

**CITY OF SUNNYVALE**

**ENVIRONMENTAL SERVICES DEPARTMENT**



**CROSS-CONNECTION CONTROL PROGRAM**

**POLICIES AND REGULATIONS**

**REV. JULY 2019**

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# **Title 17 Code of Regulations**

**DIVISION 1. STATE DEPARTMENT OF HEALTH SERVICES  
CHAPTER 5. SANITATION (ENVIRONMENTAL)  
GROUP 4. DRINKING WATER SUPPLIES  
ARTICLE 1. GENERAL**

**7583. Definitions**

In addition to the definitions in Section 4010.1 of the Health and Safety Code, the following terms are defined for the purpose of this Chapter

- (a) "Approved Water Supply" is a water supply whose potability is regulated by a State of local health agency.
- (b) "Auxiliary Water Supply" is any water supply other than that received from a public water system.
- (c) "Air-gap Separation (AG)" is a physical break between the supply line and a receiving vessel.
- (d) "AWWA Standard" is an official standard developed and approved by the American Water Works Association (AWWA).
- (e) "Cross-Connection" is an unprotected actual or potential connection between a potable water system used to supply water for drinking purposes and any source or system containing unapproved water or a substance that is not or cannot be approved as safe, wholesome, and potable. By-pass arrangements, jumper connections, removable sections, swivel or changeover devices, or other devices through which backflow could occur, shall be considered to be cross-connections.
- (f) "Double Check Valve Assembly (DC)" is an assembly of at least two independently acting check valves including tightly closing shut-off valves on each side of the check valve assembly and test cocks available for testing the watertightness of each check valve.
- (g) "Health Agency" means the California Department of Health Services, or the local health officer with respect to a small water system.
- (h) "Local Health Agency" means the county or city health authority.
- (i) "Reclaimed Water" is a wastewater which as a result of treatment is suitable for uses other than potable use.

(j) "Reduced Pressure Principle Backflow Prevention Device (RP)" is a backflow preventer incorporating not less than two check valves, an automatically operated differential relief valve located between the two check valves, a tightly closing shut-off valve on each side of the check valve assembly, and equipped with necessary test cocks for testing.

(k) "User Connection" is the point of connection of a user's piping to the water supplier's facilities.

(l) "Water Supplier" is the person who owns or operates the public water system.

(m) "Water User" is any person obtaining water from a public water supply.

#### **7584. Responsibility and scope of program**

The water supplier shall protect the public water supply from contamination by implementation of a cross-connection control program. The program, or any portion thereof, may be implemented directly by the water supplier or by means of a contract with the local health agency, or with another agency approved by the health agency. The water supplier's cross-connection control program shall for the purpose of addressing the requirements of Sections 7585 through 7605 include, but not be limited to, the following elements:

(a) The adoption of operating rules or ordinances to implement the cross-connection program.

(b) The conducting of surveys to identify water user premises where cross-connections are likely to occur,

(c) The provisions of backflow protection by the water user at the user's connection or within the user's premises or both,

(d) The provision of at least one person trained in cross-connection control to carry out the cross-connection program,

(e) The establishment of a procedure or system for testing backflow preventers, and

(f) The maintenance of records of locations, tests, and repairs of backflow preventers.

#### **7585. Evaluation of hazard**

The water supplier shall evaluate the degree of potential health hazard to the public water supply which may be created as a result of conditions existing on a user's premises. The water supplier, however, shall not be responsible for abatement of cross-connections which may exist within a user's premises. As a minimum, the evaluation should consider: the existence of cross-connections, the nature of materials handled on the property, the probability of a backflow occurring, the degree of piping system complexity and the

potential for piping system modification. Special consideration shall be given to the premises of the following types of water users:

(a) Premises where substances harmful to health are handled under pressure in a manner which could permit their entry into the public water system. This includes chemical or biological process waters and water from public water supplies which have deteriorated in sanitary quality.

(b) Premises having an auxiliary water supply, unless the auxiliary supply is accepted as an additional source by the water supplier and is approved by the health agency.

(c) Premises that have internal cross-connections that are not abated to the satisfaction of the water supplier or the health agency.

(d) Premises where cross-connections are likely to occur and entry is restricted so that cross-connection inspections cannot be made with sufficient frequency or at sufficiently short notice to assure that cross-connections do not exist.

(e) Premises having a repeated history of cross-connections being established or re-established.

#### **7586. User supervisor**

The health agency and water supplier may, at their discretion, require an industrial water user to designate a user supervisor when the water user's premises has a multipiping system that convey various types of fluids, some of which may be hazardous and where changes in the piping system are frequently made. The user supervisor shall be responsible for the avoidance of cross-connections during the installation, operation and maintenance of the water user's pipelines and equipment.

### **ARTICLE 2. PROTECTION OF WATER SYSTEM**

#### **7601. Approval of backflow preventers**

Backflow preventers required by this Chapter shall have passed laboratory and field evaluation tests performed by a recognized testing organization which has demonstrated their competency to perform such tests to the Department.

#### **7602. Construction of backflow preventers**

(a) Air-gap Separation. An Air-gap separation (AG) shall be at least double the diameter of the supply pipe, measured vertically from the flood rim of the receiving vessel to the supply pipe; however, in no case shall this separation be less than one inch.

(b) Double Check Valve Assembly. A required double check valve assembly (DC) shall, as a minimum, conform to the AWWA Standard C506-78 (R83) adopted on January 28,

1978 for Double Check Valve Type Backflow Preventive Devices which is herein incorporated by reference.

(c) Reduced Pressure Principle Backflow Prevention Device. A required reduced pressure principle backflow prevention device (RP) shall, as a minimum, conform to the AWWA Standard C506-78 (R83) adopted on January 28, 1978 for Reduced Pressure Principle Type Backflow Prevention Devices which is herein incorporated by reference.

### **7603. Location of backflow preventers**

(a) Air-gap Separation. An air-gap separation shall be located as close as practical to the user's connection and all piping between the user's connection and the receiving tank shall be entirely visible unless otherwise approved in writing by the water supplier and the health agency.

(b) Double Check Valve Assembly. A double check valve assembly shall be located as close as practical to the user's connection and shall be installed above grade, if possible, and in a manner where it is readily accessible for testing and maintenance.

(c) Reduced Pressure Principle Backflow Prevention Device. A reduced pressure principle backflow prevention device shall be located as close as practical to the user's connection and shall be installed a minimum of twelve inches (12") above grade and not more than thirty-six inches (36") above grade measured from the bottom of the device and with a minimum of twelve inches (12") side clearance.

### **7604. Type of protection required.**

The type of protection that shall be provided to prevent backflow into the public water supply shall be commensurate with the degree of hazard that exists on the consumer's premises. The type of protective device that may be required (listed in an increasing level of protection) includes: Double check Valve Assembly--(DC), Reduced Pressure Principle Backflow Prevention Device--(RP) and an Air gap Separation--(AG). The water user may choose a higher level of protection than required by the water supplier. The minimum types of backflow protection required to protect the public water supply, at the water user's connection to premises with various degrees of hazard, are given in Table 1. Situations not covered in Table 1 shall be evaluated on a case-by-case basis and the appropriate backflow protection shall be determined by the water supplier or health agency.

### **Section 7605. Testing and maintenance of backflow preventers**

(a) The water supplier shall assure that adequate maintenance and periodic testing are provided by the water user to ensure their proper operation.

(b) Backflow preventers shall be tested by persons who have demonstrated their competency in testing of these devices to the water supplier or health agency.

(c) Backflow preventers shall be tested at least annually or more frequently if determined to be necessary by the health agency or water supplier. When devices are found to be defective, they shall be repaired or replaced in accordance with the provisions of this Chapter.

(d) Backflow preventers shall be tested immediately after they are installed, relocated or repaired and not placed in service unless they are functioning as required.

(e) The water supplier shall notify the water user when testing of backflow preventers is needed. The notice shall contain the date when the test must be completed.

(f) Reports of testing and maintenance shall be maintained by the water supplier for a minimum of three years.

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**CITY OF SUNNYVALE MUNICIPAL  
CODE  
CROSS-CONNECTIONS AND  
BACKFLOW PROTECTION ORDINANCE**

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On October 31, 1967, The Sunnyvale City Council adopted Ordinance No. 1402, which added Chapter 12.28, “Cross-Connection and Backflow Protection,” to the Sunnyvale Municipal Code. The purpose of the ordinance was a further implementation of the California Administrative Code (Title 17, Sections 7583-7605 inclusive). These laws were adopted for the purpose of protecting the public water supply and/or the drinking water supply within the premises where plumbing defects or cross-connections may endanger it, due to some undiscovered or unauthorized cross-connection.

## **Chapter 12.28. CROSS-CONNECTIONS AND BACKFLOW PROTECTION**

### **12.28.010. Definitions—Generally.**

For the purpose of this chapter, unless it is plainly evident from the context that a different meaning is intended, certain terms used herein are defined in Sections 12.28.020 to 12.28.180. (Ord. 1402 § 1, 1967; prior code § 11-1.101).

### **12.28.020. Air gap separation defined.**

“Air gap separation” means a physical break between a supply pipe and a receiving vessel. The air gap shall be at least double the diameter of the supply pipe, measured vertically above the top rim of the vessel, and in no case less than one inch. (Ord. 1402 § 1, 1967; prior code § 11-1.101(a)).

### **12.28.030. Approved check valve defined.**

“Approved check valve” means a check valve that seats readily and completely. It must be carefully machined to have free-moving parts and assured watertightness. The face of the closure element and valve seat must be bronze, composition, or other noncorrodible material which will seat tightly under all prevailing conditions of field use. Pins and bushings shall be of bronze or other noncorrodible, nonsticking material, machined for easy, dependable operation. The closure element (e.g., clapper) shall be internally weighted or otherwise internally equipped to promote rapid and positive closure in all sizes where this feature is obtainable. (Ord. 1402 § 1, 1967; prior code § 11-1.101(b)).

### **12.28.040. Approved backflow prevention assembly defined.**

“Approved backflow prevention assembly” means an assembly which has passed laboratory and field evaluation tests performed by a recognized testing organization which has demonstrated its competency to perform such tests to the State Water Resources Control Board. (Ord. 3062-15 § 24; Ord. 1402 § 1, 1967; prior code 11-1.101(c)).

**12.28.050. Approved reduced pressure principal backflow prevention device defined.**

“Approved reduced pressure principle backflow prevention device” means a device incorporating two or more check valves and an automatically operating differential relief valve located between the two checks, two shutoff valves, and equipped with necessary appurtenances for testing. The device shall operate to maintain the pressure in the zone between the two check valves, less than the pressure on the public water supply side of the device. At cessation of normal flow the pressure between the check valves shall be less than the supply pressure. In case of leakage of either check valve, the differential relief valve shall operate to maintain this reduced pressure by discharging to the atmosphere. When the inlet pressure is two pounds per square inch or less, the relief valve shall open to the atmosphere thereby providing an air gap in the device. To be approved these devices must be readily accessible for maintenance and testing and installed in a location where no part of the device will be submerged. Unless otherwise authorized by the director, a pressure relief valve, rated at no more than fifty psi. greater than the water service pressure, shall be installed on the downstream side of the reduced pressure principle backflow prevention device. (Ord. 1402 § 1, 1967; prior code § 11-1.101(d)).

**12.28.060. Approved water supply defined.**

“Approved water supply” means any water supply approved by, or under the public health supervision of, a public health agency of the state of California, the county of Santa Clara, or the city of Sunnyvale. In determining what constitutes an approved water supply, the State Water Resources Control Board shall have the final judgment as to its safety and potability. (Ord. 3062-15 § 25; Ord. 1402 § 1, 1967; prior code § 11-1.101(e)).

**12.28.070. Auxiliary water supply defined.**

“Auxiliary water supply” means any water supply on or available to the premises other than the city water supply. (Ord. 1402 § 1, 1967; prior code § 11-1.101(f)).

**12.28.080. City defined.**

“City” means the city of Sunnyvale. (Ord. 1402 § 1, 1967; prior code § 11-1.101(g)).

**12.28.090. City health officer defined.**

“City health officer” means the Santa Clara County health officer, his or her assistants, or authorized deputies acting as, or any other person appointed as, health officer of the city of Sunnyvale. (Ord. 1402 § 1, 1967; prior code § 11-1.101(h)).

**12.28.100. City water supply defined.**

“City water supply” means an approved water supply sold and delivered to consumers’ premises through the waterworks system of the city of Sunnyvale. (Ord. 1402 § 1, 1967; prior code § 11-1.101(i)).

**12.28.110. Consumer defined.**

“Consumer” means any person to whom water is sold or furnished from the city water supply by the city of Sunnyvale. (Ord. 3062-15 § 26; Ord. 1402 § 1, 1967; prior code § 11-1.101(j)).

**12.28.115. Owner defined.**

“Owner” means the person, firm or corporation in which title in the underlying land is vested, or a duly authorized agent of such owner. (Ord. 3062-15 § 27). -1.104(e)).

**12.28.120. Contamination defined.**

“Contamination” means an impairment of the quality of the city water supply by the presence of any foreign substance (organic, inorganic, radiological or biological) to a degree which creates a hazard to the public health through poisoning or through the spread of disease. (Ord. 1402 § 1, 1967; prior code § 11-1.101(k)).

**12.28.130. Cross-connection defined.**

“Cross-connection” means any unprotected connection between any part of the city waterworks system used or intended to supply water for drinking purposes and any source or system containing water or substance that is not or cannot be approved as safe, wholesome, and potable for human consumption. (Ord. 1402 § 1, 1967; prior code § 11-1.101(l)).

**12.28.140. Director defined.**

“Director” means the director of environmental services of the city of Sunnyvale, or his or her authorized representatives. (Ord. 3062-15 § 28; Ord. 1402 § 1, 1967; prior code § 11-1.101(m)).

**12.28.150. Person defined.**

“Person” means any natural person, firm, association, organization, partnership, trust or association of persons, joint venture, corporation, or company, and includes the United States, the state of California, the county of Santa Clara, any special purpose district, and any officer or agent thereof. (Ord. 1402 § 1, 1967; prior code § 11-1.101(n)).

**12.28.160. Premises defined.**

“Premises” means integrated land area including improvements thereon undivided by public thoroughfares or water distribution mains of the city of Sunnyvale and where all parts of the premises are operated under the same management and for the same purpose. (Ord. 1402 § 1, 1967; prior code § 11-1.101(o)).

**12.28.170. Protective device defined.**

“Protective device” means any of the following devices:

- (a) Air gap separation;
- (b) Approved reduced pressure principle backflow prevention device. (Ord. 3062-15 § 29; Ord. 1402 § 1, 1967; prior code § 11-1.101(p)).

**12.28.175. Reduced-pressure principle detector assembly (RPDA).**

An assembly composed of a line-size, approved reduced-pressure principle backflow prevention assembly with a bypass containing a city specific water meter and an approved reduced-pressure principle backflow prevention assembly. The city meter shall register accurately for only very low flow rates, up to three gallons per minute, and shall show a registration for all rates of flow. (Ord. 3062-15 § 30).

**12.28.180. Service connection defined.**

“Service connection” means the terminal end of a service connection from the city water supply at its point of delivery to the consumer or owner. If a meter is installed “service connection” means the downstream end of the meter. No unprotected takeoffs from the service line ahead of any meter or approved backflow protective device located at the point of delivery to the consumer or owner shall be permitted. (Ord. 3062-15 § 31; Ord. 1402 § 1, 1967; prior code § 11-1.101(q)).

**12.28.185. Types of protection required.**

The type of assembly required to prevent backflow into the city’s water system shall be of this type: Reduced Principle Backflow Prevention Assembly (RP), Reduced Principle Detector Backflow Prevention Assembly (RPDA), and Air-Gap Separation Installations (AG). (Ord. 3062-15 § 32).

**12.28.190. Where protection required—Auxiliary water supply and multiple service connections.**

Each service connection from the city water supply for furnishing water to premises having an auxiliary water supply shall be protected against backflow of water from the premises into the city water supply, unless the auxiliary water supply is an approved

water supply or is accepted as an additional source by the director and is approved by the State Water Resources Control Board.

If the auxiliary water supply is not an approved water supply, or if it is not accepted as an additional source and approved in the manner specified above, and the auxiliary water supply is handled in a separate piping system with no known cross-connection, the city water supply shall be protected by an approved reduced pressure principle backflow prevention assembly installed at the service connection to the premises. When the auxiliary water supply may be contaminated, the director may order the city water supply protected by an air gap separation or an approved reduced pressure principle backflow prevention device installed at the service connection.

Premises where the water system has more than one service connection.

When the auxiliary water supply may be contaminated, the director may order the city water supply protected by an air gap separation installed at the service connection. (Ord. 3062-15 § 33; Ord. 1402 § 1, 1967; prior code § 11-1.102(a)).

**12.28.195. Where protection required—Existing water services without backflow protection.**

The city will inspect the premises of existing service connections which in the opinion of the director may require backflow prevention. If it is determined by the director that a backflow prevention device is required, the installation of a backflow prevention device shall be a condition of continued water service. (Ord. 3062-15 § 34).

**12.28.196. Where protection required—Upgrading of existing backflow protection devices.**

An existing backflow prevention device which, in the opinion of the director, is a type that does not provide adequate protection for the degree of potential hazard from backflow shall be upgraded. Upgrading may include complete replacement and relocation of the backflow prevention device, installation of additional devices, and/or correction of any on-site cross-connection hazards. (Ord. 3062-15 § 35)

**12.28.197. Responsibility.**

The city of Sunnyvale shall be responsible for implementing and enforcing the Cross-Connection Control Program Policies and Regulations. If, in the judgment of the director or authorized representatives an approved Backflow Prevention Assembly is required (at the customer's or owner's water service connection or within the private water system) the city of Sunnyvale shall give notice in writing to said customer or owner. The appropriate Backflow Prevention Assembly shall be immediately installed by and at the expense of the customer or owner at each connection where required to prevent backflow from the customer's or owner's premises to the public potable water system. It shall be the customer's or owner's responsibility to comply with the city of Sunnyvale's

requirements and failure to do so shall constitute grounds for the termination of water service until such requirements have been met. (Ord. 3062-15 § 36).

**12.28.200. Where protection required—Toxic or hazardous substances under pressure.**

At the service connection to any premises on which any material dangerous to health or toxic substance in toxic concentration is or may be handled under pressure, the city water supply shall be protected by an air gap separation. The air gap shall be located as close as practicable to the service cock and all piping between the service cock and receiving tank shall be entirely visible. If these conditions cannot reasonably be met, the city water supply shall be protected with an approved reduced pressure principle backflow prevention device which is acceptable to both the director and the city health officer. (Ord. 1402 § 1, 1967; prior code § 11-1.102(b)).

**12.28.210. Where protection required—Toxic or hazardous substances not under pressure.**

At the service connection to any premises on which any material dangerous to health or toxic substance in toxic concentration is not handled under pressure but is otherwise handled in such a manner as to constitute a cross-connection, the city water supply shall be protected by an approved reduced pressure principle backflow prevention device, unless such cross-connection is abated to the satisfaction of the director and approved by the city health officer. (Ord. 3062-15 § 37; Ord. 1402§ 1, 1967; prior code§ 11-1.102(c)).

**12.28.220. Where protection required—Nonhazardous substances.**

At the service connection to any premises on which a substance that would be objectionable (but not necessarily hazardous to health) if introduced into the city water supply is handled in such a manner as to constitute a cross-connection, the city water supply shall be protected by a reduced pressure principle prevention assembly unless such cross-connection is abated to the satisfaction of the director and approved by the city health officer. (Ord. 3062-15 § 38; Ord. 1402 § 1, 1967; prior code § 11-1.102(d)).

**12.28.230. Where protection required—Sewage treatment plants and pumping stations.**

At the service connection to any sewage treatment plant or sewage pumping station, the city water supply shall be protected by an air gap separation. The air gap shall be located as close as practicable to the service cock and all piping between the service cock and receiving tank shall be entirely visible. If these conditions cannot be reasonably met, the city water supply shall be protected with an approved reduced pressure principle backflow prevention device, providing this alternative is acceptable to both the director and the city health officer. A final decision in this matter shall be made by the State

Water Resources Control Board. (Ord. 3062-15 § 39; Ord. 1402 § 1, 1967; prior code § 11-1.102(e)).

**12.28.240. Where protection required—Substances flowing from premises to city water supply.**

Each service connection from the city water supply for furnishing water to premises on which any substance is or may be handled in such a manner as to permit entry into the city water supply shall be protected against backflow of the substance from the premises into the city water supply. This shall include the handling of process waters and waters originating from the city water supply which have been subject to change in quality. (Ord. 1402 § 1, 1967; prior code § 11-1.102(f)).

**12.28.250. Where protection required—Premises having internal cross-connections.**

Backflow protective devices shall be installed on the service connection to any premises that have internal cross-connections unless such cross-connections are abated to the satisfaction of the director and approved by the city health officer. (Ord. 1402 § 1, 1967; prior code § 11-1.102(g)).

**12.28.260. Where protection required—Consumer or owner responsibility.**

It shall be the responsibility of each consumer or owner at his or her own expense to furnish, install, and keep in good working order and safe condition any and all protective devices required in this chapter. The city shall not be responsible for any loss or damage directly or indirectly resulting from or caused by the improper or negligent installation, operation, use, repair or maintenance of, or interfering with, any protective device by any consumer or any other person. (Ord. 3062-15 § 40; Ord. 1402 § 1, 1967; prior code § 11-1.102(h)).

**12.28.270. Where protection required—Conflicts.**

Whenever two or more conditions exist on any premises for the correction of which different protective devices are required in this chapter, the consumer or owner shall be required only to install the protective device which, in the opinion of the director and city health officer, affords the maximum protection to the city water supply. (Ord. 3062-15 § 41; Ord. 1402 § 1, 1967; prior code § 11-1.102(i)).

**12.28.280. Inspections—Required—Repair or replacement—Records—Cost.**

The consumer or owner on whose premises any protective device is installed shall have each such device inspected annually. If successive inspections disclose repeated failures in the operation of any device, the director may require more frequent inspections. Each device shall be repaired, overhauled or replaced at the expense of the consumer or owner whenever it is found to be defective. Records of such tests, repairs, and overhauls shall be kept and made available to the director. The director shall have the

duty of determining that the inspections required herein are performed properly. If following demand therefor the consumer or owner fails to have any of the inspections made as required herein or to make the above-described records available, the director shall have the right to inspect the device and the consumer or owner shall pay the cost thereof. The cost of any inspection made by the director may be included as a part of the next ensuing municipal water bill presented to the consumer. (Ord. 3062-15 § 42; Ord. 1402 § 1, 1967; prior code § 11-1.103).

**12.28.290. Noncompliance—Protection required for service connection.**

No water service connection shall be installed on the premises of any consumer or owner unless the city water supply is protected as required by this chapter.

Approval must be obtained from the city before a backflow prevention assembly can be installed, removed, relocated or replaced, and an Inspection Permit must be obtained from the city before any work can be started.

It is prohibited to install, remove, relocate, replace, or tamper with a backflow prevention assembly or if the director finds evidence that an installed backflow prevention assembly has been by-passed, modified, made, or allowed to remain ineffective.

It is prohibited for any consumer or owner, company, corporation or association, who fails to install, or permit to be installed, backflow prevention assemblies as required by this chapter, the Cross-Connection Control Program Policies and Regulations, or who by-passes, alters or refuses to maintain a backflow prevention assembly.

Failure to adhere to any portion of this section, if said person is a consumer of city water, the bill for such costs may be added to his or her bill for water service and collected under the same rules and regulations. (Ord. 3062-15 § 43; Ord. 1402 § 1, 1967; prior code § 11-1.104(a)).

**12.28.300. Noncompliance—Discontinuance of service.**

Delivery of water to the premises of any consumer or owner may be discontinued by the director if any protective device required by this chapter has not been installed, inspected, tested and maintained, or is defective, or has been removed or bypassed. (Ord. 3062-15 § 44; Ord. 1402 § 1, 1967; prior code § 11-1.104(b)).

**12.28.310. Noncompliance—Discontinuance without notice when.**

Delivery of water shall be discontinued immediately and without notice to the consumer or the owner if the director or city health officer determines that:

- (a) The city water supply is being contaminated or is in immediate danger of contamination;

(b) A protective device required by this chapter has not been installed, or is defective, or has been removed or bypassed; and

(c) The consumer or owner cannot immediately be located. Delivery of water shall not be resumed until any protective device required by this chapter and approved by the director has been properly installed, or until conditions at the consumer's or owner's premises causing the contamination or danger of contamination have been abated or corrected to the satisfaction of the director and the city health officer. (Ord. 3062-15 § 45; Ord. 1402 § 1, 1967; prior code § 11-1.104(c)).

**12.28.320. Noncompliance—Discontinuance—Notice.**

(a) Except as provided in Section 12.28.310, delivery of water shall not be discontinued until written notice thereof has been given to the consumer owner.

(b) The notice shall state:

1. The conditions or defects which must be corrected;
2. The manner in which the stated conditions or defects are to be corrected; and
3. The date on or after which delivery of water will be discontinued, and which shall not be less than fifteen nor more than ninety days following the date of delivery or mailing of the notice.

(c) The city may grant the consumer or owner an extension of an additional period not to exceed ninety days if it determines the consumer or owner has exercised due diligence but has been unable to comply with the notice within the time originally allowed.

(d) The notice shall be given by delivering the same to the consumer, owner, manager or agent thereof, or to any person in charge of, or employed in the place of business of the consumer or owner; or, if the consumer has no place of business, then at the place of residence of the consumer or owner if known, or by leaving the notice at either the place of business or the residence of the consumer or owner. If the consumer or owner cannot be found and service of the notice cannot be made in the manner provided herein, then a copy of the notice shall be mailed, postage fully prepaid, addressed to the consumer or owner at the place of business or residence set forth in the application of consumer for water service in the records of the city.

- (e) Once discontinued, delivery of water shall not be resumed until any protective device required by this chapter and approved by the director has been properly installed, or until the conditions at the consumer's or owner's premises creating the need for a protective device have been abated or corrected to the satisfaction of the director and the city health officer. (Ord. 3062-15 § 46; Ord. 1402 § 1, 1967; prior code § 11-1.104(d)).

**12.28.330. Noncompliance—Right of entry for inspections.**

For the purpose of making any inspections or discharging the duties imposed by this chapter, the director and city health officer shall have the right to enter upon the premises of any consumer or owner. Each consumer or owner as a condition of the continued delivery to his or her premises of water from the city water supply shall be considered as having stated his or her consent to the entry upon his or her premises of the director and city health officer for the purposes stated herein. (Ord. 3062-15 § 47; Ord. 1402 § 1, 1967; prior code § 11-1.104(e)).

**12.28.340. City requirements for approved backflow prevention assembly testers and installers.**

In order to ensure that the testing and installation of backflow prevention devices are performed by technically competent individuals who are personally responsible and, are employed by persons and/or organizations which are also responsible, the city is authorized to establish and implement procedures set forth in the Cross-Connection Control Program Policies and Regulations consistent with this chapter for the approval by city of backflow prevention testers and installers.

- (a) No person shall perform tests or install backflow prevention devices in the city unless he or she has been approved to do so by the city. No person, firm, corporation or other form of business organization shall permit an employee to perform tests or installations of backflow prevention devices in the city unless such employee has been approved to do so by the city.
- (b) The approval procedures shall require each prospective tester and installer to submit an application to the city providing such information as the city may determine to be reasonably necessary to establish the applicant's technical competence and personal responsibility.
- (c) The city shall review each application and may make such other investigation of the applicant, and the applicant's employer, as the city considers appropriate to determine the responsibility of the applicant and the applicant's employer, including but not limited to, verifying information submitted by the applicant.

- (d) The city shall compile, and update no less frequently than annually, a list of the names, business addresses and telephone numbers of all approved testers and installers and shall make the current version of such list available to city customers.
- (e) The city may require an approved tester to (1) demonstrate backflow prevention device testing procedures in the field, and (2) provide advance notice to the city of scheduled backflow prevention device testing, installation or repair work so that it may be observed by the city.
- (f) The city may use backflow prevention assembly testers and installers who have been approved by the American Water Works Association (AWWA) and that have: (1) either a C36, A or B Contractors License, issued by the state of California Contractors License Board, (2) evidence that they are bonded for a minimum of \$1,000,000.00, (3) the ability to legally perform all required work within the City limits and (4) submitted a statement to the Director swearing under oath that all work performed within the city shall be undertaken consistent with the “Cross-Connection Control Program Policies and Regulations.”
- (g) Each backflow prevention assembly tester and installer may be permitted for a period not to exceed one year. However, permits may be revoked, suspended, or not renewed by the city, at the Director’s discretion, for improper testing, repairs, or reporting; failure to maintain an AWWA backflow certificate or their state of California contractor’s license, failure to maintain the appropriate level of bonding; violation of the Cross-Connection Control Program Policies and Regulations, or installs, repairs or tests the devices in a negligent manner or any other reason deemed appropriate by the director. (Ord. 3062-15 § 48).

The following is a list of plants or facilities where backflow protection is required, but not limited to:

Aircraft and Missile Plants  
Automotive Plants  
Auxiliary Water Systems  
Beverage Bottling Plants  
Breweries  
Buildings – Hotels, Apartment Houses with Five or More Units, Public and Private Buildings, or any other structures having unprotected actual or potential cross-connections.  
Canneries, Packing Houses and Reduction Plants  
Chemical Plants – Manufacturing, Processing, Compounding or Treatment  
Chemically Contaminated Water Systems  
Civil Works  
Dairies and Cold Storage Plants  
Film Laboratories  
Fire Systems with Pumps  
Hospitals, Medical Buildings, Sanitariums, Morgues, Mortuaries, Autopsy Facilities, Nursing and Convalescent Homes and Clinics.  
Irrigation Systems-Premises having separate systems such as Parks, Playgrounds, Cemeteries, Golf Courses, Schools, Estates, Ranches, etc.  
Laundries, Dye Works and Cleaners  
Metal Manufacturing, Cleaning, Processing & Fabrication Plants  
Motion Picture studios  
Oil and Gas Production-Storage or transmission properties  
Paper and Paper Products Plants  
Plating Plants  
Power Plants  
Radioactive Materials or Substance – Plants or Facilities Handling Restricted, Classified or Other Closed Facilities  
Rubber Plants – Natural or Synthetic  
Sand and Gravel Plants  
School and Colleges  
Sewage and Storm Drain Facilities  
Water Front Facilities and Industries  
Food Establishments  
Animal Grooming Shops  
Barber, Beauty and Hair Styling Shops  
Meat & Produce Markets  
Nurseries (Plants)  
Cocktail Lounges  
Automotive Repair Shops  
Multi Use Commercial Buildings  
Facilities Using Recycled or Treated Water

Copies of the applicable portions of the State of California Administrative Code and of Section 12.28 of the Sunnyvale Municipal Code are reprinted herein for reference purposes.

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# **Standard Operating Procedures for the Cross-Connection Control Program**

456 West Olive Ave.  
Sunnyvale, CA 94086  
Telephone (408) 737-4960

## **Standard Operating Procedures for the Cross-Connection Control Program**

### **Instructions for Certified Backflow Prevention Assembly Testers**

#### **Purpose**

The purpose of these instructions is to set forth the responsibilities of and requirements for backflow prevention assembly testers in the City of Sunnyvale. The instructions describe the requirements for operating in Sunnyvale, what forms to use, and how to communicate with the various City departments involved in the Cross-Connection Control Program. Information provided by testers and installers is used to maintain the Cross-Connection Control Program database and assists the City in creating new accounts and updating existing accounts. It is important that testers ensure the accuracy of reports and information submitted to the program.

These instructions are organized into the following sections:

1. Backflow Prevention Tester, Installer and Repairer Requirements
2. Backflow Field Inspection Permits
3. Certified Tester and Installer Responsibilities and Device Standards
4. Obtaining Backflow Tags and Tag Requirements
5. Obtaining Backflow Assembly Test Report Forms
6. Recording or Correcting Information on Backflow Assembly Test Report Forms
7. Submitting Test Reports
8. Reporting Problems Observed in the Field
9. Other Information

#### **1. Backflow Prevention Tester, Installer and Repairer Requirements**

- The City of Sunnyvale maintains an annual list of Approved Backflow Testers, Installers and Repairers. To be placed on the list, Testers, installers and repairers must submit an application, provide documentation, pay an annual fee and be issued a permit. **Test results will not be accepted from anyone not on this list.**
- The application packet can be found on the City's website at [Sunnyvale.ca.gov](http://Sunnyvale.ca.gov). Search for "Cross-Connection Control". The application may also be obtained in person or by contacting:

#### **City of Sunnyvale**

#### **Department of Finance**

ATTN: Cross-Connection Control Program

650 W. Olive Avenue

Sunnyvale, CA 94086-7637

(408) 737-4960 Office

[backflow@sunnyvale.ca.gov](mailto:backflow@sunnyvale.ca.gov)

## **Requirements:**

1. Testers/companies must be certified and be current as American Water Works Association Backflow Prevention Assembly General Testers.
2. Testers/companies must have a current State of California Contractor's License C-36, A, or B.
3. Testers/companies must have a current City of Sunnyvale Business License.
4. Testers/companies must maintain general liability insurance in full force and effect, for all activities performed under the permit. Such insurance must include coverage for bodily injury, personal injury, including death resulting therefrom, and property damage insurance, with limits not less than \$1 million each occurrence combined single limit. A cross-liability clause must be attached. The insurance must provide 30-day prior written notice of cancellation, non-renewal, or material change to the Sunnyvale Department of Finance.
5. Testers/companies must obtain an annual Backflow Testing Permit from the City of Sunnyvale and pay the associated fee.
6. Testers/companies must provide the test kit serial number and date of calibration for each tester. Any new kits put into service mid permit cycle will require a calibration certificate to be submitted.
7. Testers/companies wishing to test backflow prevention devices supplied by recycled water must provide test kit serial number and date of calibration for a test kit(s) dedicated to such use.
8. Testers/companies must not have been removed from another Agency's list, reprimanded by or subject of an investigation by an agency, or water utility related to backflow prevention device testing, installation, and repair or reporting.
9. Testers/companies must not have engaged in dishonest or illegal business practices or installed, repaired or tested devices in a negligent manner within the City of Sunnyvale.
10. Testers/companies must not have performed backflow prevention installation, removal, replacement, or relocation within City limits without first obtaining a Backflow Inspection Permit and without City approval.
11. Testers/companies must not perform backflow device testing without documenting the test and attaching a City of Sunnyvale Backflow tag for each successful test.
12. Testers/companies must not have any unresolved customer complaints reported to the City, the Better Business Bureau, or the State Contractor's License Board.
13. The City may suspend or revoke approval of an individual tester and or company from the list of approved testers without notice if the individual or company fails or refuses to comply with the City's Cross-Connection Control Program Policies and Regulations, engages in dishonest business practices in the City of Sunnyvale, or fails to maintain a valid "Backflow

Prevention Assembly Tester Certificate" from the American Water Works Association, Sunnyvale business license, general liability insurance, Contractor's License C-36, A or B, test kit calibration; or installs, repairs or tests the devices in a negligent manner. Failure to abide by any of these requirements may be grounds for exclusion from the approved testers list for a period of up to (2) two years.

## 2. **Backflow Field Inspection Permits**

- A Backflow Field Inspection Permit shall be obtained in person in order to proceed with the **installation, removal, replacement, or relocation (raising)** of a backflow prevention assembly.
- Permits are non-refundable and non-transferrable and can be obtained at:

### **City of Sunnyvale**

#### **Department of Finance**

ATTN: Cross-Connection Control Program

650 W. Olive Avenue

Sunnyvale, CA 94086-7637

(408) 737-4960 Office

backflow@sunnyvale.ca.gov

- The failure to obtain a Backflow Field Inspection Permit may result in an administrative citation.
- For an installation to be considered complete, the installation must be inspected and signed off by a Sunnyvale Cross-Connection program representative. To schedule a backflow field inspection, call (669) 600-7322, Monday through Friday between the hours of 7:00 a.m. to 3:00 p.m. or email [crossconnection@sunnyvale.ca.gov](mailto:crossconnection@sunnyvale.ca.gov).
- All new backflow installations, defined as a backflow device that is being newly installed where no backflow device was previously installed, must follow the applicable Sunnyvale standard detail to be signed off. New installations that do not follow the standard detail could result in administrative citation, or removal of the installer from the Sunnyvale approved installer list.

### **(a) New Installations**

- New installations must be reported on "New Assembly Installation Report" forms, which can be obtained from either the Cross-Connection Control Program website at [Sunnyvale.ca.gov](http://Sunnyvale.ca.gov) (search for "Cross-Connection", or by emailing [backflow@sunnyvale.ca.gov](mailto:backflow@sunnyvale.ca.gov) or calling 408-737-4960.
- Note that this form should only be used in two cases:
  - If a backflow prevention assembly has never existed at the service address.
  - If a backflow prevention assembly exists at a site but has not been entered into the Cross-Connection Control Program's database, for example, it does not have a Sunnyvale tag. (If an assembly does not have a tag, inform the customer and the Cross-Connection Control Program immediately.)

- Enter the utility account number, if known, on the New Assembly Installation Report. This information is important for associating the correct customer with a backflow prevention assembly.
- Under "Backflow Assembly Location," try to be as specific as possible. Example 1: Building B, 2nd Floor, north wall utility closet labeled J2. Example 2: Basement, 25 feet east of the northeast corner, below stairwell.

**(b) Removal, Replacement or Relocation (Raising) of Backflow Prevention Assemblies**

Report the removal or replacement of a backflow prevention assembly on a Backflow Prevention Assembly Test Report. If the assembly being removed or replaced was tested, be sure to record the results of the test in the "Initial Test" area of the form. If a new assembly is installed, record its information in the areas provided. Then record the test results for the new assembly in the "Final Test" area of the form. It is important that the information for both the old and new assemblies be reported on the same form. That way, the customer will have the correct serial number and associated backflow prevention assembly inactivated; the serial number and associated information for the new assembly will be entered in to the Cross-Connection Control Program's database; and the old and new assemblies will be tied together in the database history.

**3. Certified Tester and Installer Responsibilities and Device Standards**

- If a tester/installer finds an assembly that has been modified or incorrectly installed, the tester/installer must immediately report the situation to the Cross-Connection Control Program and not test the assembly. To report the situation, describe it in the "Comments" section of the Backflow Assembly Test Report Form and submit the form. (See Section 7 for how to submit test report forms).
- All assemblies installed in Sunnyvale must be on the "Approved Backflow Prevention Assemblies" list developed by the University of Southern California (USC) Foundation for Cross-Connection Control and Hydraulic Research. Any modification of an assembly—such as relocation of valves, bypass arrangements, and jumper connections, whether temporary or permanent—invalidates the foundation's approval and is not permitted. Likewise, an assembly that has been installed in an orientation for which it was not designed or approved is also not permitted. Exceptions are only accepted by written permission of the Cross-Connection Specialist.
- For **existing backflow devices** only, it is the tester/installer responsibility to ensure that the device meets the minimum Title 17, manufacturer, and City of Sunnyvale standards:

**Double Check Valve Assembly (DC).** An existing double check valve assembly shall be installed a minimum of twelve inches (12”) above grade, in its approved manufacturer specifications, and in a manner where it is readily accessible for testing and maintenance. A failed or auto-failed DC that is nonrepairable shall be replaced with a lead-free RP.

**Double Check Detector Assemblies (DCDA).** An existing DCDA shall be installed a minimum of twelve inches (12”) above grade, in its approved manufacturer specifications, and in a manner

where it is readily accessible for testing and maintenance. A failed or auto-failed DC that is nonrepairable shall be replaced with a lead-free RPDA.

**Reduced Pressure Detector Assembly (RPDA).** An existing RPDA shall be installed a minimum of twelve inches to a maximum of eighteen inches (12"-18") above grade for a horizontal device and thirty to thirty-six inches (30"-36") above grade for a vertical device, measured from the bottom of the device and with a minimum of twenty four inches (24") side clearance.

**Reduced Pressure Principle Backflow Prevention Device (RP).** An existing RP shall be installed a minimum of twelve inches to a maximum of eighteen inches (12"-18") above grade for a horizontal device and twenty four to thirty inches (24"-30") above grade for a vertical device, measured from the bottom of the device and with a minimum of twenty four inches (24") side clearance.

- Any device that fails to meet these minimum standards shall not be tested, it shall be auto-failed, and the condition reported to the Cross-Connection Control Program immediately.
- The provision of recycled water to a premise constitutes an auxiliary water supply not approved for potable use as described in Sunnyvale Municipal Code 12.28.190. In certain cases, the City may require RPs or other backflow prevention devices to be installed on the recycled water service. The City will evaluate the need for such protection on a case-by-case basis. Test equipment must be dedicated for use with recycled **water only, and must not be reused on potable water systems.**
- Tester/installer must submit test results by mail or electronically on forms obtained from the Cross-Connection Control Program. (See Section 5 for how to obtain forms).
- Tester/installer must maintain a continuous record of the dates and locations of each inspection performed, any tests made, and results for three years. The records must be made available at the request of the Sunnyvale Cross-Connection Control Program.
- Failure to adhere to any of these requirements may result in the revocation of a backflow tester's Backflow Testing Permit for a period of one year.
- Installing galvanized piping is strictly prohibited.

#### **4. Obtaining Backflow Tags and Tag Requirements**

- A backflow tag is required for each backflow device that is tested. Tester/installers must obtain backflow tags from the City of Sunnyvale, located at:

**City of Sunnyvale**  
**Department of Finance**  
ATTN: Cross-Connection Control Program  
650 W. Olive Avenue  
Sunnyvale, CA 94086-7637  
(408) 737-4960 Office  
(408) 328-0714 Fax  
backflow@sunnyvale.ca.gov

- Tags must be obtained in person. Tags are non-refundable but are transferrable.
  - Backflow tag requirements:
  - Backflow tags shall be installed in a manner that allows for ease of accessibility.
  - Backflow tags shall be installed after a passed test of the device is completed.
  - Backflow tags shall be completely filled out, the writing shall be legible, and the ink shall be weather resistant.
- Failure to adhere to these requirements will void the test.

## **5. Obtaining Backflow Assembly Test Report Forms**

- A City of Sunnyvale Backflow Assembly Test Report must be used to report test results for existing backflow prevention assemblies, (for new installations, see Section 6). This form must also be used if you remove or replace a backflow prevention assembly, rebuild or repair it, or do anything at a location where a backflow prevention assembly once existed.
- Backflow Assembly Test Report forms are sent to customers along with a minimum 30-day notice indicating that testing is due.
- The notices also include the customer's utility account number, which is associated with the assemblies at a given service address.
- Testers are strongly encouraged to use preprinted forms specific to each device provided by the City. If these forms are not available, testers and customers can request the forms by emailing [backflow@sunnyvale.ca.gov](mailto:backflow@sunnyvale.ca.gov) or calling 408-737-4960 and including the utility account number(s) and/or desired site locations.
- If a customer needs to obtain preprinted test forms at a time not associated with annual testing, for example, because a leaking assembly needs repair, the tester may call the Cross-Connection Control Program at (408) 737-4960.

## **6. Recording or Correcting Information on Backflow Assembly Test Report Forms**

- On pre-printed test forms, cross out the incorrect information.
- If you wish to add a contact to the account, such as a chief engineer or person to call, add it to the "Comments" field below the second section of the test report. All comments are forwarded to the Department of Finance. The information will be entered in to the Cross-Connection Control Program's database.
- If you believe that information on a pre-printed test form is incorrect, such as the location or make of a backflow prevention assembly, contact the Cross-Connection Control Program to report the error, or enter the correct information into the "Comments" field below the second section of the test report. All comments are forwarded to the Department of Finance for review. Staff will review the program's database and verify the information.
- If customer information (name or mailing address) needs to be updated, the customer must contact the Cross-Connection administrative number at (408) 737-4960 or [backflow@sunnyvale.ca.gov](mailto:backflow@sunnyvale.ca.gov) to have the changes made. Information will then be updated in the Cross-Connection Control Program's database.

- If a customer wishes to change the testing date to another month or synchronize multiple accounts, he or she can arrange this by contacting the administrative office of Cross-Connection Control Program at (408) 737-4960 or [backflow@sunnyvale.ca.gov](mailto:backflow@sunnyvale.ca.gov).

## **7. Submitting Test Reports**

- Test report forms must be the approved City of Sunnyvale Test forms or they will not be accepted.
- Test results shall be submitted as soon as possible after the test date. Failed test results should be reported in a timely fashion, as well, whether or not the reason for the failure has been addressed. Test results may be submitted electronically, by mail, or in hard-copy format. Testers/installers are responsible for submitting their own test reports.
- If results are in hard-copy format, submit only original, signed test reports by mail or high-resolution scan of the signed test reports by email.
- Hard-copy reports that have been electronically altered in any way are not acceptable.
- Test reports can be submitted by mail or email:

**City of Sunnyvale**  
**Department of Finance/Utility Billing Division**  
 ATTN: Cross-Connection Program  
 650 W. Olive Avenue  
 Sunnyvale, CA 94086-7637  
 (408) 737-4960 Office  
[backflow@sunnyvale.ca.gov](mailto:backflow@sunnyvale.ca.gov)

## **8. Reporting Problems Observed in the Field**

- If a backflow prevention assembly fails a test, the results of the test are to be recorded in the "Initial Test" results area of the test form. The tester should then contact the customer and request authorization to repair the assembly or recommend that it be replaced. If the repair or replacement has been immediately completed after the initial test date, then the tester must submit the test report showing the failed initial test to the Department of Finance.
- If a tester finds a cross-connection hazard that is unprotected, that is, with no backflow prevention assembly or the wrong type of assembly, the tester must inform the customer of the hazard and potential health risk associated with it. The tester must also report the situation to the Cross-Connection Control Program field staff immediately at (669) 600-7322 or to [crossconnection@sunnyvale.ca.gov](mailto:crossconnection@sunnyvale.ca.gov) (by telephone if the hazard has no protection at all). An assembly that is the wrong type for the hazard shall not be tested and shall be reported.
- If a tester finds a backflow assembly that has been modified or incorrectly installed (e.g., illegal by-pass, relocated shut-off valve, or wrong orientation), the assembly must be reported to the Cross-Connection Control Program immediately and shall not be tested.
- If a tester finds an existing backflow prevention assembly that is not tagged or is out of compliance with its test date, the tester must inform the customer of the need to test the

assembly and must report the assembly to the Cross-Connection Control Program immediately.

- Contact Information:

**City of Sunnyvale**

**Department of Finance**

ATTN: Cross-Connection Control Program

650 W. Olive Ave

Sunnyvale, CA 94086-7637

408-737-4960 Office

669-600-7322 Field Specialist

408-328-0714 Fax

Backflow@sunnyvale.ca.gov (administrative questions and test forms and results)

CrossConnection@Sunnyvale.ca.gov (technical and field-related questions)

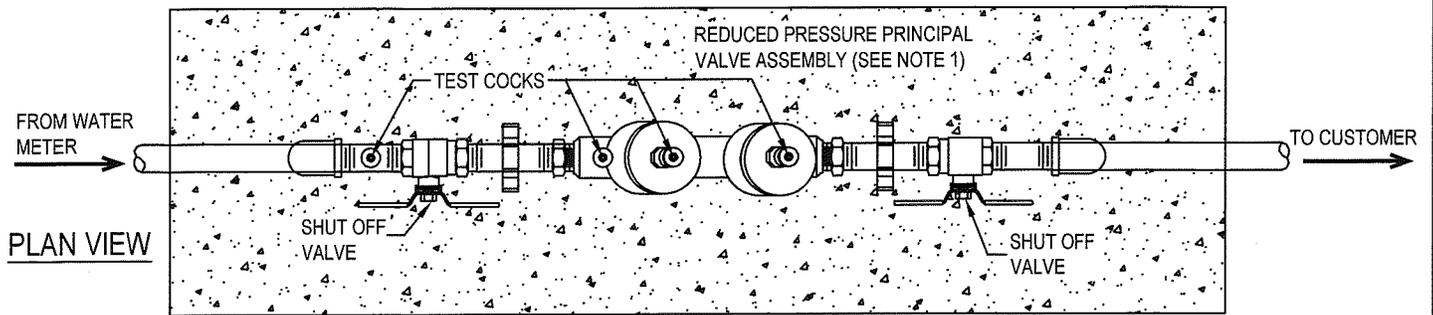
**9. Other Information**

- Contacting Cross-Connection Control Program field staff from the field can save you time and resources; often, questions can be answered or issues rectified on the spot. In addition, vital information that you might not otherwise know to record might be needed from the site.
- Testers and customers can call Cross-Connection Control Program staff at (408) 737-4960 to check on the compliance status of their accounts.

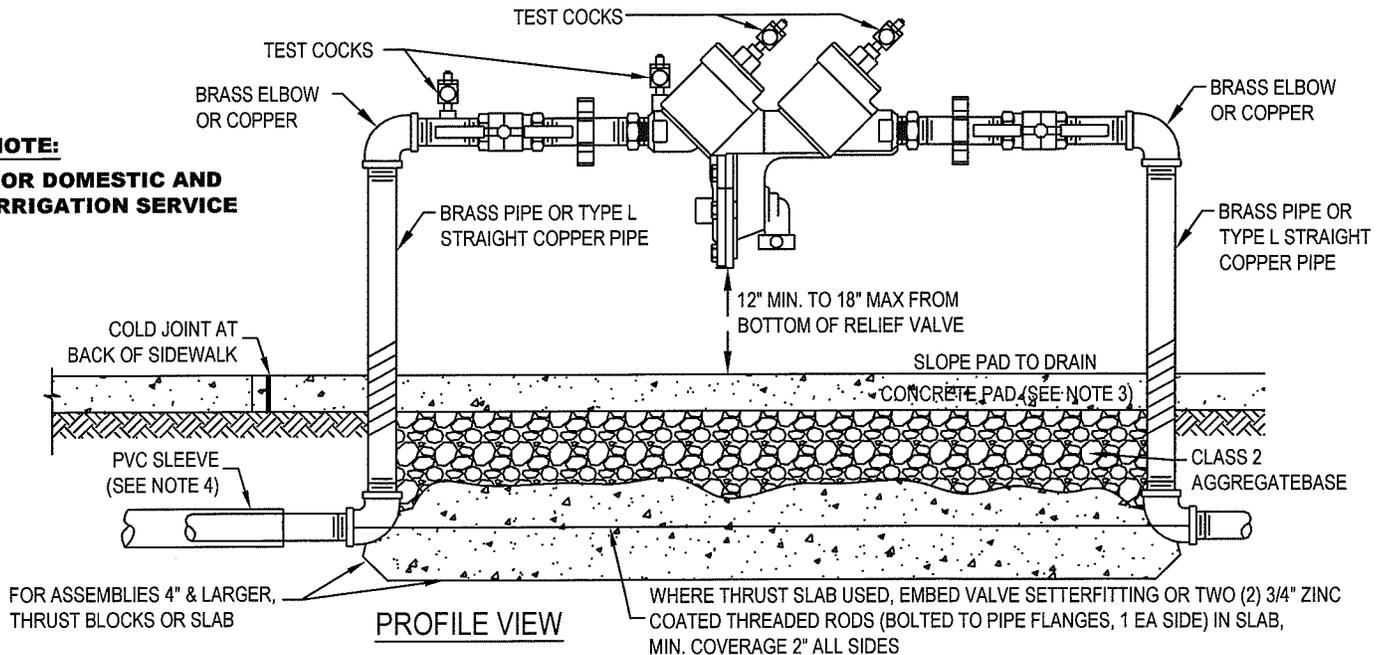
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# **Standard Detail Drawings**

456 West Olive Ave.  
Sunnyvale, CA 94086  
Telephone (408) 737-4960



**NOTE:  
FOR DOMESTIC AND  
IRRIGATION SERVICE**



**NOTES:**

1. ALLOWED BACKFLOW ASSEMBLIES AND THEIR ORIENTATIONS SHALL BE LIMITED TO THOSE SPECIFIED ON THE "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES" BY THE UNIVERSITY OF SOUTHERN CALIFORNIA'S FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH, 2010 OR LATEST REVISION.
2. THE BACKFLOW DEVICE SHALL BE LOCATED: ON PRIVATE PROPERTY AND A MAXIMUM OF 5' FROM BACK OF SIDEWALK(TYP); OR AT A LOCATION DETERMINED BY THE WATER DISTRIBUTION CROSS CONNECTION PERSONNEL IN THE FIELD.
3. CONCRETE PAD SHALL BE CLASS B CONCRETE, 4" MINIMUM THICKNESS, REINFORCED WITH WELDED WIRE MESH.
4. WHERE SERVICE LINES SMALLER THAN 4" PASS UNDER A SIDEWALK, THEY SHALL BE INSTALLED IN A PVC CASING/SLEEVE AT LEAST 1" LARGER THAN THE SERVICE LINE AND EXTENDS AT LEAST 6" BEYOND THE EDGES OF THE SIDEWALK.
5. METAL PIPES EXPOSED TO SOIL OR CONCRETE SHALL BE COATED WITH 3M SCOTCHWRAP PIPE PRIMER AND WRAPPED WITH 3M SCOTCHWRAP 20ML NO.51 BLACK PVC TAPE(1/2"OVERLAP).
6. THE PORTION OF THE TRENCH FROM BACK OF METER TO THE DEVICE SHALL REMAIN OPEN UNTIL WATER DISTRIBUTION CROSS CONNECTION PERSONNEL HAVE INSPECTED AND APPROVED THE INSTALLATION. CALL 669-600-7322.
7. THE TESTING SIDE OF THE DEVICE SHALL HAVE A MINIMUM 24" OF CLEARANCE FROM OBSTRUCTIONS(NON-TRIMMABLE LANDSCAPING, BUILDINGS, UTILITIES, ETC). MULTIPLE BACKFLOW DEVICES SHALL BE SEPARATED BY A MINIMUM OF 18" AND BE OF EQUAL HEIGHT.
8. BOLLARDS MAY BE REQUIRED BY CITY TO PROVIDE ADDITIONAL PROTECTION.
9. BACKFLOW ASSEMBLIES INSTALLED ON POTABLE WATER SERVICES SHALL BE LEAD FREE.
10. BACKFLOW ASSEMBLIES SHALL BE THE SAME SIZE OF THE WATER METER.
11. NO GALVANIZED PIPE OR DISSIMILAR METAL PIPE MAY BE INSTALLED.
12. A BACKFLOW PREVENTER ENCLOSURE IS OPTIONAL, IF INSTALLED FOLLOW DETAIL 19B.

**BACKFLOW PREVENTION DEVICE  
SIZE UP TO 2"**



Sunnyvale

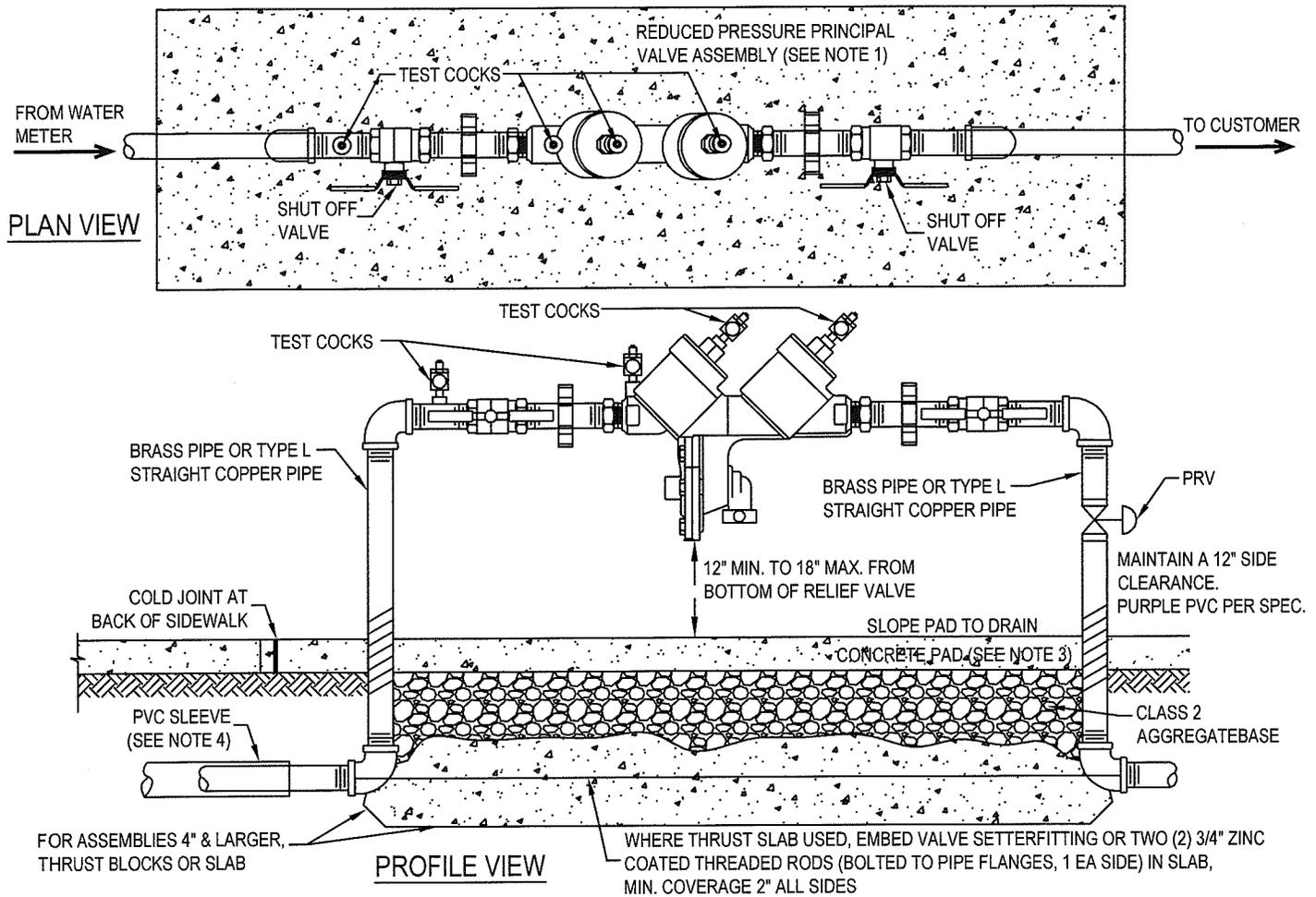
*[Signature]*

APPROVED BY:

DATE: JUNE 30, 2006  
REVISED: JULY 2019

DWG.

18B



**NOTES:**

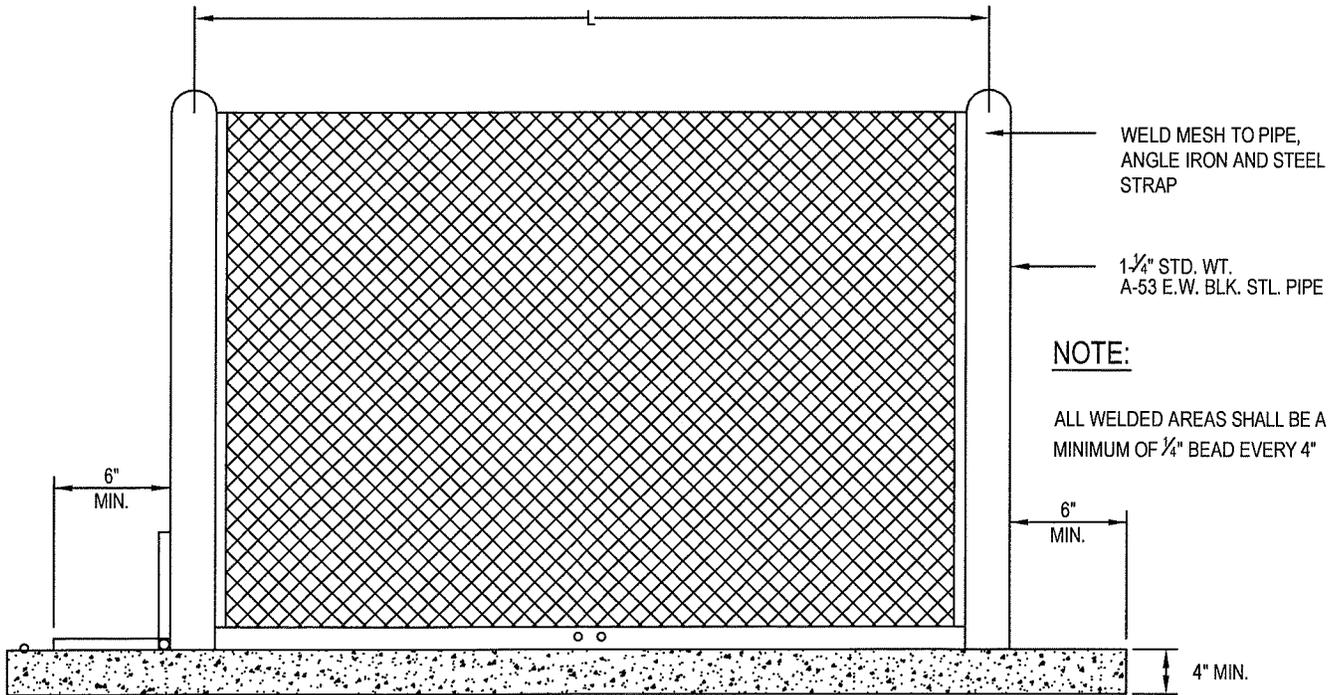
1. ALLOWED REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLIES AND THEIR ORIENTATIONS SHALL BE LIMITED TO THOSE SPECIFIED ON THE "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES" BY THE UNIVERSITY OF SOUTHERN CALIFORNIA'S FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH, 2010 OR LATEST REVISION.
2. THE BACKFLOW DEVICE SHALL BE LOCATED: ON PRIVATE PROPERTY AND A MAXIMUM OF 5' FROM BACK OF SIDEWALK(TYP); OR AT A LOCATION DETERMINED BY THE WATER DISTRIBUTION CROSS CONNECTION PERSONNEL IN THE FIELD.
3. CONCRETE PAD SHALL BE CLASS B CONCRETE, 4" MINIMUM THICKNESS, REINFORCED WITH WELDED WIRE MESH.
4. WHERE SERVICE LINES SMALLER THAN 4" PASS UNDER A SIDEWALK, THEY SHALL BE INSTALLED IN A PVC CASING/SLEEVE AT LEAST 1" LARGER THAN THE SERVICE LINE AND EXTENDS AT LEAST 6" BEYOND THE EDGES OF THE SIDEWALK.
5. METAL PIPES EXPOSED TO SOIL OR CONCRETE SHALL BE COATED WITH 3M SCOTCHWRAP PIPE PRIMER AND WRAPPED WITH 3M SCOTCHWRAP 20 MIL NO.51 BLACK PVC TAPE(1/2" OVERLAP).
6. THE PORTION OF THE TRENCH FROM BACK OF METER TO THE DEVICE SHALL REMAIN OPEN UNTIL WATER DISTRIBUTION CROSS CONNECTION PERSONNEL HAVE INSPECTED AND APPROVED THE INSTALLATION. CALL 669-600-7322.
7. THE TESTING SIDE OF THE DEVICE SHALL HAVE A MINIMUM 24" OF CLEARANCE FROM OBSTRUCTIONS(NON-TRIMMABLE LANDSCAPING, BUILDINGS, UTILITIES, ETC). MULTIPLE BACKFLOW DEVICES SHALL BE SEPARATED BY A MINIMUM OF 18" AND BE OF EQUAL HEIGHT.
8. BOLLARDS MAY BE REQUIRED BY CITY TO PROVIDE ADDITIONAL PROTECTION.
9. PRV TO BE MAINTAINED BY PROPERTY OWNER.
10. NO GALVANIZED PIPE OR DISSIMILAR METAL PIPE MAY BE INSTALLED.
11. A BACKFLOW PREVENTER ENCLOSURE IS OPTION, IF INSTALLED FOLLOW DETAIL 19B.
12. BACKFLOW PREVENTER TO BE PAINTED WITH PURPLE COLOR, NO BRASS TO BE PAINTED.

**RECYCLED WATER  
BACKFLOW PREVENTION DEVICE  
SIZE UP TO 2 INCHES**



DATE : JUNE 30, 2006  
REVISED: JULY 2019

APPROVED BY: *[Signature]*  
DWG. **18B-1**



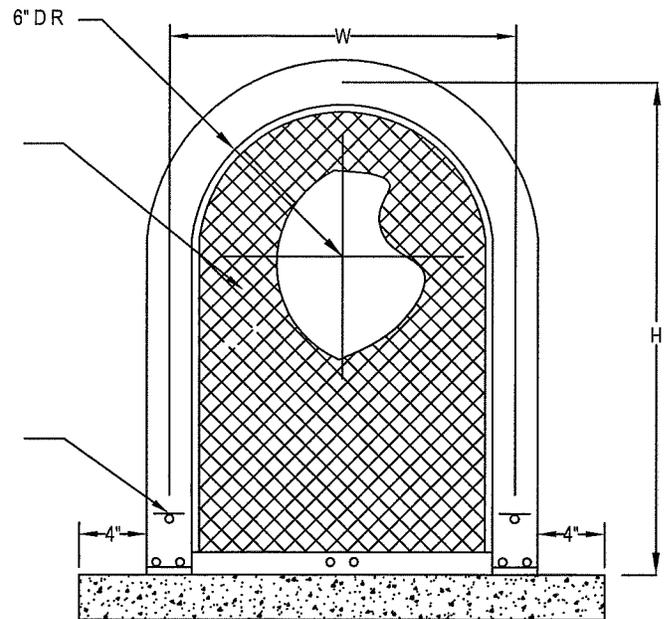
**NOTE:**

ALL WELDED AREAS SHALL BE A MINIMUM OF 1/4" BEAD EVERY 4"

1/2" NO. 13 FLATTENED DIAMOND PATTERN STEEL MESH

MODEL	CENTERLINE DIM.
GS - 1	12"W x 24"H x 24"L
GS - 2	12"W x 24"H x 32"L
GS - 3	12"W x 18"H x 42"L

WELD 4" STL. HINGES (2) ON GS-3



**NOTES:**

1. ENCLOSURE IS RECOMMEND TO REDUCE RISK OF THEFT OR TAMPER ON ALL NEW CONSTRUCTION BACKFLOW DEVICES FOR SIZES 3/4" TO 2".
2. "GUARDSHACK™ ENCLOSURE" MODEL GS OR APPROVED EQUAL, PHOENIX, ARIZONA 85032 (602-788-5411)
3. AFTER ALL WELDING, ELECTROSTATIC APPLICATION OF POWDER SHALL BE FUSION BONDED TO ENTIRE ENCLOSURE. (HUNTER GREEN)
4. ALL BOLTS SHALL BE ZINC PLATED.

**BACKFLOW PREVENTION DEVICE ENCLOSURE**



Sunnyvale

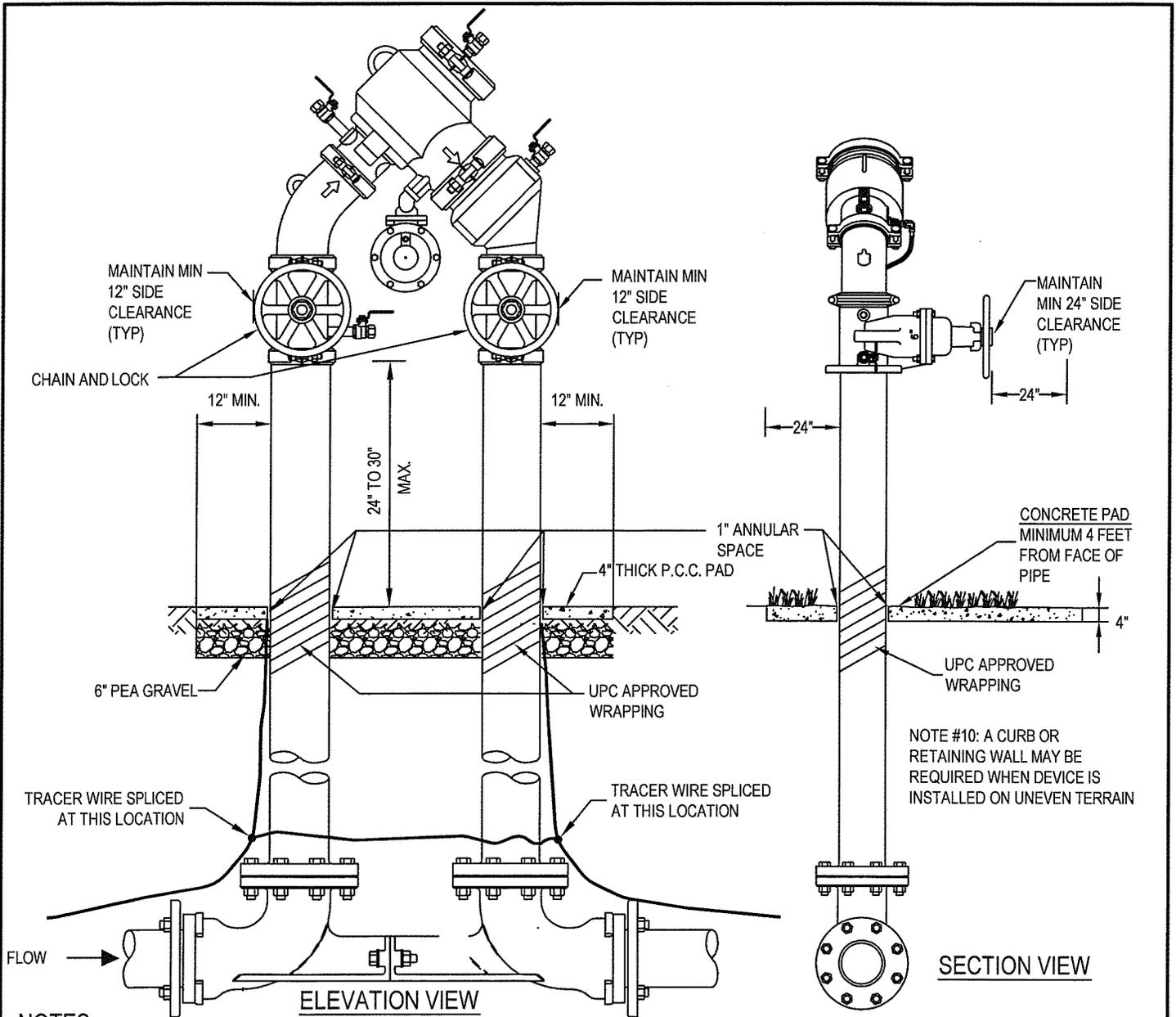
*[Handwritten Signature]*

APPROVED BY:

DATE: JUNE 30, 2006

REVISED: JULY 2019

19B



**NOTES:**

1. REDUCED PRESSURE PRINCIPLE TYPE BACKFLOW DEVICES SHALL BE WILKINS, FEBCO APPROVAL EQUAL PER USC LIST OF APPROVED BACKFLOWS.
2. REDUCED PRESSURE PRINCIPLE TYPE BACKFLOW DEVICES SHALL BE REQUIRED FOR THE PROTECTION OF THE PUBLIC WATER SUPPLY. (NO DOUBLE CHECK VALVE ASSEMBLIES, SEE AIR GAP)
3. BACKFLOW DEVICES SHALL BE INSTALLED ADJACENT TO AND ON PROPERTY SIDE OF SIDEWALK WHERE APPLICABLE. THE ASSEMBLY SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE WATER METER AS APPROVED BY THE CITY'S CROSS CONNECTION PERSONNEL.
4. ALL DEVICES WILL HAVE RESILIENT SEATED SHUT - OFF VALVES. TEST COCKS WILL HAVE THREADED ENDS.
5. PRESS. DIFFERENTIAL VALVE OPENING TO BE 24" MINIMUM ABOVE GRADE
6. ALL PIPES AND SPOOLS SHALL BE DUCTILE IRON WITH NO EXCEPTIONS AND ALL JOINTS FLANGED.
7. ALL BOLTS/NUTS SHALL BE STAINLESS STEEL COMPONENTS WITH NO EXCEPTIONS.
8. DO NOT PAINT BRASS FITTINGS.
9. VALVE CONFIGURATION DECIDED ON JOB SITE.
10. ON SLOPING SURFACES, CONTRACTOR SHALL INSTALL A CONCRETE CURB/ WALL OR EQUIVALENT AROUND THE BACKFLOW.
11. THE PORTION OF THE TRENCH FROM BACK OF METER SHALL REMAIN OPEN UNTIL WATER DISTRIBUTION PERSONNEL HAVE INSPECTED AND APPROVED THE INSTALLATION, CALL 669-600-7322.
12. THE VALVE HANDWHEELS SHALL BE DOUBLE-LOCKED USING GALVANIZED STRAIGHT LINK CHAIN THAT LOCKS THE VALVE HANDWHEELS IN THE OPEN POSITION AND EITHER LOCK WILL RELEASE THE CHAIN.
13. BACKFLOW DEVICES SHALL BE LEAD FREE.
14. BACKFLOW ASSEMBLIES SHALL BE THE SAME SIZE AS THE METER.

**VERTICAL ORIENTATION DOMESTIC RP ASSEMBLY BACKFLOW PREVENTION DEVICE SIZE 3" AND LARGER**

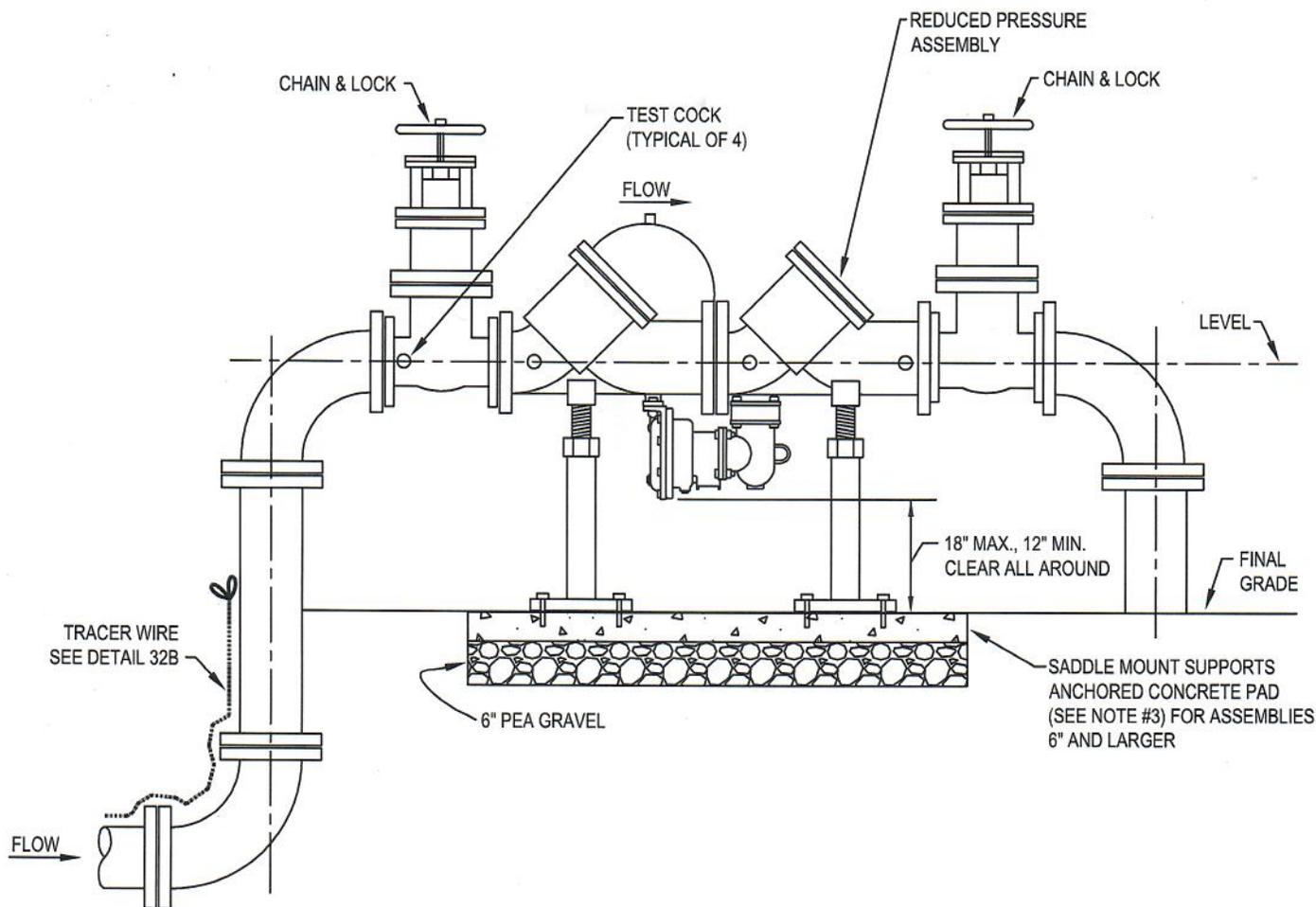


Sunnyvale

*[Signature]*  
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DATE: JUNE 30, 2006  
REVISED: JULY 2019

DWG. 20B



**NOTES:**

1. ALLOWED BACKFLOW ASSEMBLIES AND THEIR ORIENTATIONS SHALL BE LIMITED TO THOSE SPECIFIED ON THE "LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES" BY THE UNIVERSITY OF SOUTHERN CALIFORNIA'S FOUNDATION FOR CROSS-CONNECTION CONTROL AND HYDRAULIC RESEARCH, LATEST VERSION.
2. THE BACKFLOW DEVICE SHALL BE LOCATED ON PRIVATE PROPERTY: AS CLOSE AS PRACTICAL TO THE USER'S CONNECTION AND SHALL BE INSTALLED A MINIMUM OF TWELVE INCHES (12") ABOVE GRADE AND NOT MORE THAN EIGHTEEN INCHES (18") ABOVE GRADE MEASURED TO THE BOTTOM OF THE DEVICE AND WITH A MINIMUM OF TWELVE INCHES (12") SIDE CLEARANCE.
3. CONCRETE PAD SHALL BE CLASS B CONCRETE, 4" MINIMUM THICKNESS, REINFORCED WITH WELDED WIRE MESH.
4. WHERE SERVICE LINES SMALLER THAN 4" PASS UNDER A SIDEWALK, THEY SHALL BE INSTALLED IN A PVC CASING / SLEEVE AT LEAST 1" LARGER THAN THE SERVICE LINE AND EXTENDS AT LEAST 6" BEYOND THE EDGES OF THE SIDEWALK.
5. METAL PIPES EXPOSED TO SOIL OR CONCRETE SHALL BE POLY WRAPPED AND TAPED.
6. THE PORTION OF THE TRENCH FROM BACK OF METER TO THE DEVICE SHALL REMAIN OPEN UNTIL WATER DISTRIBUTION CROSS-CONNECTION PERSONNEL HAVE INSPECTED AND APPROVED THE INSTALLATION. CALL 669-600-7322.
7. THE TESTING SIDE OF THE DEVICE SHALL HAVE A MINIMUM 24" OF CLEARANCE FROM OBSTRUCTION (NON-TRIMMABLE LANDSCAPING, BUILDINGS, UTILITIES, ETC.) MULTIPLE BACKFLOW DEVICES SHALL BE SEPARATED BY A MINIMUM OF 18" AND BE OF EQUAL HEIGHT.
8. BOLLARDS MAY BE REQUIRED BY CITY TO PROVIDE ADDITIONAL PROTECTION.
9. BACKFLOW ASSEMBLIES INSTALLED ON PORTABLE WATER SERVICES SHALL BE LEAD FREE.
10. BACKFLOW ASSEMBLIES SHALL BE THE SAME SIZE OF THE WATER METER.
11. NO GALVANIZED PIPE OR DISSIMILAR METAL PIPE MAY BE USED.
12. ALL PIPES AND SPOOLS SHALL BE DUCTILE IRON PIPE WITH NO EXCEPTIONS AND ALL JOINTS FLANGED.
13. ALL BOLTS / NUTS SHALL BE STAINLESS STEEL COMPONENTS WITH NO EXCEPTIONS.

**HORIZONTAL ORIENTATION DOMESTIC  
RP ASSEMBLY BACKFLOW PREVENTION  
DEVICE SIZE 3" AND LARGER**



Sunnyvale

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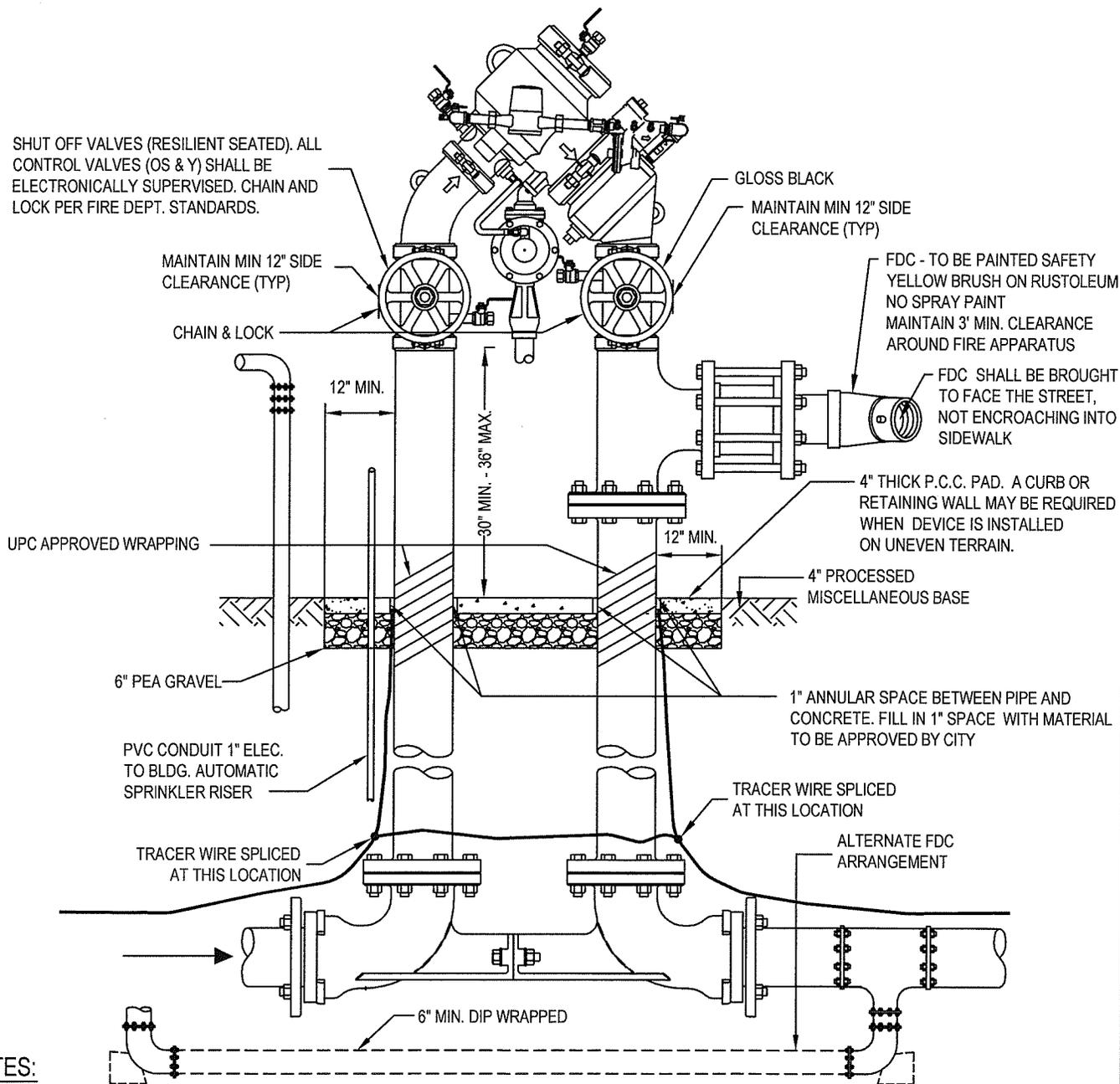
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DATE: SEPTEMBER 2020

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20B-1

SHUT OFF VALVES (RESILIENT SEATED). ALL CONTROL VALVES (OS & Y) SHALL BE ELECTRONICALLY SUPERVISED. CHAIN AND LOCK PER FIRE DEPT. STANDARDS.



**NOTES:**

1. REDUCED PRESSURE DETECTOR ASSEMBLY SHALL BE WILKINS 475DA OR PRIOR APPROVED EQUAL (RPDA REQUIRED IF CHEMICALS ARE INTRODUCED TO SYSTEM).
2. FDC TO BE PAINTED SAFETY YELLOW AND REMAIN VISIBLE AND ACCESSIBLE.
3. ALL PIPES AND SPOOLS SHALL BE DUCTILE IRON WITH NO EXCEPTIONS AND ALL JOINTS FLANGED. DIP TO BE PROTECTED WRAP CA-1200 POLYGUARD CA-14 MASTIC OR APPROVED EQUAL. NO GALVANIZED PIPE IS TO BE INSTALLED.
4. ALL TRIM HARDWARE TO BE BRASS OR BRONZE WITH NO EXCEPTIONS.
5. RADIO READ METER FEE TO BE PAID AT TIME OF PERMIT APPLICATION (METER TO BE INSTALLED BY CITY).
6. UNDERGROUND FITTINGS TO BE FUSION EPOXY COATED, CONNECTIONS TO BE FLANGED OR MEGALUG WITH FLUOROPOLYMER (TRIPAC) COATED BOLTS AND NUTS OR 316 STAINLESS STEEL BOLTS AND NUTS OR A COMBINATION OF THE TWO.
7. FOR SECTION VIEW PLEASE SEE 20B.
8. THE PORTION OF THE TRENCH FROM BACK OF METER SHALL REMAIN OPEN UNTIL WATER DISTRIBUTION PERSONNEL HAVE INSPECTED AND APPROVED THE INSTALLATION, CALL 669-600-7322.
9. BACKFLOW DEVICES SHALL BE LEAD FREE.

**FIRE SERVICE - REDUCED PRESSURE DETECTOR ASSEMBLY (RPDA)**



DATE : JUNE 30, 2006  
 REVISED: JULY 2019

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2. Fire services shall be sized by fire protection engineers and as approved by City Fire Prevention.

#### Water Service Location:

The location of the water meter shall be at the back of sidewalk or back of curb within the public right-of-way where possible, and will require approval.

#### F. Backflow Prevention Devices

Backflow Prevention Devices shall be installed in compliance with the "City of Sunnyvale Water System Cross Connection Control Program Policies and Regulations". A backflow prevention assembly shall consist of 2 check valves and a pressure relief valve connected in series with 2 non-rising stem gate valves. Backflow prevention assemblies shall be the same size as the pipe main in which they are installed. The assembly shall be UL listed and approved by the Research Foundation for Cross Connection Control, University of Southern California. Fire department connections shall be painted safety yellow.

#### G. Meter and Meter Box Installation

The meter and meter box shall be furnished and installed by the City upon acceptance of the lateral service line, and the property owner has assumed responsibility for the connection on the discharge side of the meter. A backflow prevention device is required for all services 2" and larger. If deemed necessary by the City, a backflow prevention device may be required for smaller services. No meter shall be installed prior to full compliance with the cross connection control program.

#### H. Warranty Period

Installation of Water Services: The Contractor is responsible for maintenance and repairs to the service trench and pavement for a one-year warranty period after acceptance of the work by the City. One year after acceptance, the City will make a final inspection. If repairs have to be made, the contractor or developer will be notified to make repairs.

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DELETE **SUBSECTION 306-1.4.1 7)** AND SUBSTITUTE WITH:

#### 7) Hydrostatic Pressure Test:

Each run of pipe between two (2) sectionalizing valves or between a valve and a cap or plug as directed by the Engineer shall be tested for leakage. Only one (1) run of pipe shall be tested at a time, but pressure may be applied through sections of pipe already successfully tested. Services and fire hydrant runs may be tested individually or with sections of water main. It is the intention of these tests to test the water tightness of the closed gate valves as well as the piping.

The Contractor shall furnish all necessary equipment, materials and labor to perform the pressure