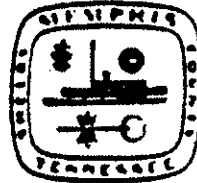


# Cross Connection Board

MEMPHIS AND SHELBY COUNTY



RICHARD C HACKETT  
*Mayor of Memphis*



CROSS CONNECTIONS

## BACKFLOW PREVENTION

## CONTROL PROGRAM



WILLIAM N. MORRIS, JR.  
*Mayor of Shelby County*

814 JEFFERSON AVENUE, MEMPHIS, TENNESSEE 38105



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C E R T I F I C A T I O N

STATE OF TENNESSEE  
COUNTY OF SHELBY

This is to certify that the below Code Sections, Resolutions, and Ordinances, have been duly adopted to utilize the Standard Plumbing Code and Appendice by the governing bodies of the City of Memphis, and County of Shelby; to create a Cross Connection Board; to appoint members to the Board; and to implement a Cross Connection Control Program.

TENNESSEE CODE ANNOTATED - SECTION 53-2004, et seq.

ORDINANCE NO. 2960, CITY OF MEMPHIS. ADOPTED  
DECEMBER 4, 1979, APPROVING THE STANDARD PLUMBING  
CODE AS PUBLISHED BY SOUTHERN BUILDING CODE CONGRESS  
INTERNATIONAL, INC., AND APPENDIX A, B, C, & D.

RESOLUTION ADOPTED BY THE COUNTY OF SHELBY.  
EXECUTED BY JAMES W. MOORE, COMMISSIONER, ON  
SEPTEMBER 4, 1975.

COUNTY OF SHELBY

By \_\_\_\_\_

The purveyor has on file certified copies of this authority as passed by city and county governing bodies.

## PROGRAM

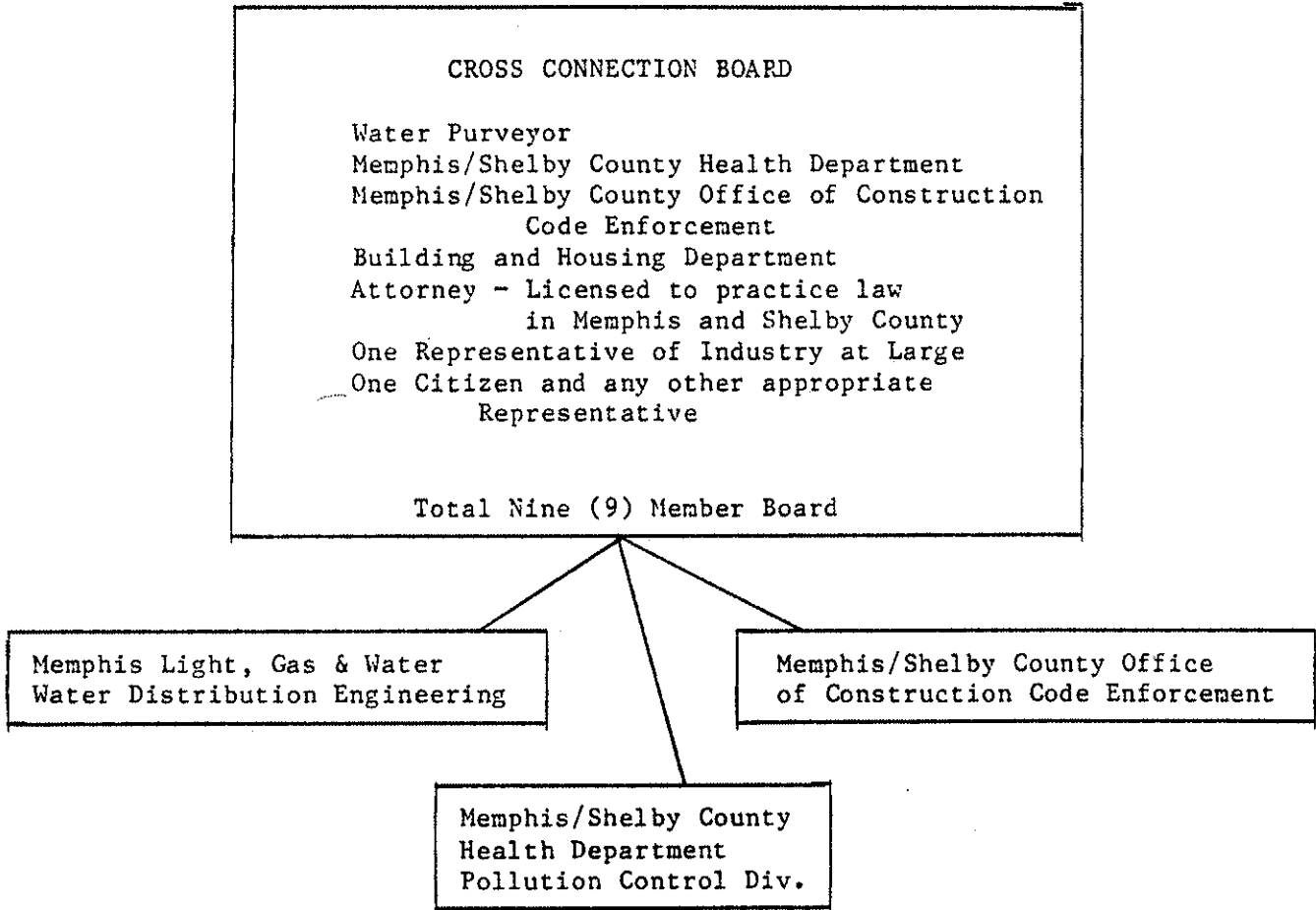
This Cross Connection Control Program will be implemented by the WATER PURVEYOR, the CITY and COUNTY PLUMBING DEPARTMENT, and the HEALTH DEPARTMENT, with the approval and guidance of the CROSS CONNECTION BOARD.

The PURVEYOR will provide inspection of the public water system to insure that adequate protection is provided at the point of entrance to the consumer, and where there is a question pertaining to the type of operation, assistance will be requested from the PLUMBING DEPARTMENT to inspect the consumer's premise. They will maintain records of backflow or back-siphonage devices installed, location and testing. They will notify the consumer if the device has not been tested in the last year. They will do follow up on testing, and installation of devices as needed. They will provide assistance to the PLUMBING DEPARTMENTS and HEALTH DEPARTMENT on internal plumbing problems within the consumer's premise. They will prepare an annual report on cross-connection control.

The PLUMBING DEPARTMENTS will provide a plan review section to determine the type of protection needed at the point of entrance to the consumer's water system, and internal protection provided for new installations. They will provide the PURVEYOR with the type of protection required at the point of entrance on approved plans. They will provide inspections of new installations to determine if protective devices have been installed and tested. They will provide inspections of existing plumbing within the consumer's premises as needed, and will assist the PURVEYOR and HEALTH DEPARTMENT in water system protection problems.

The HEALTH DEPARTMENT will provide inspections as needed in the interest of public health, and on request of the PURVEYOR or PLUMBING DEPARTMENT where there is a potential health hazard. Additional responsibilities as required in Appendix D, paragraph (c) under responsibilities of the Plumbing Code.

ORGANIZATIONAL STRUCTURE OF CROSS CONNECTION PROGRAM



## BOARD MEMBERS

The following is a list of the Cross Connection Board members appointed by the City of Memphis Mayor, and the Mayor of Shelby County.

CHARLES PICKEL  
Memphis Light, Gas & Water Division  
Manager of Water Distribution Engineering

DR. ANDREW DANCY  
701 E. Mallory, 38106

JOHN MAYS  
Memphis/Shelby County Office of  
Construction Code Enforcement  
160 N. Mid America Mall, #750, 38103

W. LEWIS WOOD, JR.  
Allen & Hoshall  
2430 Poplar, 38112

L.E. LANDERS  
Memphis/Shelby County Office of  
Construction Code Enforcement/Bldg. Section  
160 N. Mid America Mall, #750, 38103

SAMUEL MCKEE, JR.  
Industry Representative (Plumbing Contractor)  
5854 Scottsdale, 38115

DOROTHY OSRADKER  
City Attorney's Office  
125 N. Main #314, 38103

NORMAN C. LACHAPELLE  
Secretary/Memphis & Shelby County  
Cross Connection Board  
814 Jefferson, 38105

### General Information:

City resolution establishing Board Oct. 14, 1980. County  
All appointments require concurrence by both City and County.  
Vacancies are filled only for an unexpired term.  
Chairman selected from its members, annually.  
Board composed of nine (9) members. Majority to operate is 5. (To  
hold meetings).

## BOARD POLICY

It is the policy of the Cross Connection Board to require protection of the public water system and the water system of the consumer within the premise or property against actual or potential cross-connections commensurate with the degree of hazard.

This will require a backflow or back pressure preventer where there is a possibility of any foreign substance entering the public water system degrading its quality. The reduced pressure backflow preventer device shall be approved by the Cross Connection Board. The procedures for approval shall be the procedure used by the Water Quality Control Division of the Tennessee Department of Public Health and the Memphis and Shelby County Tennessee Plumbin code. This device shall be installed at the point of entrance to the consumer. The type of device is dependent on the degree of hazard. The installation, maintenance, and testing shall be the responsibility of the consumer, as required in Appendix D, paragraph (d) under responsibilities of the Plumbing Code.

Testing of backflow and back pressure devices shall be by a certified tester. The Board has accepted all testers previously certified until a new training program is established. It is agreed by the Board that every R.P. device installed for the purpose of preventing backflow be tested at least once per year by a certified tester.

The Cross Connection Board prepared the following list of establishments where the installations of R.P. devices at point of entrance would be required for new construction, and at existing locations after inspection of premises.

Car Washes	Homes for Aged with extensive care units
Film labs	Hospital - human or animal
Greenhouses and Nurseries	Penal institutions or jails
Labs	Printing companies
Medical bldgs. including clinics	Office Buildings/multi-use
Transportation Terminals	Restricted establishments
Stock yards	Sewage treatment plants & pumping stations
Mortuaries & Morgues	Dry cleaning & laundry establishments
Power plants	Storm water pumping
Water front facilities & Ind.	Installations having sprinkler systems
Auxiliary water supplies	
Water treatment plants	
Manufacturing Plants - including but not limited to:	
Breweries	Auto Plants
Air craft plants	Dye Works
Cold storage plants	Beverage bottling plants
Fertilizer plants	Canneries
Paper products	Chemical plants
Poultry houses	Dairies
Reduction plants	Food processing
Manufacturing (toxics)	Metal plating
Meat packing & rendering	Petroleum processing

## RESPONSIBILITIES

### Certified Backflow Prevention Device Tester

It shall be the responsibility of the tester to provide all the equipment necessary to test backflow prevention devices properly. A certified tester shall be qualified to complete the test report form by virtue of having been certified jointly by the Cross Connection Board and the State of Tennessee Office of Water Management, A tester may be certified if said individual has completed the certification course of study and is a member of an establishment's maintenance staff as long as said individual remains a member of an establishment's staff; is a licensed plumber or is an employee or other representative of a licensed plumber; or is an independent bonded individual. If said tester is not a licensed plumber or representative thereof or a member of an establishment's maintenance staff, said individual shall file with the Secretary of the Cross Connection Board a five thousand (\$5,000) bond and proof of any necessary business license. Further, any representative of a licensed plumber shall operate under the license and name of said plumber; an independent tester shall not hold himself out to the public as a licensed plumbing company. A tester who qualifies as a member of an establishment's maintenance staff may test backflow prevention devices of that establishment only.



The tester shall be responsible for notifying the consumer of a malfunction of the device. A certified tester shall perform the test and be responsible for the competency and accuracy of all tests and reports. He shall be required to renew his certification every three years. The tester shall be responsible for certifying the test performed and providing the consumer with the original and one copy. The original is to be certified by the consumer as provided below and forwarded to the water purveyor; copies are to be retained by the tester and the consumer. The reading on the RP device kit shall not be rounded off to the nearest whole number.

#### Consumer

It is the responsibility of the consumer to have backflow or back-siphonage devices tested by a certified tester and the results recorded on forms supplied by the water purveyor. It will be the consumers' responsibility to insure that the tester has certified the completed test and certify that the device was in constant use and was not by-passed, made inoperable, or removed. After completion, the consumer will mail the original test form to the water purveyor. It will also be the consumer's duty to notify the water purveyor if there is any change in the type of operation, additions, or alterations. On new installations, the consumer will be required to have the device tested prior to being put in service.

Standard Plumbing Code adopted by city and county governing bodies of which these sections of Chapter 12 are a part.

## CHAPTER XII

### WATER SUPPLY AND DISTRIBUTION

#### 1201 - QUALITY OF WATER SUPPLY

##### 1201.1 - POTABLE WATER

Potable water is water which is satisfactory for drinking, culinary, and domestic purposes, and which meets the requirements of the Health Authority having jurisdiction.

##### 1201.2 - ACCEPTABLE SOURCES

Where a public supply of potable water is not available, requirements satisfactory to the Governing Authority shall be observed.

##### 1201.3 - NON-POTABLE WATER

Non-potable water may be used for flushing water closets and urinals and other fixtures not requiring potable water, provided such water shall not be accessible for drinking or culinary purposes.

#### 1202 - COLOR CODE

##### 1202.1 - IDENTIFICATION OF PIPING

All piping conveying non-potable water shall be adequately and durably identified by a distinctive yellow-colored paint so that it is readily distinguished from piping carrying potable water. (See ANSI Z53-1-1953 Safety Color Code for Marking Physical Hazards.)

Where non-potable water is used, all valves, branch fittings and brach terminals shall be identified by the words "non-potable water." This identification may be by signs or by the use of brass tags which are permanently affixed to the pipes, valves, etc. Such identification shall not be concealed by pipe insulation and when insulated, the insulation shall be painted the same yellow color as is required for the pipe. Maintenance of all identification shall be the responsibility of the owner.

## 1203 - WATER SUPPLY MANDATORY

### 1203.1

Every building used for human occupancy or habitation in which plumbing fixtures are installed shall be provided with an ample supply of potable water.

## 1204 - PROTECTION OF POTABLE WATER SUPPLY

### 1204.1 - CROSS CONNECTIONS

Potable water supply piping, water discharge outlets, backflow prevention devices or similar equipment shall be so located as to make impossible their submergence in any contaminated or polluted liquid or substance.

(See Appendix D of this Code for additional rules and regulations on Cross Connection, Backflow or Back-siphonage Control.)

### 1204.2 - APPROVAL OF DEVICES

Before any device for the prevention of backflow or back-siphonage is installed, it shall have first been certified as meeting the requirements of ANSI A40.6-1943, ASSE 1001-1966 revised 1970, ASSE 1011-1970, ASSE 1012-1972, ASSE 1013-1971, ASSE 1015-1972, or AWWA C-506-69 by a recognized testing laboratory acceptable to the Plumbing Official. Devices installed in a potable water supply for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices. The Plumbing Official having jurisdiction may inspect such devices, and if they are found to be defective or inoperative, shall require the replacement thereof.

### 1204.3 - BACKFLOW

The water distribution system shall be protected against backflow. Every water outlet shall be protected from backflow, preferably by having the outlet end from which the water flows spaced a distance above the flood-level rim of the receptacle into which the water flows sufficient to provide a "minimum required air gap" as defined in ANSI.1.2-1942. Where it is not possible to provide a minimum air gap, the water outlet shall be equipped with an accessibly located backflow preventer complying with Section 1204.2.

#### 1204.4 - SPECIAL DEVICES

Where it is not possible to provide either a minimum air gap or a backflow preventer, as may be the case in connection with cooling jackets, condensers or other industrial or special appliances, the Plumbing Official shall require other approved means of protection.

#### 1204.5 - BACKFLOW PREVENTER INSTALLATION

Backflow preventers shall not be buried and backflow preventers shall be so installed and so located as to prevent any relief opening from being submerged. When backflow preventers are installed in vaults (pits) which extend below grade level, relief outlets shall be piped full size directly to the outside of the vault, with relief piping terminating in a downward direction at a point not less than 12 inches above grade. An opening shall be provided in the vault wall at one-half the distance between the relief piping terminus and grade. This opening shall be at least four times the diameter of the relief outlet piping or, if smaller openings are desired, they shall be not less than four in number, each being 2.5 times the diameter of the relief outlet pipe. Sufficient clearance from the device on all sides shall be provided to permit testing in place or removal for maintenance.

Vault installations are not recommended and shall be avoided except where necessary to protect the device from damage. In any case, vaults shall be so constructed and equipped with positive drain openings as to prevent any part of the device from being submerged.

#### 1204.6 - GATE VALVES AND TEST COCK REQUIRED

All pressure type backflow preventers which are designed for periodic field testing after installation in the pipe line shall be equipped with gate valves on both the inlet and the outlet side of the backflow preventer. In addition, test cocks shall be provided and so located that test equipment, gauges, etc., may be connected to the device at such points that the pressure in each pressure zone may be detected and, in addition, a test cock shall be located up-stream of the up-stream gate valve or installed in a special tapping on the up-stream side of the up-stream gate valve. But, in any case, such test cock shall be accessibly located as close to the device as practical. Where applicable approved standards specify otherwise, the location of test cocks shall be as specified by the standard.

## 1205 - VACUUM BREAKERS AND AIR GAPS

### 1205.1 - FLUSHOMETER

Flushometers shall be equipped with an approved vacuum breaker. The vacuum breaker shall be installed on the discharge side of the flushing valve with the critical level at least 4-inches above the overflow rim of the bowl.

### 1205.2 - FLUSHING TANKS

Flushing tanks shall be equipped with an approved ball-cock. The ball-cock shall be installed with the critical level of the vacuum breaker at least 1-inch above the full opening of the overflow pipe. In cases where the ball-cock has no hush tube, the bottom of the water supply inlet shall be installed at least 1-inch above the full opening of the overflow pipe.

### 1205.3 - TROUGH URINALS

Trough urinals shall be equipped with an approved vacuum breaker installed on the discharge side of the last valve and not less than 30-inches above the spray pipe.

### 1205.4 - LAWN SPRINKLERS AND IRRIGATION PIPING SYSTEMS

Lawn sprinkler systems and irrigation piping systems shall be equipped with an approved backflow preventer to protect against contamination of the potable water system. The following devices shall be acceptable:

Anti-syphon vacuum breakers, reduced pressure zone backflow preventer, double check type back pressure backflow preventer equipped with gate valves and test cocks.

Above devices shall have been certified by a recognized testing laboratory acceptable to the Plumbing Official as meeting the requirements of ANSI-A-40.6, ASSE-1013, ASSE-1015 or AWWA-C-506-69.

Anti-syphon valves complying with ANSI-A-40.6 shall be installed downstream of the last control valve at least 6 inches above the level of the highest sprinkler head.

All protective devices shall be installed in an accessible location to allow for inspection and maintenance and to isolate the sprinkler system from all other piping in the system.

1205.5 - FIXTURE VALVE OUTLETS WITH HOSE ATTACHMENTS,  
HOSE BIBBS AND LAWN HYDRANTS

Fixture valve outlets with hose attachments, hose bibbs and lawn hydrants shall be protected by an approved back-siphonage backflow preventer or vacuum breaker on the discharge side of the valve. Back-siphonage backflow preventers may be installed directly on hose outlet connection threads. Vacuum breakers shall be installed at least six inches above the highest point of usage. Approved valves shall comply with applicable sections of American Society of Sanitary Engineering Standard-ASSE 1011-Hose Bibb Vacuum Breakers.

In areas subject to temperatures of 32 degrees Fahrenheit or below, all hose bibb vacuum breakers shall be of such design that the hydrant may be drained without removing the backflow preventer from the hydrant. Regardless of area temperature, hose bibb vacuum breakers shall be designed and installed to prevent total removal from the hose bibb after installation in accordance with the provisions of this code and the manufacturer's instructions.

1205.6 - WATER SUPPLY TO STEAM AND HOT WATER HEATING  
BOILERS, HEAT EXCHANGERS, ETC.

A backflow preventive device which will automatically vent to atmosphere shall be installed in the water supply line to all steam and hot water space heating boilers and heat exchangers, etc., being supplied from the potable water system. Such devices shall prevent back-siphonage and backflow from the heating system into the potable water supply lines should the supply pressure fall below the pressure in the heating system. Such devices shall have double seated spring-loaded soft disc check members separated by an intermediate air break chamber, and shall have sufficient flow capacity to satisfy the requirements of the equipment to which the water is supplied.

Devices shall be constructed of brass and bronze materials with discs and/or diaphragms of silicone rubber capable of withstanding hot water up to 200° F and which will not stick to their seats after prolonged continuous seating. Devices shall be suitable for use on supply pressures up to 150 psi and shall be capable of working with a back pressure from 1 to 75 psi without leaking or permanent damage or distortion.

Such devices shall be certified to the inspection authority as meeting these requirements and A.S.S.E. Standard 1012 or 1013 and shall bear such identification as is required by the applicable standard.

STANDARD PLUMBING CODE ADOPTED BY CITY AND  
COUNTY GOVERNING BODIES OF WHICH APPENDIX D  
IS A PART.

A P P E N D I X D

CROSS CONNECTION, BACKFLOW AND BACK-SIPHONAGE CONTROL

D-1. INTENT, PURPOSE AND CONTROL

- (a) It is the intent of this Appendix to recognize that there are varying degrees of hazard to potable water within the water main and water supply systems, and it is the intent to apply the principle that the degree of protection should be commensurate with the degree of hazard.
- (b) The purpose of this Appendix is:
  - (1) To protect the public water main against actual or potential cross connections, backflow and back-siphonage by isolating, within the premise or private property, contamination or pollution that has occurred or may occur because of some undiscovered or unauthorized cross connection on the premise or private property.
  - (2) To protect the water supply system within the premise or private property against actual or potential cross connection, backflow and back-siphonage by requiring such air gaps, vacuum breakers, backflow preventers, reduced pressure principle backflow preventers, and special devices, as required by this Appendix or other applicable regulations.
  - (3) To eliminate cross connections, backflow and back-siphonage of any other source of water or process water used for any purpose whatsoever which may jeopardize the safety of the water supply or which may endanger the health and welfare of the general public.
  - (4) To establish a cross connection, backflow and back-siphonage control program.

- (c) Cross connection, backflow and back-siphonage control requires cooperation between water purveyors, the public health officer, the Plumbing Official, and the consumer. The responsibilities and duties of each shall be as set forth in this Appendix, and other applicable regulations. Where circumstances do not make feasible or necessary the establishment of a control committee, or the participation in enforcement by the public health officer, or the water purveyor, the local governing body may provide the Plumbing Official with other means to administer and enforce the control program.

D-2 RESPONSIBILITIES

- (a) The Plumbing Official shall enforce the provisions of this Code so as to insure the potability of the consumer's water supply, from the point of entrance of the public water supply to the extremities of the consumer's water system. The Plumbing Official has primary enforcing responsibility of new installations, alterations, or repairs of water supply systems. He shall provide the Health Officer and the Water Purveyor with the assistance required to enforce the provisions of this Appendix on existing water supply systems.
- (b) The Water Purveyor is primarily responsible for the prevention of contamination and pollution of the public water mains. Such responsibility begins at the point of origin of the public water supply and includes adequate treatment facilities and water mains, and ends at the point of entrance to the consumer's water system, provided adequate backflow and back-siphonage protection is maintained on all water supply systems directly connected to the Water Purveyor's public system. The Water Purveyor has secondary supervisory responsibility to the Plumbing Official for new installations, alterations or repairs of water supply systems and has secondary supervisory responsibility to the Health Officer for existing water supply systems.



- (c) The Health Officer, when administrative head of water quality control, is responsible for supervising the prevention of contamination and pollution of the public water main, all water supply systems, and all water sources. Such responsibility extends from the point of origin of the public water supply to and including all extremities of the consumer's supply and its actual use. The Health Officer has prime supervisory responsibility for administration and enforcement of those portions of the Cross Connection. Backflow and Back-Siphonage Control Program applicable to existing water supply systems and water sources. The Health Officer has secondary supervisory responsibility to the Water Purveyor for the public water system.
- (d) The Consumer has the prime responsibility of preventing contaminants and pollutants from entering the water supply system, and from entering the public water main or water source from his water supply system. The Consumer shall protect his water supply system against actual or potential cross connection, backflow or back-siphonage, as required by this Appendix, and other applicable regulations. He shall assure that all protective devices are tested and maintained in the working condition required. He shall assure the necessary plumbing permits are obtained for new water supply system installations, and for alterations or repair to existing systems, as required by this Appendix.
- (e) A Cross Connection, Backflow and Back-Siphonage Control Board, when established, shall assist the Plumbing Official, the Water Purveyor, and the Health Officer in the enforcement of this Appendix, and other applicable regulations. Complaints of any citizen shall be brought before the Board for review and recommendation to the local governing body having jurisdiction. The Board shall also serve as an appeals board in the manner hereinafter set forth.

D-3 DEFINITIONS

Definitions contained in Chapter III of the Standard Plumbing Code shall also apply, except where the following special definitions shall apply:

**BACK-SIPHONAGE BACKFLOW.** A reversal of the normal direction of flow in the pipeline due to a negative pressure (vacuum) being created in the supply line with the backflow source subject to atmospheric pressure.

**BACKFLOW PREVENTER.** A device to prevent backflow. As there are two conditions of backflow, the device should be identified by the conditions which it is designed to prevent. (See Back Pressure, Backflow Preventer, Backflow Preventer/Reduced Pressure Type, Back-siphonage Backflow Preventer.)

**BACK PRESSURE BACKFLOW PREVENTER.** A device to prevent backflow due to a general condition in which the pressure in the system becomes greater than the supply pressure. The system being above atmospheric pressure. (See also Check Valves Assembly.)

**BACKFLOW PREVENTER/REDUCED PRESSURE TYPE.** A device having dual check valves force-loaded, or biased, to a normally closed position, a chamber or zone between the check valves in which pressure is normally lower than the supply pressure, a relief or vent valve force loaded to a normally open position located in the zone to automatically open a passage between the zone and the atmosphere should the zone pressure, for any reason, tend to equalize with or exceed the supply pressure.

**BACK-SIPHONAGE BACKFLOW PREVENTER, GENERAL.** A device or combination of devices for preventing back-siphonage in a water supply line.

**CHECK VALVES ASSEMBLY.** A combination of spring and weight loaded check valves with resilient discs for the intended purpose of preventing back pressure backflow in a water supply line. Assembly is usually furnished with test cocks for field testing the tightness of the check valves. Some assemblies include a "Vacuum Breaker" to admit atmospheric air downstream of the assembly.

**CONSUMER.** The term consumer shall mean any person, firm or corporation using or receiving water from the Authority's water system.

**CONTAMINANTS.** Any foreign materials, solid or liquid, not common to the potable water supply and which make it unfit or undesirable for human or animal consumption.

**CONTAMINATION.** The admission of contaminants into the potable water supply.

CROSS CONNECTION. Any connection by means of which contaminants of any kind can be caused to enter the potable water supply system.

WATER PURVEYOR. The term water purveyor shall mean the owner or operator of the public potable water system supplying an approved water supply to the public. As used herein, the terms water purveyor and municipal water authority may be used synonymously.

D-4 REGULATIONS.

- (a) No water service connections to any premises shall be installed or maintained unless the potable water and water supply are protected against actual or potential contamination or pollution in the manner required.
- (b) In the event of contamination or pollution of a potable water system, the Consumer shall notify immediately the Plumbing Official, the Health Officer or the Water Purveyor in order that appropriate measures may be taken to overcome the contamination or pollution.
- (c) The Plumbing Official, the Health Officer, the Water Purveyor, or their authorized representative, shall have the right to enter any building, structure, or premises, to perform any duty imposed upon him by the Code.
- (d) Nothing herein shall relieve the Consumer of the responsibility for conducting, or causing to be conducted, periodic surveys of water use practices on his premises to determine whether there are actual or potential cross connections in the Consumer's water system through which contaminants or pollutant's could flow back into a public water system or a potable Consumer's water system.
- (e) It shall be the duty of the Plumbing Official, the Health Officer, and the Water Purveyor, to cause inspections to be made of all properties containing potable water systems and where cross connection, backflow and back-siphonage is deemed possible. the frequency of inspections shall be as established by the Cross connection, Backflow and Back-Siphonage Control Board. On request the Consumer shall furnish to the inspection agency any pertinent information regarding the water supply system on such property.

- (f) It shall be the duty of the Cross Connection, Backflow and Back-Siphonage Control Board to establish the regulations required to prevent contamination and pollution of potable water. These regulations shall be uniform, taking into account the varying degrees of hazards for various premises, and shall properly utilize airgaps or preventive principles, devices tests, maintenance and repair, as contained in ASSE Standards: No. 1001-70 - Hose Connection Type Vacuum Breakers; No: 1012-72 - Backflow Preventers with Intermediate Atmospheric Vent; No. 1013-71 - Reduced Pressure Principle Back Pressure Backflow Preventers; and No: 1015-72 - Double Check Valve Back Pressure Backflow Preventers, or as contained in AWWA Standard AWWA C506-69 - Backflow Prevention Devices/Reduced Pressure Principle and Double Check Valve Types.
- (g) The Plumbing Official, the Health Officer, and Water Purveyor, or their authorized representatives, shall notify the Consumer of the preventive actions required. The Consumer has the right of appeal to the Board.
- (h) Water service shall be discontinued after reasonable notice to the Consumer if a violation of this Appendix exists on the premises, and such other precautionary measures shall be taken as are deemed necessary to eliminate any danger to the potable water. Water service shall not be restored until the danger has been eliminated in compliance with the provisions of this Appendix.
- (i) The Consumer shall keep records on his testing, maintenance and repair activities and shall make these records available upon request.

D-5

RECOMMENDED REGULATIONS TO ESTABLISH THE CROSS-CONNECTION,  
BACKFLOW AND BACK-SIPHONAGE CONTROL BOARD.

- (a) When established, the (name of State, City or County) Backflow and Back-Siphonage Control Board, hereinafter referred to as "THE BOARD" shall be composed of the following: One representative of the Water Purveyor, one member of the Plumbing Inspection Department, one member of the Building and Housing Department, one member from the Health Department, one attorney licensed to practice law in Tennessee, one representative of industry at large, one citizen, and any other appropriate representative which may be appointed. The term of office for these members shall be established under the applicable procedure of the government authority.

- (b) The Board shall select annually a Chairman from among its members. The Board shall hold at least four regular meetings each year and such additional meetings as the Chairman deems necessary. All hearings shall be held before not less than a majority of the Board.
- (c) In addition to the other duties set forth in this Appendix, the Board is hereby vested with the authority to decide appeals from any decision, ruling or determinations of the inspection agency.
- (d) Any person seeking a variance from the provisions of this Appendix or any person taking exception to and who is uniquely affected by any decision, ruling, requirement, rule, regulations, or order of the inspection agency may take an appeal to the Board as established by this Section. Such appeals shall be made within fifteen (15) days after receiving notice of such decision, ruling, requirement, rule, regulation, or order, by filing a written notice of appeal directly to the Board specifying the ground thereof and the relief requested. Such an appeal shall act as a stay of the decision, ruling, requirement, rule, regulations, or order in question, until the Board has taken final action on the appeal; except when the inspection agency has deemed that a high hazard risk is involved. The Board, not less than thirty (30) days after the date of filing an appeal, shall set a date for the hearing and shall give notice thereof by mail to the interested parties.
- (e) Hearings before the Board shall be conducted in the following manner:
  - (1) The Chairman of the board shall act as the hearing examiner to conduct such hearings.
  - (2) Any person making an appeal who is uniquely affected by the action of the inspection agency may appear in person or by agent or attorney and present evidence both written or oral pertinent to the questions and issues involved and may examine and cross-examine witnesses.
  - (3) All testimony shall be under oath and recorded. The Board is authorized to have all the testimony transcribed and a transcript of such testimony, if transcribed, shall be made available to the respondents or any party to the hearing upon payment of the normal fee, which shall not exceed the cost of transcribing such testimony.

- (4) After due consideration of the written and oral statements, the testimony and arguments submitted at the hearing upon such complaint or upon default in appearance of the respondent on the return date specified in the formal notice of complaint, the Board shall issue and enter such final order or make such final determination as it shall deem appropriate, and shall immediately notify the respondent thereof, in writing, by certified mail. Such order or determination shall be approved by at least a majority of members of the Board. The Chairman shall vote only in case of ties.
- (5) Upon failure of the Board to enter a final order or determination within sixty (60) days after the final argument of any such hearing, the respondent shall be entitled to treat for all purposes such failure to act as a finding favorable to the respondent.
- (6) Any person aggrieved by any final order or determination of the Board hereunder may seek judicial review thereof by common law writ of certiorari. No judicial review shall be available until and after all administrative remedies have been exhausted.

### Complaints on Water

Taste, odor, and discoloration complaints will continue to be checked by Water Laboratory personnel of the water purveyor. If determined by the Manager and/or Water Quality Control Analyst that a cross-connection is possible and the water may be contaminated it will then revert to the emergency procedure.

### Emergency Procedures

When it is suspected that contamination in a water system has occurred from backflow, the Memphis and Shelby County Health Department will be contacted to co-ordinate the following procedures. The water purveyor and the respective plumbing department will work with the health official until the problem has been cleared.

- (A) The degree of (potential) hazard must be determined.
- (B) Samples must be taken for testing. Record sample points, time, date, volume, person taking sample and get sample and information to the appropriate laboratory for testing.
- (C) Drinking fountains and other consumption points must be removed from service and warning signs posted.
- (D) Inspect premises to determine point contaminant entered the system and other cross-connection immediately and set time for other cross-connections to be corrected.
- (E) When high hazard contamination has occurred in a system, the system shall not be placed in service until the cross-connection has been eliminated, the lines flushed, the water tested and proven the pipes and fixtures are free from contamination.
- (F) When low hazard contamination has occurred, lines may be placed back in service after the cross-connection has been found and plans have been made to eliminate it in a reasonable time. Also, the lines are to be thoroughly flushed and checked to insure that the contamination has been cleared.

APPROVED DOUBLE CHECK VALVE ASSEMBLIES  
 TENNESSEE DEPARTMENT OF HEALTH AND ENVIRONMENT  
 DIVISION OF WATER SUPPLY

April 1, 1988

<u>Company</u>	<u>Model</u>	<u>Size</u>
Ames	DC	4" 6", 8", 10"
	DCA	4", 6", 8"
Beeco (Hersey)	FDC -	3/4", 1", 2"
	HDC -	3/4", 1"
Cla-Val	D -	2", 2", 3", 4", 6, 8", 10"
	D2 -	3/4", 1", 1", 1"
Febco	805Y -	3/4", 1", 1", 2"
	805 Type YD	2", 3", 4", 6", 8", 10"
Hersey (Beeco)	#2	3", 4", 6", 8", 10"
	E-1	4", 6"
Kennedy (Grinnell)	1373 -	4", 6", 8", 10"
Mueller	H-9505	4", 6", 8", 10"
Orion (Toro)	BDC	3/4", 1", 3", 4"
	80-0070	1"
	9-2930	2"
Rain Bird	DCA-075-R	3/4"
	DCA-100-R	1"
	DCA-150-R	1"
	DCA-200-R	2"
	DCA-250-R	2"
	DCA-300-R	3"
	DCA-400-R	4"
	DCA-600-R	6"
	DCA-800-R	8"
	DCA-1000-R	10"
Viking	A-1	4", 6", 8", 10"
Watts	709 QT	3/4", 1", 1", 2"
	709 RW	2", 3", 4", 6", 8", 10"
	709 RW Bronze	2", 3"
Wilkins	550	1", 1", 2", 2", 3", 4", 6"
	550-A	3/4", 1"
(Neptune)	MBD	10", (6" x 6" x 10" Manifold)

Note: Only units currently approved by the Division of Water Supply are to be used for the protection of Public Water Systems against backflow hazards. For information on any units which may have been approved since printing of this list call (615) 741-6636.



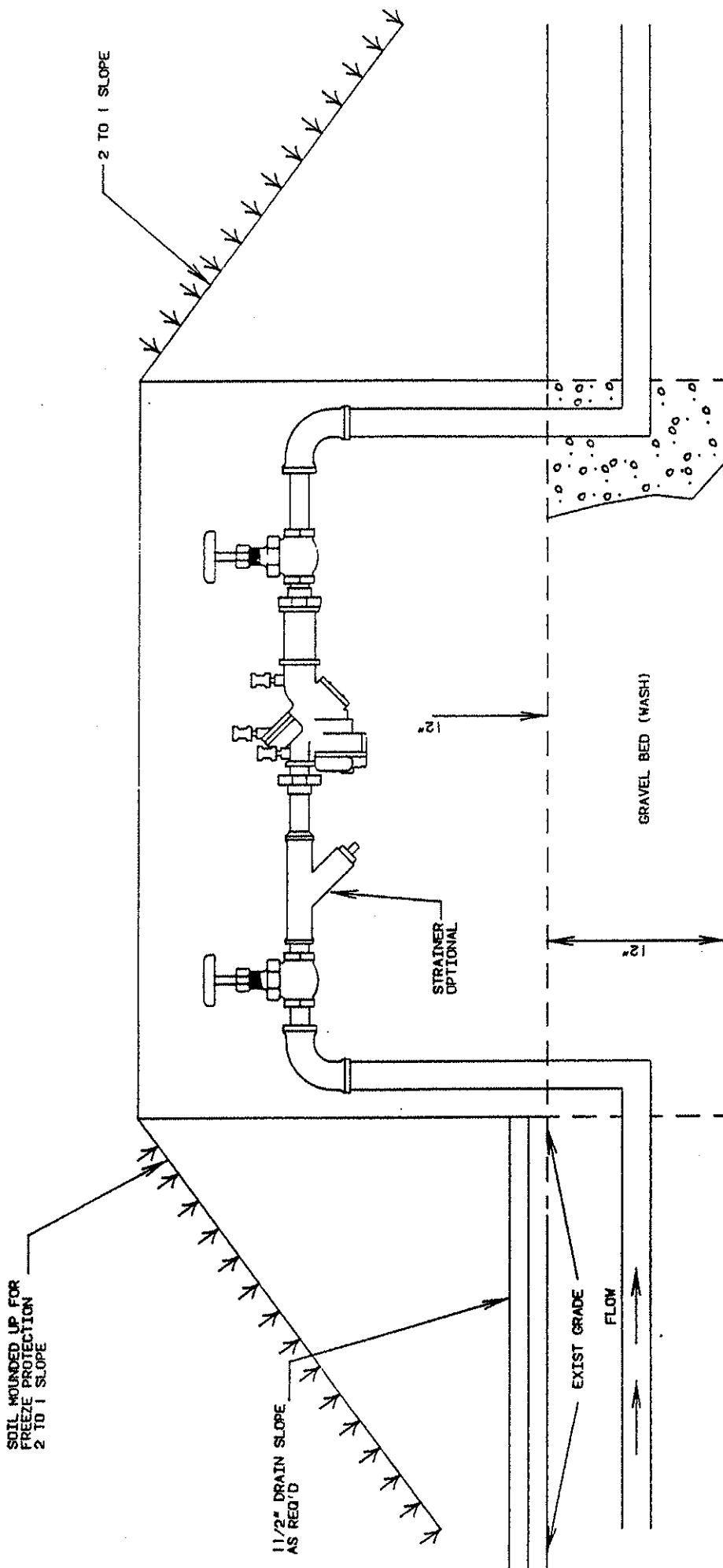
APPROVED MODELS NO LONGER IN PRODUCTION

<u>Brand Name</u>	<u>Model</u>	<u>Size</u>
<u>BEECO</u>	#6C	1", 1 ", 2", 2 ", 3", 4", 6", 8", 10"
	#6	2", 2 ", 3", 4", 6", 8", 10"
	#10	1", 1 ", 2", 3", 4"
	#10L	2"
	#12	3/4"
	#14	3/4", 1", 1 ", 2", 2 ", 3"
	FRP*	3/4", 1"
<u>CRANELINE</u>	A	1", 1 ", 2", 2 ", 3", 4", 6", 8", 10"
<u>FEBCO</u>	#825	1 ", 2", 2 "
	#835	3/4", 1", 1 ", 2"
	#835B	3/4", 1", 1 ", 2"
<u>BADGER</u>	#1	3/4", 1", 1 ", 1 ", 2", 2 ", 3", 4", 6"
<u>CLA-VAL</u>	RP	2", 2 ", 4", 6", 8", 10"
<u>ROCKWELL</u>	#701	1 ", 2", 2 ", 3", 4", 6"
<u>WATTS</u>	#900	3/4", 1", 1 ", 1 ", 2", 2 ", 3", 4", 6"
<u>ITT-LAWLER</u>	RZ12	3"
	RZ16	4"
	RZ24	6"
	RZ32	8"
	RZ40	10"

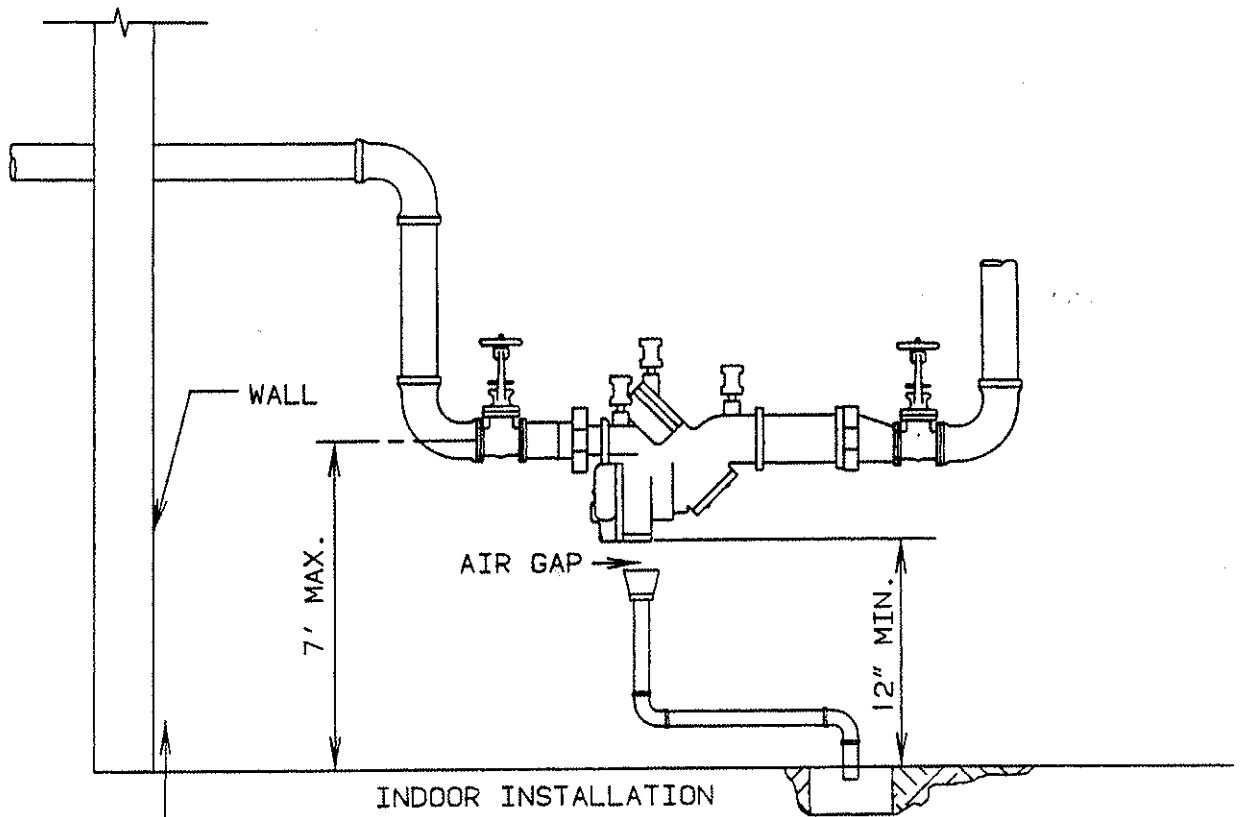
\*U.S.C. Foundation for Cross-Connection Control & Hydraulic Research installation requirements: Units must be installed with device rotated 45° about the pipeline axis with No. 2 test cock downward.

### General Guidelines

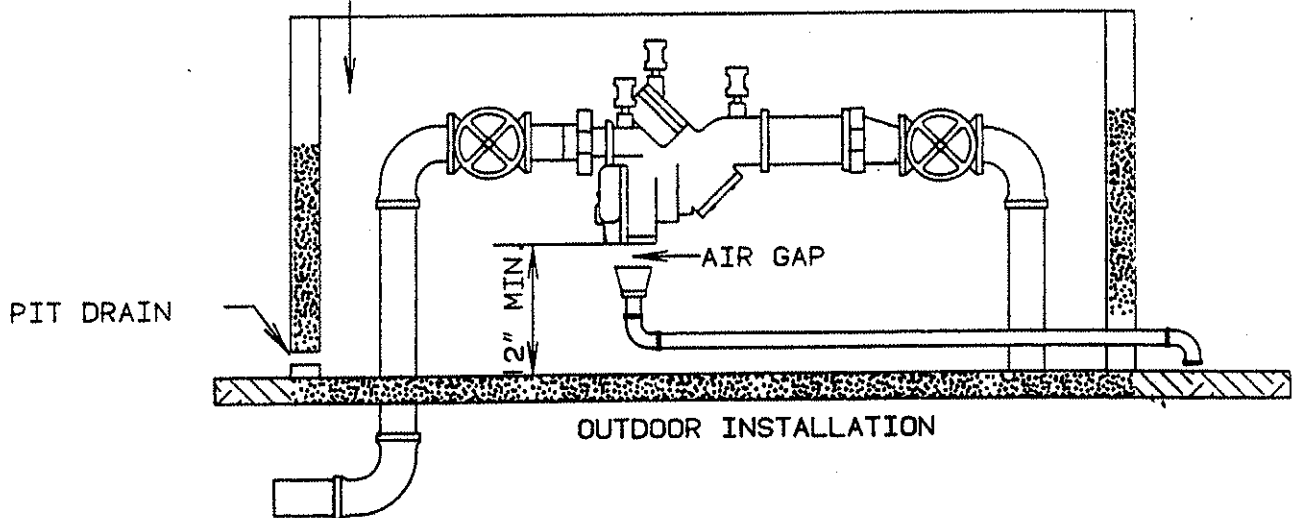
1. Auxiliary Supply - A connection may be made between a public and non-public water supply by using an R.P. device to separate the systems. This must be approved by the water purveyor and the health department. Point of entry protection may also be required.
2. Establishment listed on the Board policy as having to have point of entry protection must have this protection even though they have adequate internal protection.
3. Cooling Tower - It must have an approved R.P. device if an approved air gap is not visible.
4. Chillers and heat exchangers that require more than 10 GPM water supply shall have an approved R.P. device or an approved air gap; units requiring 10 GPM or less may be protected with a double check valve assembly that automatically vents to the atmosphere.
5. All commercial and industrial boilers must have an approved R.P. device or an approved air gap.
6. Existing double check on lawn sprinkler installations shall meet the standards by which they were installed. Also, they must be replaced with R.P. devices when in need of major repair.
7. Any exceptions to Board policy on point of entry protection must be done in writing with reason(s) stated, and approved by appropriate Board members.
8. When an exception is allowed, a letter from the consumer must be on file stating the unprotected lines will not be tapped for any reason without the required permits and a new inspection must be made.
9. New sprinkler or irrigation systems must have an approved R.P. device before first outlet. This device must be installed in accordance with drawing dated 2-2-82 (page 22 in this booklet).



CROSS CONNECTION BOARD MEMPHIS AND SHELBY COUNTY	
APPROVED R-P BACKFLOW PREVENTER INSTALLATION FOR IRRIGATION	
SCALE N.T.S.	DATE: 2-2-82
APPROVED BY <i>Steve Wilson</i>	



FROM WATER METER  
NO CONNECTION PERMITTED  
THIS SIDE OF DEVICE



NOTE: VAULT INSTALLATIONS MUST  
BE INDIVIDUALLY APPROVED

12" MIN. AISLE CLEARANCE REQUIRED @  
ANY POINT. 24" MIN. AISLE CLEARANCE  
REQUIRED ON APPROACH FOR TESTING

CROSS CONNECTION BOARD MEMPHIS AND SHELBY COUNTY	
POINT OF ENTRANCE REDUCED	
PRESSURE BACKFLOW PREVENTOR INSTALLATION	
SCALE N.T.S.	DATE: 2-2-82
APPROVED BY: <i>Stewart</i>	

### Test and Maintenance Report

R P Device Serves Lawn Sprinkling System    Yes <input type="checkbox"/> No <input type="checkbox"/>
--

Customer Address _____	
Mailing Address _____	
Business Name _____	
Responsible Person _____	Phone Number _____

DEVICE _____	MODEL NO. _____	SERIAL NO. _____	SIZE _____	(LOCATION OF DEVICE) _____
Pressure Drop Across No. 1 Check Valve (      PSI)		No. 2 Gate Valve — Leaking ( )    Holding ( )		
Initial Test Date _____	Check Valve No. 1	Check Valve No. 2	Diff. Pressure Relief Valve	
Yes No *Was Device Repaired? <input type="checkbox"/> <input type="checkbox"/> Was Device Replaced? <input type="checkbox"/> <input type="checkbox"/> If Replaced, Old Serial Number _____ Describe Repairs and List Materials Used	Closed Tight ( )	Closed Tight ( )	Opened at _____ PSI	
	Leaking ( )	Leaking ( )	Differential Pressure	
Final Test	Closed Tight ( )	Closed Tight ( )	Opened at _____ PSI	
			Differential Pressure	

New Installation ( ) \_\_\_\_\_ DATE      Annual Test ( ) \_\_\_\_\_ DATE      Plumbing Permitt No. \_\_\_\_\_

**TO BE COMPLETED BY TESTER:** If tests are not performed by a certified tester, results will be considered invalid.  
 Beginning Time \_\_\_\_\_ Ending Time \_\_\_\_\_ Total Time Out of Service \_\_\_\_\_  
 I hereby certify the foregoing information to be correct and an original form is being sent to the consumer for completion.

Firm of Tester _____	Signature of Tester _____	Certificate No. _____	Phone No. _____
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Consumer — Please complete this portion of form and mail to:  

 Cross Connection Representative  
 Memphis Light, Gas and Water Division  
 P.O. Box 430  
 Memphis, TN 38101

I hereby certify this device has been in constant use at this location and was not by-passed, made inoperative or removed without authorization during the previous 12 months. All defects found during the operation period or during tests of the device were satisfactorily corrected.

Signature _____	Title _____	Phone No. _____	Date _____
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#### Completion of Test Form

The unit serial number is required for records to determine performance of individual unit.

The location of device should be precise. You may use the back of the form for diagram.

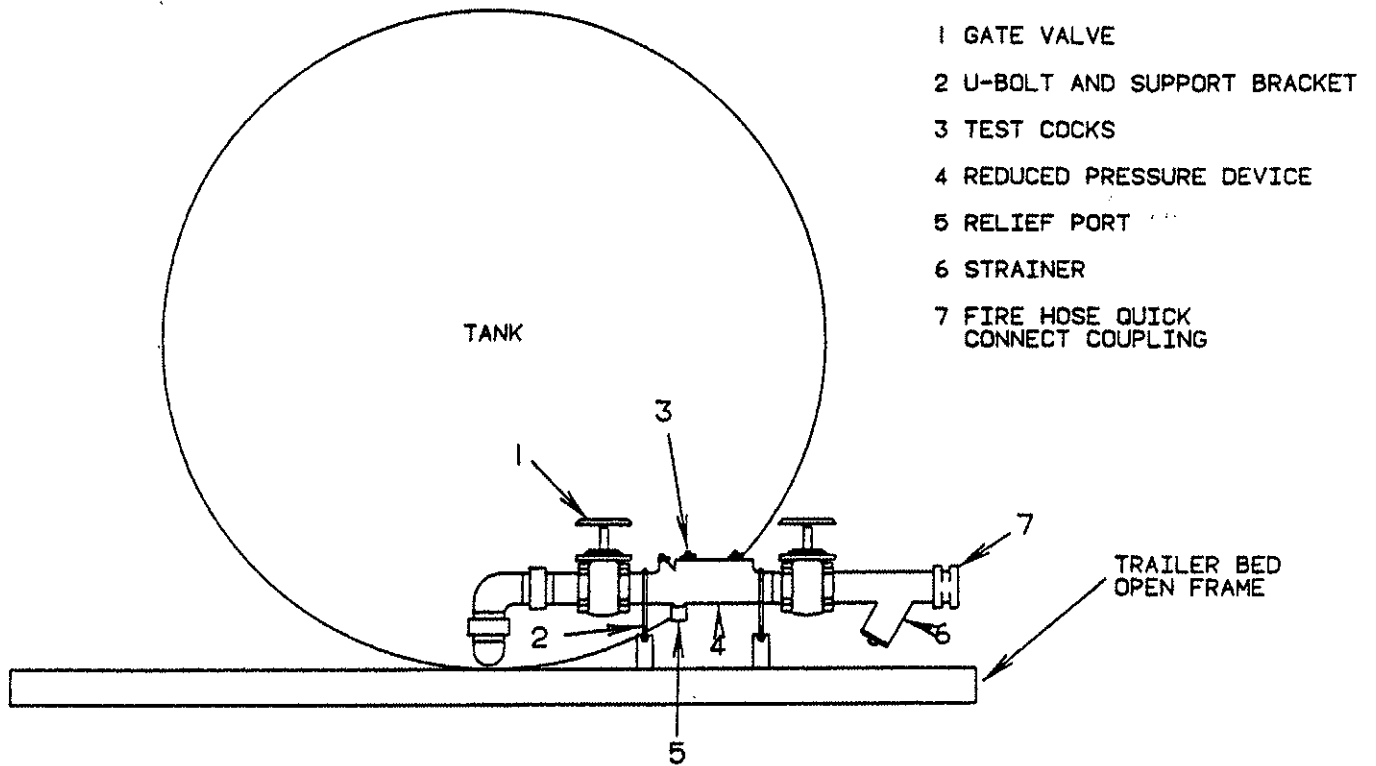
When testing, if abnormal conditions exist, make a notation on form. Record the exact reading on the test kit. Do not round off number. Make sure all spaces on form have been completed and signed by certified tester.

The consumer should not sign the form if there is any question pertaining to the form, he should contact the tester. If the device is being repaired, and there is a delay, please indicate what the problem is on the form; notify water purveyor if more than five days delay.

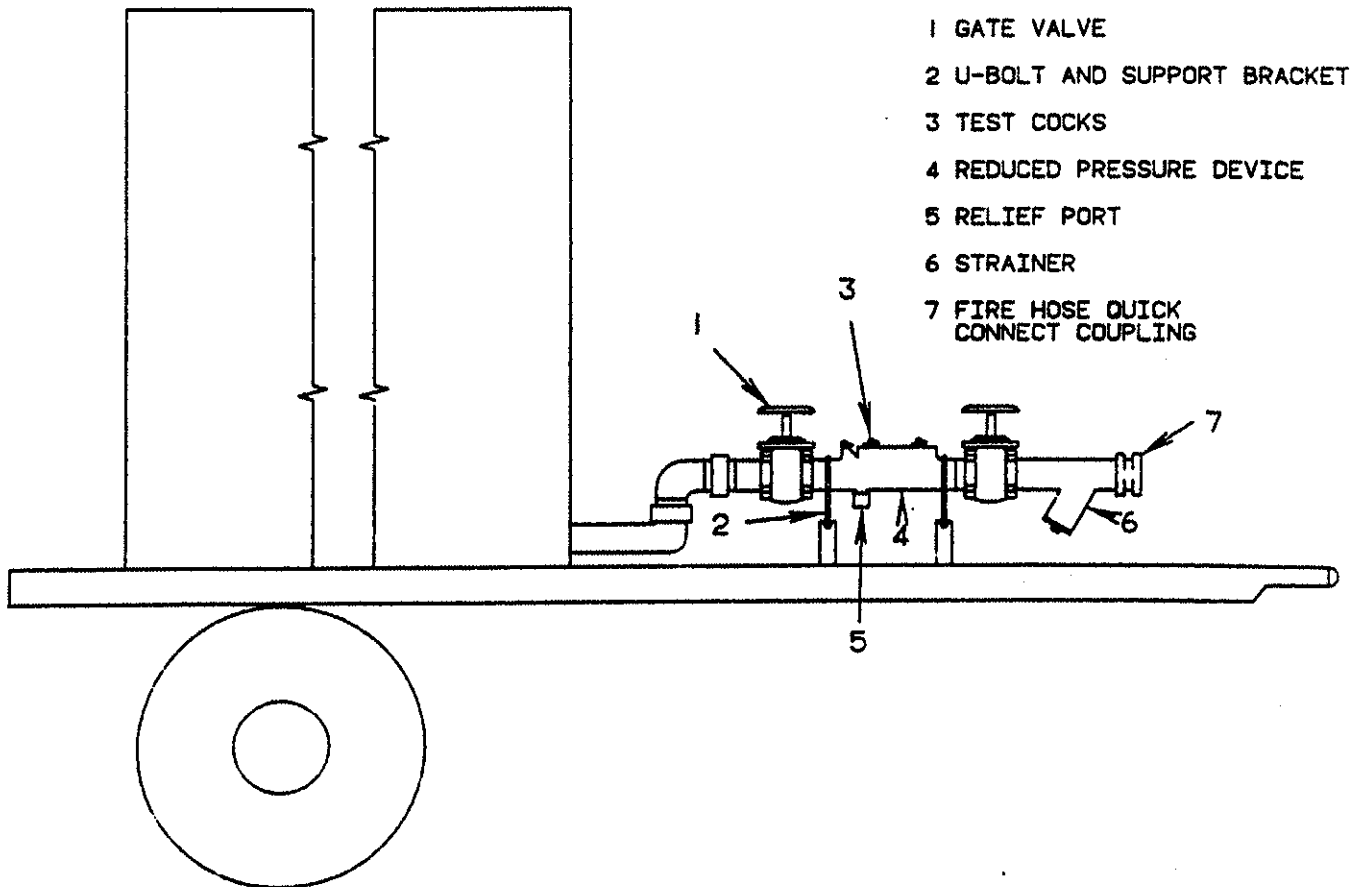
The consumer should be sure to sign the form before mailing to water purveyor.



TYPICAL MOBILE WATER TANK PROTECTION (BOTTOM FILLED TRAILER)



TYPICAL MOBILE WATER TANK PROTECTION (BOTTOM FILLED TRAILER)



# BACKFLOW PROTECTION REQUIREMENTS

## MOBILE TANKS THAT ARE FILLED FROM FIRE HYDRANTS

### TOP FILL

AN APPROVED (FIXED) AIR GAP OR A REDUCED PRESSURE BACKFLOW PREVENTER WITH AN IN-LINE STRAINER BEFORE THIS UNIT.

### BOTTOM FILL

AN APPROVED REDUCED PRESSURE BACKFLOW PREVENTER WITH TIGHT CLOSING GATE VALVES BEFORE AND AFTER THE UNIT WITH AN IN-LINE STRAINER MOUNTED ON THE SUPPLY SIDE OF THE UNIT.

TOP AND BOTTOM FILL TANKS MAY REQUIRE AUXILIARY OPENINGS FOR VENT AND/OR CHEMICAL FILL PORTS IN THE TANK. THESE SHALL BE SO CONSTRUCTED AS TO PREVENT THE INSERTION OF A WATER SUPPLY LINE TO FILL THE TANK.

### TYPICAL MOBILE WATER TANK PROTECTION (TOP FILLED WITH FIXED AIR GAP)

