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Preface

This is a manual of policies and specifications for a Cross-Connection Control Program as Adopted by the City of Melbourne.

This manual of policies and specifications is adopted by ordinance and serves as a guide to insure that the safety of the potable water system is maintained.

The City of Melbourne Water and Sewer Administration:

1. Urges the review of this manual of policies and specifications before designing or installing a backflow prevention device assembly;
2. Believes the material in this manual will provide the consumer with the understanding of cross-connections and backflow prevention devices;
3. Will insure that the policies, standards and specifications as set forth in this manual will be uniformly enforced.
4. Reserves the right to update this manual as necessary due to changes in Florida Department of Environmental Protection policies and regulations and/or American Water Works Association standards.

If there are any questions regarding this manual or policies please call the City of Melbourne Water and Sewer Administration at 727-2900 ext. 216 or 217 between the hours of 8:30 a.m. and 4:00 p.m.

Section 1. Purpose and Intent

The purpose of a Cross-Connection Control Program is:

1.1 Protection

To protect the public potable water supply from the possibility of contamination or pollution by isolating actual and/or potential cross-connections in the water distribution system that could create backflow or back-siphonage into the public potable water supply (Ref: F.A.C. Chapter 17-555.360 or latest edition).

1.2 Elimination of Cross-Connections

To promote the elimination and control of cross-connections (actual or potential) between potable water system(s), non-potable water system(s), and plumbing fixture(s) in existing commercial and/or residential buildings.

1.3 Cross-Connection Control Program

To provide for the maintenance and operation of a continuing program of cross-connection control which will systematically and effectively prevent the contamination or pollution of the City's water distribution system, as required by the Florida Department of Environmental Regulation (Ref: F.A.C. Chapter 17-555.360 or latest edition).

Section 2. Definitions

2.1 *Administrator* shall mean that person designated by the City Manager to administer the city's cross-connection control program, or such person's subordinate.

2.2 *Air-gap separation* shall mean a physical separation between the free flowing discharge end of a potable water supply pipeline and an open or non-pressure receiving vessel. An "approved air-gap separation" shall be at least double the diameter of the supply pipe measured vertically above the overflow rim of the vessel, and in no case less than 1 inch (2.54 cm).

2.3 *Approved* shall reference an air-gap separation, a double check valve assembly, a reduced pressure principle backflow prevention assembly or other backflow prevention assemblies or methods that meet the requirements of Chapter 17-555.360 F.A.C. and is accepted by the administrator.

2.4 *Atmospheric vacuum breaker* shall mean a backflow prevention device that is operated by atmospheric pressure in combination with the force of gravity as defined by Chapter 17-555.360 F.A.C. The unit shall be designed to work on a vertical plane only. The one moving part consists of a poppet valve that must be carefully sized to slide in a guided chamber and effectively shut off the reverse flow of water when a negative pressure exists.

2.5 *Backflow* shall mean the undesirable reversal of water flow or mixtures of water and other liquids, gases or other substances into the distribution pipes of the potable water system from any source or sources as defined by Chapter 17-555.360 F.A.C.

2.6 *Backflow prevention assembly* shall mean an assembly that has been manufactured in full conformance with American Water Works Association (AWWA) Standard C506-69, or later adopted version, and be approved by the administrator. Backflow prevention assemblies must also meet the laboratory and field performance specifications of the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California, or other approved agency and shall also meet the requirements of Chapter 17-555.360 F.A.C.

2.7 *Backflow prevention assembly (type)* shall mean any effective assembly used to prevent backflow into a potable water system. The type of assembly used should be based on the degree of hazard either existing or potential. The types are:

- 2.7.1 Double Check Valve Assembly,
- 2.7.2 Double Detector Check Valve Assembly,
- 2.7.3 Pressure Vacuum Breaker,
- 2.7.4 Reduced Pressure Principle Assembly,

or other devices that meet the requirements of Chapter 17-555.360 F.A.C. and is accepted by the administrator.

2.8 *Backpressure* shall mean any elevation of pressure in the downstream piping system (by pump, elevation of piping, or by steam and/or air pressure) above the supply pressure at the point of consideration that would cause or tend to cause a reversal of the normal direction of flow through the backflow prevention assembly.

2.9 *Backsiphonage* shall mean a form of backflow due to a reduction in system pressure which causes a negative or sub-atmospheric pressure to exist at a site in the water system.

2.10 *Certified backflow prevention device tester* shall mean a person who can prove competency in testing backflow prevention devices to the satisfaction of the administrator (proof will be required). The tester shall have attended and successfully completed an AWWA approved course for Backflow Prevention Device Testers, or a course endorsed by the AWWA.

2.11 *Check valve* shall mean a valve that is drip-tight in the normal direction of flow when the inlet pressure is at least one (1) pound per square inch (psi) and the outlet pressure is zero (0) psi. The check valve shall permit no leakage in a direction reverse to the normal flow. The closure element (e.g. clapper, poppet or other design) shall be internally loaded to promote rapid and positive closure. An approved check valve is only one component of an approved backflow prevention assembly, i.e., pressure vacuum breaker, double check valve assembly or reduced pressure principle assembly.

2.12 *Consumer* shall mean the owner or operator of a private plumbing and/or water system who receives water from the City of Melbourne potable water system.

2.13 *Contamination* shall mean an impairment of the water quality that creates an actual hazard to the public health through poisoning or through the spread of disease or illness by sewage, industrial fluids, or any other means.

2.14 *Cross-connection* shall mean any unprotected connection or structural arrangement between the public potable water system and any other system or source where it is possible to introduce into any part of the potable water system any used water, industrial fluid, gas, or other substance. Any connection or device that can create the potential for a backflow condition is considered a cross-connection including bypass arrangements, jumper connections, removable sections, swivel or change-over devices and other similar devices whether temporary or permanent.

2.15 *Cross-connection control* shall mean control of connections between the potable water system and another

potable or non-potable plumbing and/or water system by proper installation of an approved backflow prevention device that will continuously protect the potable water system.

2.16 *Double check valve assembly* shall mean an assembly composed of two independently acting, approved check valves, including tightly closing shut-off valves located at each end of the assembly and suitable connections for testing the water tightness of each check valve. A check valve is a valve that is drip tight in the normal direction of flow when the inlet pressure is one psi and the outlet pressure is zero. The check valve shall permit no leakage in a direction reverse to normal flow. The closure element (e.g., clapper) shall be internally weighted or otherwise internally loaded to promote rapid and positive closure.

2.17 *Double detector check valve assembly* shall mean a specially designed assembly composed of an approved double check valve assembly with a specific bypass water meter and an **approved double check valve assembly all properly sized**. The meter shall register accurately for low flow rates and shall total all flows. This assembly shall be permitted on fire lines only to protect against a non-health hazard (pollutant).

2.18 *Hazard (degree)* shall be derived from the evaluation of conditions within a system which can be classified as either a "pollutional" (non-health) or a "contamination" (health) hazard.

2.19 *Hazard (health)* shall mean an actual or potential threat of contamination to the public potable water system or the consumer's potable plumbing and/or water system.

2.20 *Hazard (plumbing)* shall mean an internal cross-connection in a consumer's potable water system that may be either a pollutional or a contamination type hazard. This includes but is not limited to cross-connections with toilets, sinks, lavatories, washtrays, domestic washing machines and lawn sprinkling systems. Plumbing type cross-connections can be located in homes, apartment houses, hotels, commercial and industrial establishments, and other structures. All structures must be properly protected by an appropriate type of cross-connection prevention device assembly.

2.21 *Hazard (pollutional)* shall mean an actual or potential threat to the physical properties of the potable water system or the potability of the public or the consumer's potable water system, but not constituting a health system hazard. This type of hazard results in the degradation of the potable water system to levels that can be aesthetically objectionable or could cause minor damage to the system or its appurtenances.

2.22 *Industrial fluids* shall mean any fluid or solution which may physically, chemically, biologically or otherwise contaminate or pollute potable water if introduced into the potable water system or consumer plumbing system or potable water system. Industrial fluids may include, but not be limited to polluted or contaminated water; all types of process waters and "used waters" originating from the public potable water system which may deteriorate in sanitary quality; chemicals in fluid form; plating acids and alkalies; circulated cooling water connected to an open cooling tower and/or cooling waters that are chemically or biologically treated or stabilized with toxic substances; contaminated natural waters such as from wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, etc.; oil, gases, glycerine, paraffins, caustic and acid solutions; and other liquid and gaseous fluids used in commercial/industrial type processes or for fire fighting purposes.

2.23 *Industrial piping system (consumer's)* shall mean any system used by the consumer for transmission, confinement or storage of any liquid, solid or gaseous substance other than an approved potable water supply. An industrial piping system includes all pipes, conduits, tanks, receptacles, fixtures, equipment and appurtenances used to produce, convey or store substances that can pollute or contaminate potable water.

2.24 *Laboratory (approved for testing)* shall mean the foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California or other testing laboratory approved by the administrator.

2.25 *Pollution* shall mean an impairment of the quality of potable water to a degree that does not create a hazard to public health, but does adversely and unreasonably affect the aesthetic qualities of such waters for domestic use.

2.26 *Pressure vacuum breaker* shall mean an assembly containing an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly is to be equipped with properly located test cocks and tightly closing shut-off valves attached at each end of the assembly. This assembly shall be designed to protect against a health hazard (contaminant) under a backsiphonage condition only. A pressure vacuum breaker is similar to an atmospheric vacuum breaker except that the checking unit "poppet valve" is activated by a spring. This type of vacuum breaker does not require a negative pressure to react and can be used on the pressure side of a valve.

2.27 *Reclaimed water (reuse)* shall mean treated and disinfected effluent from a wastewater treatment plant used

for irrigation, dust control, fire protection, and all other purposes permitted by Florida Administrative Code.

2.28 *Reduced pressure principle backflow prevention assembly* shall include within its structure a minimum of two independently acting approved check valves, together with an automatically operating, pressure differential relief valve located between the two check valves as defined by Chapter 17-555.360 F.A.C. The first check valve reduces the supply pressure a predetermined amount so that during normal flow and at cessation of normal flow the pressure between the checks shall be less than the supply pressure. In case of leakage of either check valve, the differential relief valve, by discharging to atmosphere, shall operate to maintain the pressure between the checks less than the supply pressure. The unit shall include tightly closing shut-off valves located at each end of the device, and each device shall be fitted with properly located test cocks.

2.29 *Service connection* shall mean the terminal end of a service connection from the public potable water system, i.e., where the water purveyor may lose jurisdiction and sanitary control over the water at its point of delivery to the consumer's water system. If a meter is installed at the end of the service connection, then the service connection shall mean the downstream end of the meter.

2.30 *Water (potable)* shall mean any water which according to recognized standards is safe for human consumption.

2.31 *Water purveyor* shall mean the public or private owner or operator of the potable water system supplying an approved water supply to the public.

2.32 *Water supply (approved)* shall mean any public potable water supply that has been investigated and approved by the State of Florida Department of Environmental Regulation. The system must be operating under a valid permit.

2.33 *Water supply (auxiliary)* shall mean any water supply available to the premises other than the purveyor's approved public potable water supply. Auxiliary water supplies include water from another purveyor's potable water supply; other water sources such as a well, spring, river, stream, harbor, etc.; reclaimed wastewater (reuse); industrial fluids; or any other type of water supply not controlled by the primary water purveyor.

2.34 *Water supply (unapproved)* shall mean a water supply that has not been approved for human consumption by the State of Florida Department of Environmental Regulation and/or is not operating under a valid permit.

2.35 *Water system(s) (consumer's)* shall include any plumbing and/or water system located on the consumer's premises whether supplied by a public potable water system or an auxiliary water supply. The system or systems may be either a potable water system or an industrial piping system.

2.36 *Water system(s) (consumer's potable)* shall mean that portion of a privately owned potable plumbing and/or water system between the point of potable water delivery by the water purveyor and the consumer's point of use. This system will include all pipes, conduits, tanks, receptacles, fixtures, equipment and appurtenances used to produce, convey, store or use the potable water.

2.37 *Water system (public)* shall mean the City of Melbourne Public Water System operated as a public utility under a valid permit from the State of Florida Department of Environmental Regulation and other applicable regulatory agencies to supply potable water for domestic purposes. This system will include all sources, facilities and appurtenances between the source and the point of delivery such as valves, pumps, pipes, conduits, tanks, receptacles, fixtures, equipment and appurtenances used to produce, convey, treat or store potable water for public consumption or use.

Section 3. Authority

The following authorities are justification for establishing a cross-connection control program.

3.1 Safe Drinking Water Act

The Safe Drinking Water Act (PL 93-523) was signed into law by Congress on December 16, 1974. The purpose of the law is to assure that the nation's potable water supply systems meet minimum National Health Standards for the protection of public health.

In accordance with the Safe Drinking Water Act, the National Interim Primary Drinking Water Regulations were promulgated on December 24, 1975 and became effective on June 24, 1977. These regulations replaced the Public Health Service Drinking Water Standards of 1962. It is stated in Appendix A of the rule that "minimum protection should include programs that result in...prevention of health hazards, such a cross-connections."

The Safe Drinking Water Act and its regulations cover all public potable water systems with 15 or more service connections and systems that regularly serves 25 individuals. Under Section 1413 of the Safe Drinking Water Act, states may obtain primary enforcement responsibilities for their water quality program. However, the state's regulations must be equal to or exceed the federal regulations. The administrator of the Environmental Protection Agency retains authority over states that do not obtain primacy.

3.2 Florida Regulations

The State of Florida was granted primacy over the water program under the authority of the "Florida Safe Drinking Water Act" Chapter 403.850-403.864 Florida Statutes. In January of 1975, the State of Florida adopted Florida Administrative Code (F.A.C.) Chapter 17-22 (Public Drinking Water Systems), and the regulations went into effect in November of 1977. The Florida regulations were revised in November of 1987 to address the topic of cross-connection control and backflow prevention and incorporated more specific language than that contained in the federal regulations. The Florida regulations (Chapter 17-22, F.A.C.) were revised again, and renumbered in January of 1989 as Florida Administrative Codes 17-550, 17-555, and 17-560.

Rule 17-550.200(10) F.A.C. defines a cross-connection as "any physical arrangement whereby a public water supply is connected directly or indirectly with any other water supply system, sewer drain, conduit, pool, storage reservoir, plumbing fixture, or other device which contains or may contain contaminated water, sewage or other waste or liquid of

unknown or unsafe quality which may be capable of imparting contamination to the public water supply as the result of backflow. By-pass arrangements, jumper connections, removable sections, swivel or changeable devices and other temporary or permanent devices through which or because of which backflow could occur are considered to be cross-connections."

Rule 17-555.360(1) F.A.C. states, "Cross-connection as defined in Rule 17-550.200 F.A.C. is prohibited."

Rule 17-555.360(2) states, "Community water systems shall establish a routine cross-connection control program to detect and prevent cross-connections that create or may create an imminent and substantial danger to the public health..."

The water purveyor is given the authority and responsibility to discontinue service to any customer who refuses installation of a backflow preventer where an actual and/or a potential cross-connection may exist (Chapter 17-555.360(3)). The authority to control and supervise the installation of approved backflow prevention devices rests with the "supplier of water or his designated representative..." (Chapter 17-555.360(4)).

3.3 Local Enforcement

As the water purveyor, the City of Melbourne has developed a Cross-Connection Control Program based on the guidelines in Chapter 17-555.360 F.A.C. Currently, this program has additional system wide enforcement for new development under the *Melbourne Water and Sewer Administration Technical Specifications for Construction of Water Distribution Systems* (Section 11, Cross-Connection Control). There is an additional means of local enforcement within the Melbourne City limits under City Ordinance 89-31, Chapter 8.201 (adoption of the Standard Plumbing Code).

3.4 Accepted Practices

Such a program shall be developed utilizing accepted practices of the American Water Works Association guidelines as set forth in AWWA Manual M 14, "Backflow Prevention and Cross-Connection Control" (Reference FDER 17-555.360 or latest edition) and the USC Cross-Connection Manual (latest edition).

3.5 Objectives

Backflow may result in the potable water system becoming a transmitter of diseases, and/or toxic materials and/or other hazardous liquids. Therefore, it is necessary to establish and maintain a cross-connection control program to protect the health of the City of Melbourne water system customers and/or users of the potable water system by the control of actual or potential cross-connections through methods of containment and/or isolation.

Section 4. Records and Enforcement

4.1 Responsibility

The City of Melbourne is responsible for the protection of the potable water distribution system from contamination or pollution due to the backflow of contaminants or pollutants through any and all water service connections. It shall be the judgement of the administrator to require an approved backflow prevention device installation at the water service connection to any consumer's premises. The administrator shall give notice in writing to the customer, that an approved backflow prevention device is to be installed in accordance with the specifications contained herein.

The administrator will designate the location of all backflow prevention devices. Failure, refusal, or inability on the part of the consumer to install a backflow device shall constitute grounds for refusal of water or fire service or the discontinuance of water or fire service to the premises until such a device or devices have been properly installed.

4.2 Records

Records concerning installation and testing shall be kept on-site and accessible for a period not less than ten (10) years. The administrator shall be permitted reasonable access to these records as required for the purpose of monitoring compliance with city codes and ordinances.

4.3 Violations

Submission by any person of any false statement or misrepresentation in any application, record, report, plan, or other document required by this policy shall constitute a violation of the conditions for water service. Any person who has not complied with federal, state and local laws or ordinances regarding cross-connection control shall be considered in violation of the conditions for water service. Any person not complying with the policies and guidelines within the City of Melbourne Cross-Connection Control Manual shall be considered in violation of the conditions for water service.

4.4 Written Notice

The administrator shall issue a written notice that an approved backflow prevention device is required at a consumer's water connection. Upon receipt of such written notice the consumer shall immediately install such an approved backflow prevention device at the sole expense of the customer.

4.5 Enforcement Policy

No water service connection to any premises shall be installed or maintained by the City of Melbourne unless the water supply

is protected as required by federal, state and local laws and ordinances and this adopted manual.

Water service to a consumer shall be discontinued by the administrator if a backflow prevention device required by this manual is not installed, tested, and maintained, or if it is found that a backflow prevention device has been removed, bypassed, or an unprotected cross-connection exists on the premises. Service shall not be restored until such conditions, or defects are corrected at the consumer's expense.

4.6 Inspections

The consumer's system shall be open for inspection at all reasonable times to the administrator to determine whether actual or potential cross-connections exist. When an actual and/or potential cross-connection condition becomes known, the administrator shall deny or immediately discontinue service to the premises by providing a physical break in the service line until the consumer has corrected the hazardous conditions.

Any cost in the disconnection or reconnection of the water service will be paid by the consumer.

4.7 Installation

The administrator shall designate the installation location of an approved backflow prevention device. Reference the installation guidelines section and the standard drawings.

4.8 Auxiliary Water Supply

The public water system shall be protected against backflow and backsiphonage by the installation of an approved backflow prevention device if an auxiliary water supply is found on the consumer's premises that may or may not be safe in bacteriological or chemical quality.

4.9 Industrial Fluids

If any industrial fluids or any other objectionable substances are handled in such a fashion as to create an actual or potential hazard to the public water system, the public water system shall be protected against backflow and backsiphonage. This protection shall include the installation of the backflow prevention device in the service line. The type of backflow prevention device installed shall be appropriate for the potential degree of hazard.

4.10 Internal Cross-Connections

If an internal cross-connection(s) or undefined plumbing arrangement exists or if entry to all portions of the premises is not readily accessible for inspection purposes, the public water system shall be protected against backflow and

backsiphonage by the installation of a backflow prevention device in the service line.