### 5.1 General.

### 5.1.1 Number of Supplies.

Every automatic sprinkler system shall have at least one automatic water supply.

### 5.1.2 Capacity.

Water supplies shall be capable of providing the required flow and pressure for the remote design area determined using the requirements and procedures as specified in Chapters 19 through 27 including hose stream allowance where applicable for the required duration.

### 5.1.3 * Size of Fire Mains.

#### 5.1.3.1

Except as provided in 5.1.3.2 or 5.1.3.3, no pipe smaller than 6 in. (150 mm) in diameter shall be installed as a private service main.

#### 5.1.3.2

Sizes smaller than 6 in. (150 mm) for fire mains that do not supply hydrants shall be permitted, provided that hydraulic calculations show the main will supply the total demand at the appropriate pressure.

#### 5.1.3.3

Where a single main less than 4 in. (100 mm) in diameter serves both fire systems and other uses, the non-fire demand shall be added to the hydraulic calculations for the fire system at the point of connection unless provisions have been made to automatically isolate the non-fire demand during a fire event.

#### 5.1.3.4

For pipe schedule systems, the underground supply pipe shall be at least as large as the system riser.

### 5.1.4 * Water.

#### 5.1.4.1

Water supplies and environmental conditions shall be evaluated for the existence of microbes and conditions that contribute to microbiologically influenced corrosion (MIC).

#### 5.1.4.2

Water supplies and environmental conditions shall be evaluated for conditions that contribute to unusual corrosive properties.

### 5.1.4.3 * Inhibitors.

#### 5.1.4.3.1

Where used, listed bacterial inhibitors and/or corrosion inhibitors shall be compatible with system components.

#### 5.1.4.3.2

Where used together, listed bacterial inhibitors and corrosion inhibitors shall be compatible with each other.

### 5.1.5 Arrangement.

### 5.1.5.1 Connection Between Underground and Aboveground Piping.

#### 5.1.5.1.1

The connection between the system piping and underground piping shall be made with a transition piece in accordance with 6.3.3 or 6.3.3.1 that is properly strapped or fastened by approved devices.

#### 5.1.5.1.2

Where required due to specific mechanical or environmental conditions, the transition piece shall be protected against possible damage from corrosive agents, solvent attack, or mechanical damage.

### 5.1.5.2 * Connection Passing Through or Under Foundation Walls.

When system piping pierces a foundation wall below grade or is located under the foundation wall, clearance shall be provided to prevent breakage of the piping due to building settlement.

### 5.1.6 * Meters.

Where meters are required by other authorities, they shall be listed.

### 5.1.7 * Connection from Waterworks System.

#### 5.1.7.1

The requirements of the public health authority having jurisdiction shall be determined and followed.

#### 5.1.7.2

Where equipment is installed to guard against possible contamination of the public water system, such equipment and devices shall be listed for fire protection service.

### 5.2 Types.

#### 5.2.1 *

Water supplies for sprinkler systems shall be one of the following or any combination:

(1) A connection to an approved public or private waterworks system in accordance with 5.2.2
(2) A connection including a fire pump in accordance with 5.2.3
(3) A connection to a water storage tank at grade or below grade installed in accordance with NFPA 22 and filled from an approved source
(4) A connection to a pressure tank in accordance with 5.2.4 and filled from an approved source
(5) A connection to a gravity tank in accordance with 5.2.5 and filled from an approved source
(6) A penstock, flume, river, lake, pond, or reservoir in accordance with 5.2.6
(7)* A source of recycled or reclaimed water where the building owner (or their agent) has analyzed the source of the water and the treatment process (if any) that the water undergoes before being made available to the sprinkler system and determined that any materials, chemicals, or contaminants in the water will not be detrimental to the components of the sprinkler system it comes in contact with

### 5.2.2 * Connections to Waterworks Systems.

#### 5.2.2.1

A connection to a reliable waterworks system shall be an acceptable water supply source.

#### 5.2.2.2 *

The volume and pressure of a public water supply shall be determined from waterflow test data or other approved method.

#### 5.2.2.3 *

Where a waterflow test was conducted to provide the water supply information, the date, day of the week, and time of day that the test was conducted shall be recorded with the data.

### 5.2.3 * Pumps.

A single automatically controlled fire pump installed in accordance with NFPA 20 shall be an acceptable water supply source.

### 5.2.4 Pressure Tanks.

### 5.2.4.1 Acceptability.

#### 5.2.4.1.1

A pressure tank installed in accordance with NFPA 22 shall be an acceptable water supply source.

#### 5.2.4.1.2

Pressure tanks shall be provided with an approved means for automatically maintaining the required air pressure.

#### 5.2.4.1.3

Where a pressure tank is the sole water supply, an approved supervisory signal(s) shall be provided to indicate low air pressure and low water level with the signal supplied from an electrical branch circuit independent of the air compressor or, if the building has a fire alarm system, connected to the building's fire alarm system.

#### 5.2.4.1.4

Pressure tanks shall not be used to supply other than sprinklers and hand hose attached to sprinkler piping.

### 5.2.4.2 Capacity.

#### 5.2.4.2.1

In addition to the requirements of 5.1.2, the water capacity of a pressure tank shall include the extra capacity needed to fill dry pipe or preaction systems where installed.

#### 5.2.4.2.2

The total volume shall be based on the water capacity plus the air capacity required by 5.2.4.3.

### 5.2.4.3 * Water Level and Air Pressure.

#### 5.2.4.3.1

Pressure tanks shall be kept with a sufficient supply of water to meet the demand of the fire protection system as calculated in Chapter 28 for the duration required by Chapter 19, Chapter 20, or Chapter 27.

#### 5.2.4.3.2

The pressure shall be sufficient to push all of the water out of the tank while maintaining the necessary residual pressure (required by Chapter 28) at the top of the system.

### 5.2.5 Gravity Tanks.

An elevated tank installed in accordance with NFPA 22 shall be an acceptable water supply source.

### 5.2.6 Penstocks, Flumes, Rivers, or Lakes.

Water supply connections from penstocks, flumes, rivers, lakes, or reservoirs shall be arranged to avoid mud and sediment and shall be provided with approved double removable screens or approved strainers installed in an approved manner.