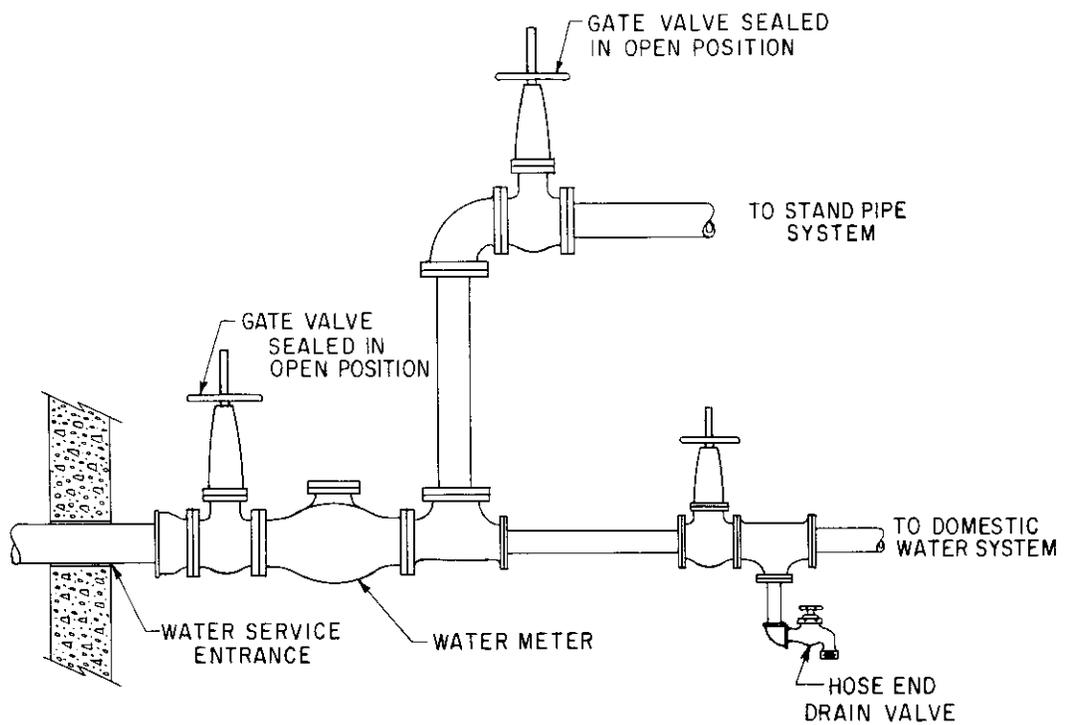


Fig. 5 – Standpipe Connected Through Water Meter

SECTION H43.210

4.09 Rural Restrictions: Special considerations should be given to large buildings located in areas not served by city water or a municipal Fire Department. A standpipe installation equipped with 1-1/2-inch hoses could be installed with a pumping system capable of furnishing water as outlined in Paragraph 4.04 of this section, for minimum supplies for small hoses. This might be accomplished by utilizing the water storage pressure tank of the sanitary system for the building or a roof tank.

4.10 During times when additions are constructed to large buildings in rural areas a standpipe and hose system as described in 4.09

would afford considerable protection at a time when fire hazards are greater. When additions are made to buildings without a standpipe and hose system consideration might be given to the use of a temporary tank truck with an auxiliary pump capable of supplying water to the highest part of the building at a minimum flowing pressure of 25 psi at the nozzle. This would increase the fire protection facilities during the period of construction.

5. MAINTENANCE

5.01 Maintenance and care of Fire Hose and standpipe systems is covered in BSP H44.210 (H54.610).