

LEE COUNTY BOARD OF COUNTY COMMISSIONERS

AGENDA ITEM SUMMARY

BLUE SHEET NO: 20030829-UTL

1. REQUESTED MOTION:

ACTION REQUESTED:

Board approval by Resolution to amend and completely replace Sections 5, 9, and 12 of the Lee County Utilities Operations Manual and establish an effective date upon adoption.

WHY ACTION IS NECESSARY:

To update the County's Cross Connection Control Policy.

WHAT ACTION ACCOMPLISHES:

Incorporates and implements new Cross Connection Control procedures, design, and product technology.

2. DEPARTMENTAL CATEGORY: 10 - UTILITIES
COMMISSION DISTRICT #: C100

3. MEETING DATE: 08-05-2003

4. AGENDA:

- CONSENT
- ADMINISTRATIVE
- APPEALS
- PUBLIC
- TIME REQUIRED: _____

5. REQUIREMENT/PURPOSE:

- (Specify)
- STATUTE
 - ORDINANCE
 - ADMIN. CODE
 - OTHER Revision of Manual

6. REQUESTOR OF INFORMATION:

- A. COMMISSIONER: _____
- B. DEPARTMENT: Public Works
- C. DIVISION/SECTION: Utilities/Admin
- BY: Rick Diaz, PE, Utilities Director
- DATE: 7/16/03

7. BACKGROUND:

On September 25, 1979, the Board of County Commissioners adopted the Utilities Administrative Manual (now known as the Utilities Operations Manual), which established the standards and specifications for the County's water and sanitary sewer facilities. Subsequent modifications were adopted in 1990, 1991, 1992, 1995, 1996, 1999, 2000 and 2002.

The following three Sections have multiple changes and completely replace the 2/22/00 edition of these Sections of the Manual:

- Section 5. WATER SYSTEMS - Deletes the existing cross connection control policy subsection.
- Section 9. STANDARD DETAILS - Adds 2 new details and updates existing details relating to cross connection control.

(CONT'D.)

8. MANAGEMENT RECOMMENDATIONS:

9. RECOMMENDED APPROVAL

DEPARTMENT DIRECTOR	PURCHASING	HUMAN RES.	County Administration				OTHER	COUNTY ATTORNEY	COUNTY MANAGER
			OA	OM	Risk	GC			
<i>Jim Lavender</i> DATE: 7.17.03	N/A	N/A	<i>P. Mullis</i> 7/21/03	<i>Jim</i> 7/22	<i>or</i> 7/21/03	<i>K8</i> 7/21/03	<i>M</i> M. Crumpton DATE: 7/15/03	<i>Jim Lavender</i> Date: 7.17.03	

10. COMMISSION ACTION:

- APPROVED
- DENIED
- DEFERRED
- OTHER

RECEIVED BY
COUNTY ADMIN: *MM*
7-21-03
9:45
COUNTY ADMIN
FORWARDED TO:
7/28/03

REC'D.
by CO. ATTY.
7/17/03
4:15 PM
CO. ATTY.
FORWARDED TO:
By Admin

Section 12. CROSS CONNECTION CONTROL POLICY- Deletes the existing Section 12 that contains metric conversion units and becomes the new location of the Cross-Connection Control Policy. Though the Revised Policy utilizes most of the Existing Policy, it should be considered a completely new document that includes the clarification of who must utilize cross connection control and to what level of protection, updating the maximum rebate schedule and reducing the compliance time from 1 year to 180 calendar days for existing customer retrofits, the establishment of record keeping requirements, the establishment of enforcement procedures for non-compliance by certified testers and repairers, and the establishment of a maximum onsite design water pressure of 30 p.s.i. for all proposed developments requiring the installation of a cross connection control assembly.

Comments were requested from the SWF Utility Contractors Association, the Lee County District Fire Chiefs Association, and the Building Industry Association of SWF on May 29, 2003. To date, no comments have been received since the submittal deadline of June 16, 2003.

No funds required.

Attachments: Resolution
Exhibit A - Section 5. Water Systems
Exhibit B - Section 9. Standard Details
Exhibit C - Section 12. Cross Connection Control Policy



LEE COUNTY RESOLUTION NO. _____

A Resolution of the Board of Lee County Commissioners Adopting
Updated and Revised Sections of the Lee County Utilities Operations Manual
Regarding the County's Cross Connection Control Program and Policy

WHEREAS, the Board of County Commissioners ("Board") is the governing body in and for Lee County, Florida, and

WHEREAS, pursuant to Chapter 125, Florida Statutes, the Board is the regulatory authority for the Lee County Utilities System, and

WHEREAS, the Board adopted the Lee County Utilities Operations Manual ("Manual") by Resolution 79-9-18 that governs the administration, design, and construction of the water, wastewater, and reclaimed water functions within Lee County Utilities System service area, and

WHEREAS, the original Manual has been amended by Resolutions 90-01-45, 91-07-96, 92-12-82, 96-06-36, 96-11-15, 99-04-02, and 00-02-62, and

WHEREAS, the Board adopted Ordinance 95-21 entitled "Potable Water Cross Connection Control Program" ("Program"), and

WHEREAS, the Lee County Utilities Division developed a Cross Connection Control Policy ("Policy") in accordance with Ordinance 95-21 and incorporated said Policy into the Manual by Resolution on October 18, 95, and

WHEREAS, the Lee County Utilities Division has prepared updated and revised Sections of the Manual that govern the County's Program and Policy, and

WHEREAS, it is now the desire of the Board to adopt by reference hereto, the revised Manual and to require immediate compliance therewith for all future administration, design, and construction of water, wastewater, and reclaimed water facilities within the Lee County Utilities System service area, and

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF LEE COUNTY COMMISSIONERS that:

- 1) All portions of Lee County Resolutions which adopt and amend portions of the Lee County Utilities Operations Manual with regard to the County's Cross Connection Control Program and Policy, are hereby repealed,
- 2) The updated and revised Lee County Utilities Operations Manual including the revised and updated cross connection control program and policy, copies of which are on file in the offices of the Lee County Clerk and the Director of the Lee County Utilities Division, is hereby adopted,

- 3) The updated and revised Lee County Utilities Operations Manual shall apply to the administration, design, and construction of new, existing, and the expansion/modification of all water, wastewater, and reclaimed water facilities under the jurisdiction of the Board of County Commissioners, Lee County, Florida, and,
- 4) That this Resolution shall take effect immediately upon its adoption.

THE FOREGOING RESOLUTION was offered by Commissioner _____, who moved its adoption. The Motion was seconded by Commissioner _____, and, upon being put to a vote, the vote was as follows:

- Commissioner: Bob Janes _____
- Commissioner: Doug St. Cerny _____
- Commissioner: Ray Judah _____
- Commissioner: Andy Coy _____
- Commissioner: John Albion _____

DULY PASSED AND ADOPTED this _____ day of _____, 2003

ATTEST:
CHARLIE GREEN, CLERK

BOARD OF COUNTY COMMISSIONERS
OF LEE COUNTY, FLORIDA

BY: _____
DEPUTY CLERK

BY: _____
CHAIRMAN

APPROVED AS TO FORM

OFFICE OF THE COUNTY ATTORNEY

SECTION 5 WATER SYSTEMS

5.1 GENERAL

This section sets forth the general requirements for design, installation and testing of water distribution systems for potable service. Additional information can be found in Section 4 (General Conditions), Section 9 (Standard Drawings), and Section 10 (Standard Plan Notes) and Section 13 (Technical Specifications). Lee County Utilities does not guarantee flow, fire flows, nor pressure.

5.2 SYSTEM DESIGN

The Engineer shall comply with the design and installation requirements as specified by Lee County Utilities, the Florida Department of Environmental Protection, the Florida Department of Health, Lee County Department of Transportation, Florida Department of Transportation and any other relevant state and local regulatory agencies.

A. Flow Demands

Flow demands for design shall be calculated on the basis of full development as known or projected. The average daily flow for domestic use shall be calculated at the minimum rate as follows:

- Single-Family (SF) Residence = 100 gpd per capita, 2.5 persons per residence for a flow of 250 gpd per SF residence.
- Multi-Family (MF) Residence = 100 gpd per capita, 2.0 persons per residence for a flow of 200 gpd per MF residence.
- Mobile Home Park (MHP) Unit = 100 gpd per capita, 2.0 persons per unit for a flow of 200 gpd per MHP unit.
- RV Unit = 50 gpd per capita, 2 persons per unit; for a flow of 100) gpd per RV unit.
- Flow demands for commercial, industrial, and special-type developments shall be established from Florida Administrative Code FAC 64E-6 guidelines, existing records of the last year maximum three-month average, or by using the best available data.

A minimum peak day factor shall be 2.5 times the average daily value. An equivalent Residential Unit (ERU) is defined as 250 gpd.

B. System Size Computation

The minimum design for water distribution systems shall provide for at least 100% of the combined average day demand rate times the peak factor at 2.5 plus the required fire flow. The allowable minimum service pressure under such design conditions shall be 20 psi. Design computations shall be by the Hardy-Cross procedure, if done manually, or through the use of H2O NET Version 2.5, or other Lee County Utility approved model, if done by computer. H2O NET Version 2.5 shall be the preferred method in all cases with Hardy-Cross only being accepted for small system analysis. All design data and computer printouts or data disks shall be

subject to review and approval by Lee County Utilities. All water mains shall be sufficiently looped and in no case shall water mains be less than 8" in diameter unless specifically approved by Lee County Utilities.

Minimum Water Main Size.

- One and two dwelling unit developments shall be no less than 8" in diameter.
- Multifamily developments with three to six dwelling units per building shall be no less than 8" in diameter.
- Multifamily developments composed of buildings with more than six dwelling units per building and not exceeding three stories in height shall be no less than 8" in diameter.
- Multifamily developments composed of buildings with more than six units per building or more than two stories in height shall be no less than 10" in diameter.
- All commercial developments shall be no less than 10" in diameter.
- All industrial developments and all hazardous storage areas shall be no less than 12" in diameter.
- Unless specifically approved by Lee County Utilities for all dead end water mains 6" in diameter and larger a fire hydrant and fully restrained valve must be provided at the end of the main in lieu of a blow-off assembly.

C. Fire Flows

Fire protection and public water systems shall be independent systems, designed by a Florida Registered, Professional Engineer and constructed in accordance with county, state, and federal standards, including satisfaction of the domestic requirements established by the appropriate state agency and the fire protection requirements established by the Uniform Fire Code and the Lee County Land Development Code as amended from time to time.

D. Connection to Existing System

All connections to existing mains shall be made as authorized by the Owners of the existing system. Valves separating the mains being installed from existing mains shall be operated by or under the direction of Lee County Utilities. The cost of the work in making the connections shall be paid for by the Contractor. A representative of Lee County Utilities must be present at all tie-ins and wet taps.

In the event the proposed main is to be connected to a main which has one or more active services between the point of connection and the first existing line valve, a temporary plug or cap shall be installed on the new main until the pressure tests and disinfecting are complete. Upon satisfactory completion, the cap or plug shall be removed from both mains and the connection made with pipe, which has been swabbed out with a minimum of 50-PPM chlorine solution. The connection shall be made as swiftly as possible and any water in the ditch shall be kept below the level of the pipe.

In the event any existing customers will be without water while a connection is being made; the

Contractor shall notify them 72 hours in advance of when the water will be turned off and when he estimates service will be resumed. These connections shall be made at night unless an alternate tie-in time is approved by Lee County Utilities. No customer shall be without water service for more than 4 hours unless specifically approved by Lee County Utilities.

E. Tapping Sleeves

Tapping sleeves used to make "wet" taps into existing mains shall be rated for 150 psi working pressure and shall be constructed entirely of stainless steel; and shall be installed with stainless steel bolts. The Contractor shall determine the outside diameter and type of the existing main before ordering the sleeve. Size on size taps will only be allowed when connecting to C900 DR 18, C900 DR 14, and all ductile iron pipes. When other types of pipelines are encountered, the proposed tap shall be at least 2 diameter inches smaller than the diameter of the existing pipeline.

F. Fire Hydrants

Fire hydrants serving one or more buildings located on private property and or behind a fence or other barrier in which 24 hour access is not provided, Lee County Utilities may require the installation of a double detector check valve assembly to be located at the right of way line. The fire hydrant(s), water main and all related appurtenances located behind the first O.S. & Y. valve of the double detector check valve assembly will be considered private. It shall be the responsibility of the property owner to adequately maintain all private facilities.

In all cases fire hydrants shall be installed so that the 4 ½" streamer connection is no less than 18" and no more than 24" above finished grade.

Fire hydrants shall be spaced as follows:

- Hydrants for one to two dwelling unit developments shall be 800 feet apart as measured along the centerline of the street.
- Hydrants for multi-family developments with three to six dwelling units per building and not exceeding two stories in height shall be 600 feet apart measured along the centerline of the street.
- Hydrants for multi-family developments with more than six dwelling units per building or more than two stories in height shall be 400 feet apart as measured along the centerline of the street.
- Hydrants for commercial developments shall be 400 feet apart as measured along the centerline of the street.
- Hydrants for all industrial and hazardous storage areas, as defined in the Standard Building Code, shall be 300 feet apart as measured along the centerline of the street.

Hydrant barrels shall be painted AWWA Safety Yellow. They shall be designed for a working pressure of 150 psi and will conform to AWWA Standard C502, "Fire Hydrants for Ordinary Water Works Service."

Acceptable brands of fire hydrants are:

- Muller Centurion A-423
- Kennedy K-81A
- American Darling LCU B84B
- Clow Medallion
- U.S. Pipe Metropolitan 250 Model 94.

Refer to Section 9 for additional fire hydrant detail.

G. Hydrants (See Technical Specifications)

H. Hydrant Guard Posts/Bollards

The location of guard posts/bollards for hydrants shall be required in areas subject to traffic flow and maneuvering and approved by Lee County Utilities and the Engineer of Record. Guard posts/bollard shall be constructed of 6" diameter, Class 50, Ductile Iron Pipe 6' long buried, 3' below finished grade, filled with 2500 PSI concrete and painted AWWA safety yellow, (refer to detail in Section 9).

I. Valves and Valve Locations

Fully restrained, resilient seated gate valves shall be utilized on all water mains. For water main valves 20" or larger, a 4" valved bypass line shall be installed at all valves if deemed necessary by Lee County Utilities.

Valves shall be provided at pipe terminations, all intersecting water mains, fire hydrants, on both sides of all canal crossings, and all other locations necessary to provide an operable, easily maintained and repaired water distribution system. Maximum length of water main between valves which can be used for shutting down the line for repair work, shall not exceed 500 feet in commercial and industrial areas. The maximum length of pipe shutdown between valves, which can be used for shutdown for repair work in residential areas, shall not exceed 1,000 feet. All valves shall be tied by stationing for easy identification by field personnel.

Fire hydrants shall be installed with a valve at the connection to the main line. If the pipeline run for the fire hydrant, (fire lines), exceeds 100', a second fully restrained valve shall be required within 5' of the hydrant base.

J. Pipe Depth

The standard minimum cover for water distribution systems shall be 30" from the top of pipe to finished grade. Should this design not be possible, alternate methods must be submitted to and approved by Lee County Utilities. Where possible, maximum cover for water mains shall not exceed 48".

K. Air Venting

Where the water main profile is such that air pockets or entrapment occur which could result in flow blockage, automatic air release valves shall be provided. Air venting capabilities shall be provided for distribution mains by appropriately placing fire hydrants or utilizing the blow-off detail shown in Section 9. At critical points on major mains automatic air release assemblies shall be installed. All dead-end water mains, whether temporary or permanent, shall be equipped with a manually operated blow-off assembly at the terminal end.

L. Joint Restraining

Pressure pipe fittings and other appurtenances requiring restraint shall install joint restraint devices, manufactured restrained joint pipe and fittings or, if approved by Lee County Utilities be braced with thrust blocks. Joint restraining systems shall be designed for the maximum pressure condition and the safe bearing load for horizontal and vertical thrust. At a minimum, the thrust restraining system shall have a working pressure equal to or greater than the pipe material maximum pressure rating. The Design Engineer in specifying all restraining devices shall determine a reasonable safety factor. All restrained fittings and joints shall be shown on the plan and profile and must be included on the record drawings. Refer to Section 9 for the minimum restraint schedule required by Lee County Utilities.

A joint restraining schedule shall be the responsibility of the Design Engineer and shall be included in the design package. The restraining schedule shall be an integral part of the package submitted for approval by Lee County Utilities and the permit agencies.

M. Electrolysis Prevention

All systems shall be designed to best avoid electrolytic action through the contact of dissimilar metals. Preventative action, if required, may consist of installing insulating or dielectric couplings between the two materials.

N. Dead End Lines

Dead end lines will not be allowed unless justified by the Engineer and specifically approved by Lee County Utilities.

O. Water Main Location

Water main extensions are to conform to the existing water main design layout. Water mains are to be installed on the same side of the road as the existing main unless otherwise approved by Lee County Utilities.

5.3 MATERIALS

A. Pipe

1. Ductile Iron Pipe

All water mains larger than 12" shall be constructed of Ductile Iron Pipe and shall be used for all vertical deflections ditch crossings, subaqueous crossings, and all paved surfaces unless otherwise approved by Lee County Utilities.

Ductile Iron Pipe shall be a minimum of Class 50 or pressure Class 250 and will be accepted in any diameter for use within the distribution system. Ductile Iron Pipe shall conform to the requirements of ANSI/AWWA C151, and shall be cement lined and conform to the requirements of ANSI Standard C104. Fittings for Ductile Iron Pipe shall conform to the requirements of ANSI/AWWA C153/A21.53 or ANSI/AWWA C110/A21.10. Mechanical and push-on joints shall conform to ANSI/AWWA C111/A21.11 and flanged joints shall conform to ANSI/AWWA 115/a21.51.

All aboveground pipe shall be painted blue. The pipe wall thickness shall not be less than that required by a working pressure of 250 psi in laying condition Type 4 "B" with 5-foot cover in conformance with ANSI Standard A21.50.

Gaskets shall be a Buna N, Neoprene, or a Nitril-based rubber product approved by the County. Gaskets shall have clean tips unless otherwise specified. Elastomeric gaskets conforming to ASTM F-477 shall also be acceptable.

2. Polyvinyl Chloride Pipe (PVC)

Unless otherwise specified and approved by Lee County Utilities, all 4" through 12" diameter PVC pipe shall be rated per AWWA, C900, DR18, Class 150. Water mains larger than 12" shall be constructed of Ductile Iron Pipe. (See Section 5.3, A.1.) All PVC pipe less than 4" in 2" diameter shall be Schedule 80 with a pressure rating of 200 psi solvent welded, including blow-off assemblies. PVC pipe will be acceptable for pipe diameters of 12" or less.

PVC pipe 4" in diameter or larger shall have provisions for expansion and contraction provided in the joints. All joints shall be designed for push-on make-up connections. Push-on joint may be a coupling manufactured as an integral part of the pipe barrel consisting of a thickened section with an expanded bell with a groove to retain a rubber sealing ring of uniform cross section, similar and equal to John's Mannville ring-type and Ethyl Bell Ring or may be made with a separate twin gasketed coupling similar and equal to Certainteed Fluid-Type.

High Density Polyethylene (HDPE)- Lee County Utilities has the option of approving the use of HDPE up to 12" in diameter for water main crossings of roadways, ditches, canals, and environmentally sensitive lands. HDPE water mains shall have the same

equivalent internal diameter and equivalent pressure class rating as the corresponding PVC pipe, unless otherwise approved by Lee County Utilities. HDPE must have at least three equally spaced horizontal blue marking stripes. For all roadway crossings a steel or DR 11 HDPE casing pipe must be provided. The Department of Transportation having jurisdiction of said road and right-of-way must grant specific approval.

3. Service Connections

All potable service taps shall be located in open/green areas unless specifically approved by Lee County Utilities. Any service taps that are approved within a paved area, a 2" cast iron body gate valve shall be used in lieu of a corporation stop.

Service connections shall be installed at the locations and in the manner shown on the drawings. Refer to 5.3 for approved service connection materials.

Service clamps for PVC mains shall be full-circle bearing types as shown on the details in Section 9 and double-strap tapped saddle service clamps for ductile iron mains.

Corporation stops and curb stops shall be fitted with a compression connection outlet with split-lock devices for polyethylene or copper pipe.

On curbed streets the exact location for each installed service shall be marked by etching or cutting a "W" in the concrete curb; where no curb exists or is planned, locations shall be adequately marked by a method approved by Lee County Utilities.

Service connection shall not be installed on pipeline 16" and larger unless extenuating conditions exist and said connection is approved by Lee County Utilities Director or designee.

When practical, in new residential, commercial, or/and industrial subdivisions, the corporation stop shall be located at the intersecting property line or in the center of the lot.

- a Copper Pipe Copper pipe for 3/4" to 1" service line installations shall be American manufactured, Type K, and conform to the requirements of ASTM designation B88. Brass compression couplings with screw-clamp fittings shall be used with copper pipe.

- b Polytubing Polyethylene Tubing Endopure PE3408 with ultra violet inhibitors and lifetime warranty, CTS Blue 3408 Polyethylene tubing or approved equal, will be acceptable in sizes from 3/4" to 2" in diameter. Tubing for service lines shall be of a type approved by the National Sanitation Foundation for use in transmitting fluids for human consumption. The tubing shall be designed for a minimum burst pressure of 630 psi for water at 23°C, and shall be manufactured in accordance with the requirements of ASTM D 3350, D2737, AWWA C901-88 and shall be blue in color.

B. Fittings (See Technical Specifications)

C. Resilient, Wedge or Gate Valves and Boxes (See Technical Specifications)

D. Gate Valves and Boxes Greater Than 20" in Diameter (See Technical Specifications)

E. Check Valves (See Technical Specifications)

F. Backflow Prevention Devices (See Technical Specifications)

G. Meter Boxes

- Meters less than 1" shall be installed in a Quazite PG1118BB12 box with Quazite PG1118WAP1 cover, or CDR WB00-1118-12 box with CDR WC00-1118-2C cover.
- Meters 1" through 2" shall be installed in a Quazite PG1730BB12 box with Quazite PG1730WAP1 cover, or CDR WB-1730-12 box with CDR WC00-1730-2C cover.
- Meters larger than 2" shall be installed above ground and approved by Lee County Utilities. Refer to Section 9 for details.

Meter boxes, which need to be replaced, shall be Quazite PG1015WAR,1 or CDR R-1017-2C. Should just the cover need to be replaced it shall be Quazite PG1730WAP1, or CDR WC00-1730-2C.

H. Concrete (See Technical Specifications)

I. Sand (See Technical Specifications)

J. Valve Boxes

Cast iron valve boxes shall be provided for all valves installed underground which do not have extended operators such as is required by the plug valves. The valve boxes shall be adjustable to fit the designated depth of each cover over the valve and shall be designed so as to prevent the transmission of surface loads directly to the valve or piping. Valve boxes shall have an interior diameter of not less than 5". The valve boxes shall be provided with covers marked with the word "WATER". The covers shall be so constructed as to prevent tipping or rattling. Valve boxes shall be manufactured by OPELIKA FOUNDRY COMPANY, Opelika, Alabama or TYLER PIPE DIVISION, Tyler, Texas or approved equal.

K. Air Release Valves (See Technical Specifications)

L. Restraining Devices (See Technical Specifications)

- Joint restraint devices for ductile iron mechanical joint pipe and ductile iron mechanical joint fittings to ductile iron pipe shall be EBAA Iron Inc., Series 1100 Megalug (R), Star Pipe Products, L.P, or approved equal.
- Bell joint restraint devices for ductile iron push joint pipe shall be EBAA Iron Inc., Series 1700 Megalug (R) for bell restraint, Star Pipe Products L.P., or approved equal.
- Joint restraint devices for C-900, C905 PVC pipe used with ductile iron mechanical joint fittings shall be EBAA Iron Inc., Series 2000 PV, Uni-Flange 1300, Star Pipe Product, L.P., or approved equal.
- Bell joint restraint devices for PVC push joint pipe shall be EBAA Iron Inc., Series 1600 for C-900 PVC pipe, Series 2800 for bell restraint on C-905 PVC pipe or Uni-Flange Series 1300, 1360 or 1390 or ROMAC Series 600, Star Pipe Products L.P., or approved equal.
- C-900 or C-905 PVC fittings shall be restrained with EBAA Iron Inc., Series 2500 bell restraint for PVC fittings, Star Pipe Products, L.P, or an approved equal.
- Bolts and nuts shall be Ductile Iron or 300 Series Stainless Steel, T-Head type with hexagonal nuts. Bolts and nuts shall be machines through and nuts shall be tapped at right angles to a smooth bearing surface.

5.4 EXCAVATION, TRENCHING, BACKFILLING, AND RESTORATION

A. General

The provisions set forth in this Section shall be applicable to all underground water piping installations regardless of location. Special design considerations shall require approval from Lee County Utilities.

B. Materials (See Technical Specifications)

1. Sheeting and Bracing (See Technical Specifications)
2. Concrete (See Technical Specifications)

C. Workmanship (See Technical Specifications)

1. Trench Dimensions (See Technical Specifications)
2. Trench Grade (See Technical Specifications)
3. Utility Bedding (See Technical Specifications)
4. Unsuitable Material Below Trench Grade (See Technical Specifications)

5. Extra Utility Bedding Material (See Technical Specifications)
6. Excavated Material (See Technical Specifications)
7. Material Disposal (See Technical Specifications)
8. Borrow (See Technical Specifications)
9. Rock Excavation (See Technical Specifications)
10. Dewatering (See Technical Specifications)
11. Obstructions (See Technical Specifications)
12. Backfill (See Technical Specifications)
13. Protective Concrete Slab

Refer to Section 9 for Details.

14. Restoration (See Technical Specifications)
15. Protection and Restoration of Property (See Technical Specifications)
16. Cleanup (See Technical Specifications)
17. Excavation Site Safety (See Technical Specifications)

5.5 ADDITIONAL INSTALLATION REQUIREMENTS (See Technical Specifications)

A. Pipe

1. Inspection of Material (See Technical Specifications)
2. Pipe Cleanliness (See Technical Specifications)
3. Pipe Gradient (See Technical Specifications)
4. Pipeline Identification (See Technical Specifications)
5. Pipe Joint Deflection (See Technical Specifications)
6. Rejects (See Technical Specifications)

7. Polyvinyl Chloride Pipe (See Technical Specifications)
 8. Restraining Devices Anchors (See Technical Specifications)
 9. Joints (See Technical Specifications)
- B. Installing Valves and Boxes (See Technical Specifications)
- C. Installing Hydrants (See Technical Specifications)
- D. Concrete Encasement

Concrete encasement shall be constructed in accordance with details as shown in Section 9 when:

1. A waterline crosses at a depth which provides less than 18" clear distance from a sewer line. Encasement shall extend a minimum of 10-feet on each side of the point of crossing. Encase the sewer main, unless specifically approved by Lee County Utilities.
2. A waterline running parallel to a sewer line provides less than 10 feet separation. Encase the sewer main, unless specifically approved by Lee County Utilities.
3. The Engineer has ordered the line encased and specifically approved by Lee County Utilities.

The points of beginning and ending of pipe encasement shall be not more than 6" from a pipe joint to protect the pipe from cracking due to uneven settlement of its foundation or the effects of superimposed live loads.

E. Flush Out Connections

Flush out connections shall be installed on all dead end water mains at the locations and in accordance with the details shown in Section 9.

F. Casing Installations

1. General

The provisions of this section shall represent the minimum standards for the installation of casing pipe for water main pipeline.

Water mains to be placed under all Lee County Department of Transportation roadways shall be installed in a casing. The steel casing and procedures shall conform to the requirements of Lee County DOT as outlined in "Administrative Code "AC-11-12" and

any supplements thereto. All work and materials shall be subject to inspection by DOT. The Department's property and surface conditions shall be restored to the original condition in keeping with the Department's specifications and standards.

In general, all underground water lines crossing all existing or proposed Lee County roadways, Florida State Highways and railroads shall be installed under these traffic ways within steel casing pipe. Specific crossing requirements shall be obtained in advance from the authority having jurisdiction.

It shall be the responsibility of the developer or engineer to submit the necessary permit documents and data to the appropriate authority and receive approval thereof.

The Contractor shall maintain traffic on the roadway and shall keep all workmen and equipment clear of the travelway during the work. All safety regulations of the Department and any permit(s) shall be complied with.

2. Casing Pipe Material and Installation

Casing pipes crossing under County roadways shall be located at suitable approved alignments in order to eliminate possible conflict with existing or future utilities and structures with a minimum 30" depth of cover between the top of the casing pipe and the surface of the roadway. Casings shall be prime steel pipe conforming to the requirements of ASTM Designation A-139. Unless otherwise approved by Lee County Utilities, the minimum casing pipe size and wall thickness shall be as shown in the following table, for the water carrier pipe size indicated. For sizes not included therein, or for special design considerations, approval shall be obtained from Lee County Utilities. PVC shall be an acceptable casing material for service lines.

For PVC and DIP Pressure Carrier Pipes

Carrier Pipe Normal Size Inches	Casing Pipe Nominal Diameter Inches	Casing Pipe Wall Thickness Inches
4	45	0.250
6	16	0.250
8	18	0.250
10	20	0.250
12	24	0.312
14	28	0.312
16	30	0.312
20	36	0.375
24	42	0.500

HDPE Carrier Pipe

HDPE may be used as the carrier pipe and casing pipe with approval from Lee County Utilities. The HDPE casing shall be a minimum SDR 11 and there shall be a minimum of 4" clearance between the interior of the casing pipe and the outside of the carrier pipe, unless otherwise approved by the County.

For casing pipe crossings under roadways, railroads, or other installations not within the jurisdiction of Lee County, the Contractor shall comply with the regulations of said authority in regard to design, specifications and construction. State Highway casing installations shall be as specified in the FDOT, "Utility Accommodation Guide", and for railroads, the American Railway Engineering Association, Part 5, Section 5.2, "Specifications for Pipelines Conveying Nonflammable Substances", shall be applicable. However, in no case shall the minimum casing pipe diameter and wall thickness, for a specific carrier pipe size, be less than that specified above.

3. Carrier Pipe

Water main carrier pipes to be installed within the casings shall be Restrained Joint Ductile Iron, or PVC Pipe in accordance with Section 5.3 and the requirements of the installation permit. Pipe and fittings shall comply with the applicable provisions of these Standards. Special supporting of the carrier pipe within the casing shall be required with a design approved by Lee County Utilities.

Stainless steel carriers with Teflon skids, or The Booster Casing Spacers, being on center and restrained shall be the preferred method for installing the carrier pipe. Spacers shall be installed 7 feet, or less, on center. After the carrier pipe has been tested for leakage, the casing shall have the ends blocked with either a 8" wall of brick masonry with a weep hole installed near the bottom of each wall or Cascade Model CCES End Seals with stainless steel bands.

High-density polyethylene Raci casing spacers or approved equal, can be used for all size PVC pipes and on DIP pipe with diameters 12" or less. The spacers shall be of a projection type with a minimum number of projections around the circumference totaling the number of carrier pipe diameter inches. Casing spacers shall be spaced every 6.5 ft. with double spacers on each end of the casing. The casing spacers shall provide a minimum safety factor of 2 to 1 to support the service load.

G. Testing and Disinfection

1. Flushing

All water mains shall be flushed to remove all sand and other foreign matter. The velocity of the flushing water shall be at least 1.2 m/s (4 fps). Flushing shall be terminated at the direction of the Engineer. The Contractor shall dispose of the flushing

water without causing a nuisance or property damage, and meet all regulatory requirements for the protection of the environment.

2. Hydrostatic Testing

The Contractor shall perform hydrostatic testing of all water distribution system as set forth in the following, and shall conduct said tests in the presence of representatives from the County and other authorized agencies, with 48 hours advance notice provided.

Piping and appurtenances to be tested shall be within sections between valves unless alternate methods have received prior approval from the County. Testing shall not proceed until concrete thrust blocks are in place and cured, or other restraining devices installed. All piping shall be thoroughly cleaned and flushed prior to testing to clear the lines of all foreign matter. While the piping is being filled with water, care shall be exercised to permit the escape of air from extremities of the test section, with additional release cocks provided if required.

Hydrostatic testing shall be performed with a sustained pressure for a minimum of two (2) hours at 150 psi pressure or 2-1/2 times working pressure, whichever is higher, unless otherwise approved by Lee County Utilities, for a period of not less than two (2) hours. Testing and passing results shall be in accordance with the applicable provisions as set forth in the most recent edition of AWWA Standard C600. The allowable rate of leakage shall be less than the number of gallons per hour determined by the following formula:

$$L = \frac{SD(P)^{0.5}}{133,200}$$

L = Allowable leakage in gallons per hour;
S = Length of pipe tested in feet;
D = Nominal diameter of the pipe in inches;
P = Average test pressure maintained during the leakage
test in pounds per square inch
For 150 psi, L = (9.195 EE-5)SD

The testing procedure shall include the continued application of the specified pressure to the test system, for the two (2) hour period, by way of a pump taking supply from a container suitable for measuring water loss. The amount of loss shall be determined by measuring the volume displaced from said container.

Should the test fail, necessary repairs shall be accomplished by the Contractor and the test repeated until results are within the established limits. The Contractor shall furnish the necessary labor, water, pumps, and gauges at specified location and number and all other items required to conduct the required water distribution system testing and perform necessary repairs.

3. Disinfection

Following acceptable pressure testing, the Contractor shall disinfect all sections of the water distribution system and receive approval thereof from the appropriate agencies, prior to placing in service. Advance notice of 24 hours shall be provided to the County before disinfecting procedures start. The disinfection shall be accomplished in accordance with the applicable provisions of AWWA Standard C601, "Disinfecting Water Main" and all appropriate approval agencies.

The disinfecting agent shall be free chlorine in aqueous solution with sustained concentration for 12 hours or more of not less than 50 parts per million. Chlorine may be derived from Chlorine gas, or 70% (high-test) calcium hypochlorite (HTH or Perchloron, or equal). Administration may be by any of the several methods described in AWWA Standard C601 as proposed by the Contractor and approved by the Engineer. Proposals as to method must be made prior to commencement of the disinfection process.

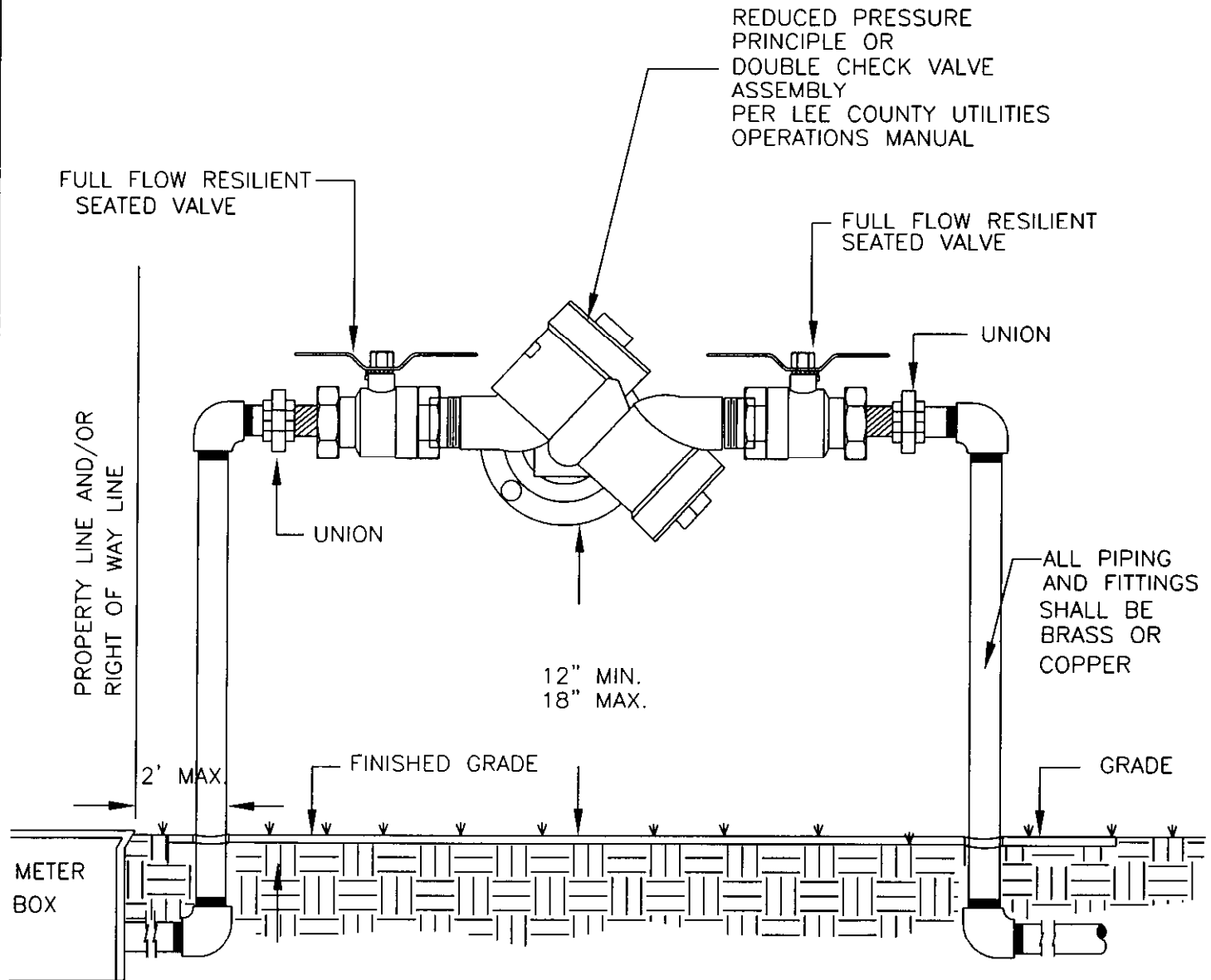
Following contact with chlorine solution, the system shall be thoroughly flushed out. Samples shall then be taken using sterile containers obtained from the County Health Department. Samples shall be taken by the Contractor and delivered by him to the County Health Department or approved laboratory for analysis.

If samples do not demonstrate satisfactory results, the disinfection procedure shall be repeated until two series of satisfactory samples are obtained, the period between such series of samples to be a minimum of 24 hours.

STANDARD DETAIL NO. 9.11

LEE COUNTY UTILITIES

3/4" TO 2" CROSS CONNECTION CONTROL ASSEMBLY

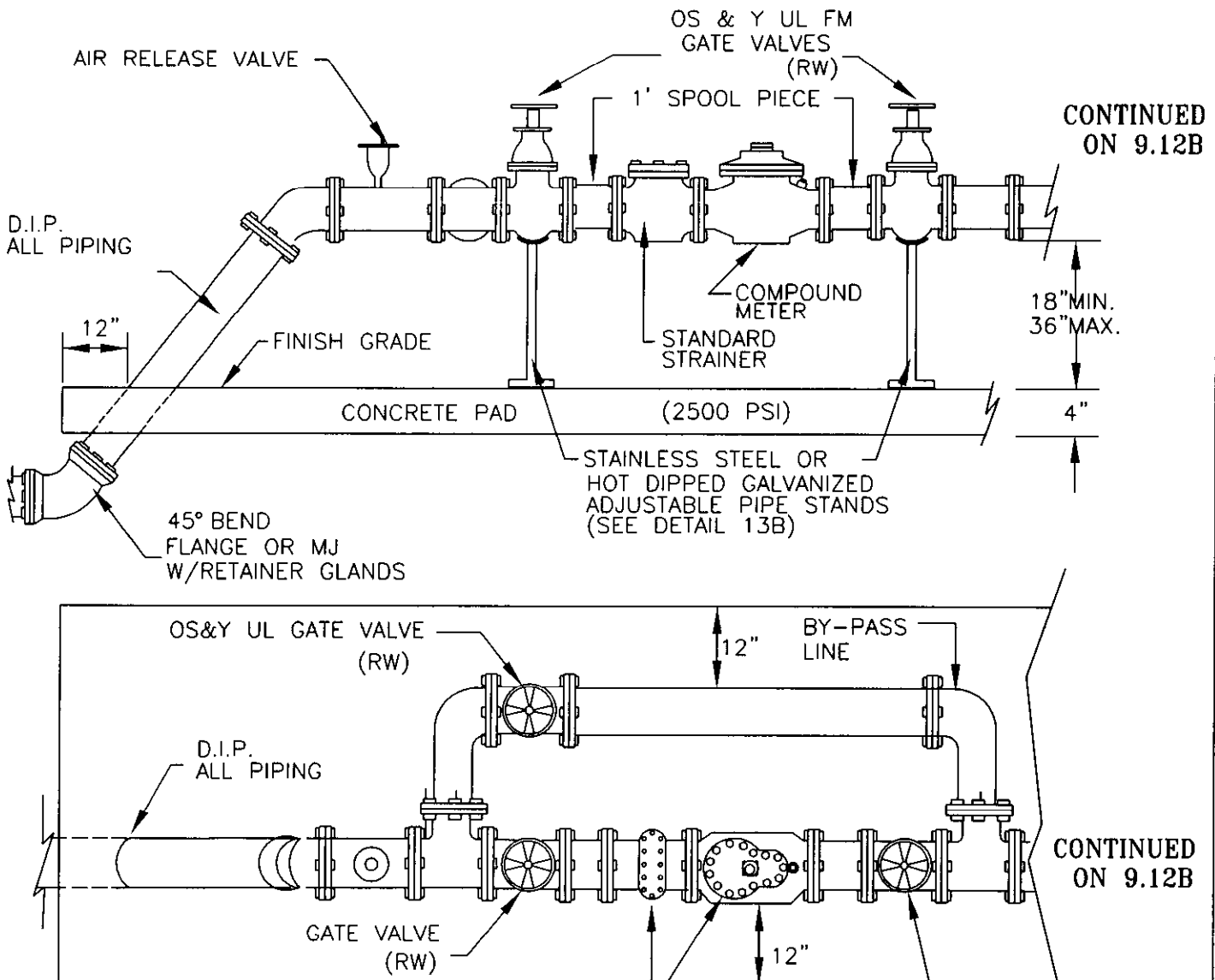


- NOTES:
- 1. DIELECTRIC UNIONS REQUIRED
 - 2. INITIAL AND ANNUAL DEVICE TESTING REQUIRED

STANDARD DETAIL NO. 9.12A

LEE COUNTY UTILITIES

2 1/2" OR LARGER COMPOUND METER AND/OR CROSS CONNECTION CONTROL ASSEMBLY



NOTES:

1. USE COMPOUND METER IF FOR POTABLE WATER ONLY
2. USE FIRELINE METER IF FOR POTABLE AND FIRE SUPPRESSION BOTH
3. PAINT IN ACCORDANCE WITH LEE COUNTY UTILITIES OPERATIONS MANUAL
4. ALL PIPING BETWEEN THE BELOW GROUND 45° BENDS AND THROUGH THE ASSEMBLY SHALL BE DIP, PRESSURE CLASS 350
ABOVE GROUND DIP SHALL BE FLANGED

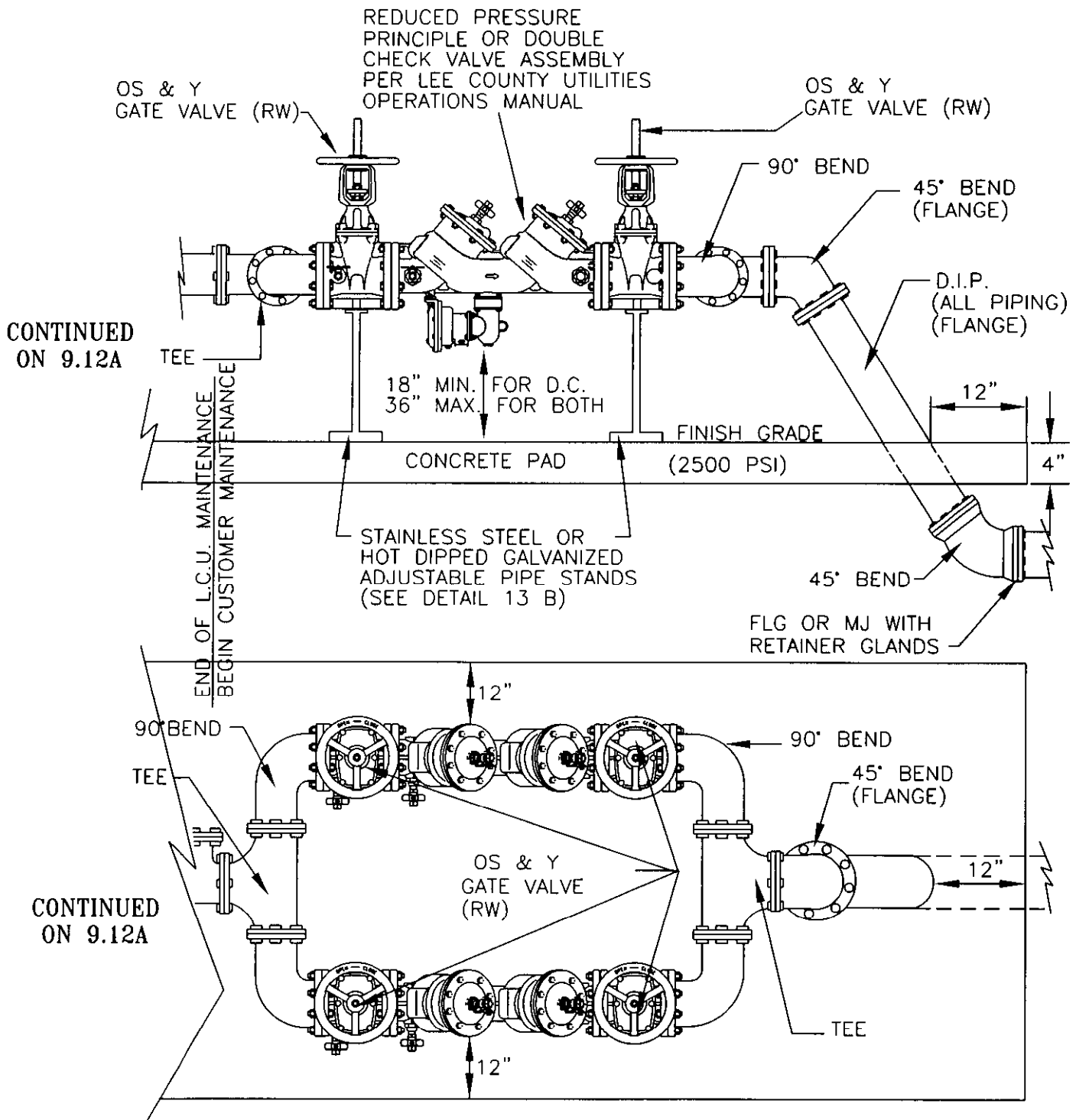
STRAINER & COMPOUND METER PER LEE COUNTY UTILITIES OPERATIONS MANUAL

STANDARD DETAIL NO.9.12B

LEE COUNTY UTILITIES

2 1/2" OR LARGER COMPOUND METER

AND/OR CROSS CONNECTION CONTROL ASSEMBLY



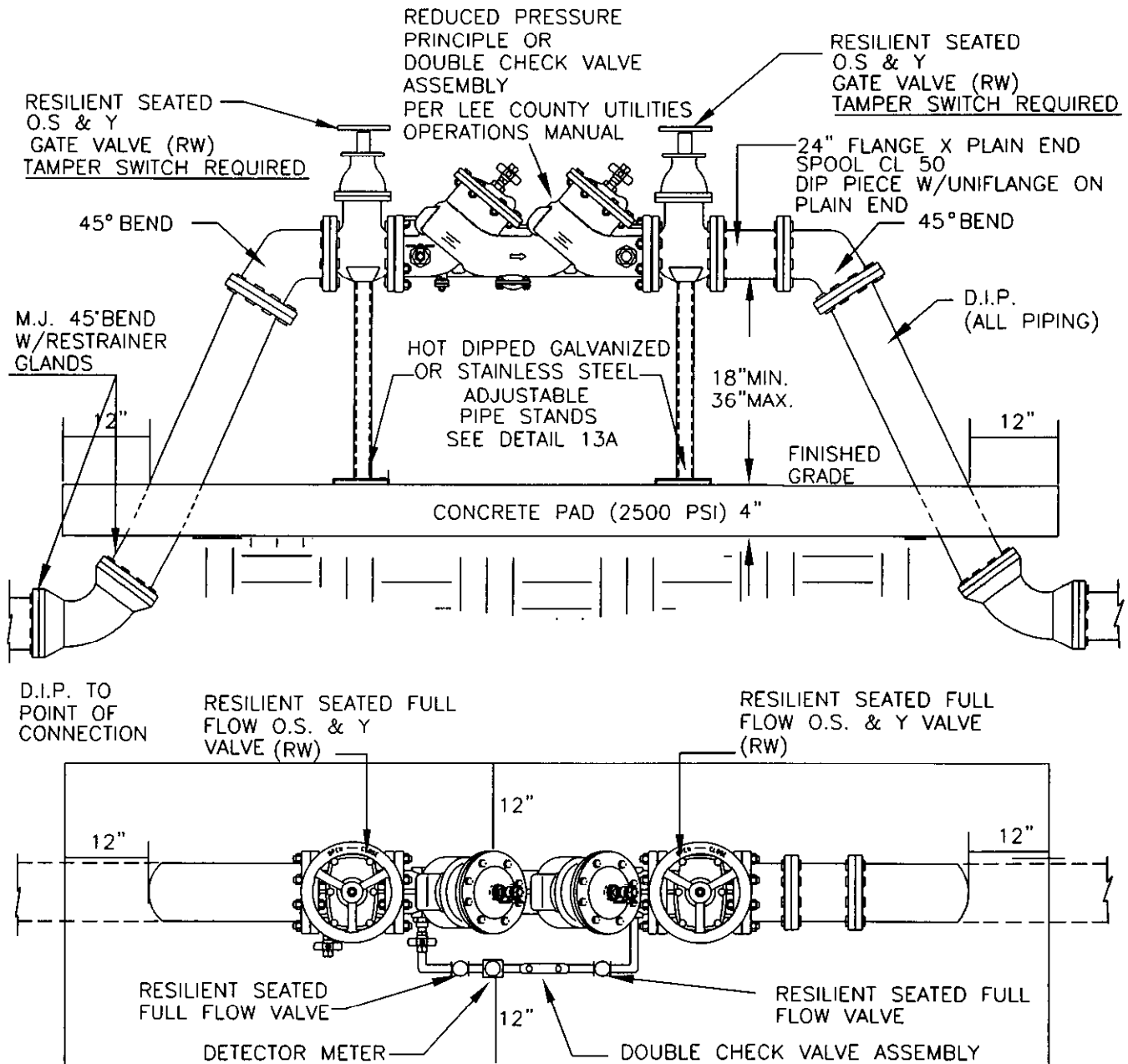
NOTE: IF UNINTERRUPTED SERVICE IS NOT REQUIRED, A SINGLE BACKFLOW PREVENTION DEVICE MAY BE INSTALLED, AND TEES AND BENDS ELIMINATED.

NTS

STANDARD DETAIL NO. 9.13A

LEE COUNTY UTILITIES

2 1/2" CROSS CONNECTION CONTROL ASSEMBLY



NOTE: 1. PAINT IN ACCORDANCE WITH LEE COUNTY UTILITIES OPERATIONS MANUAL.

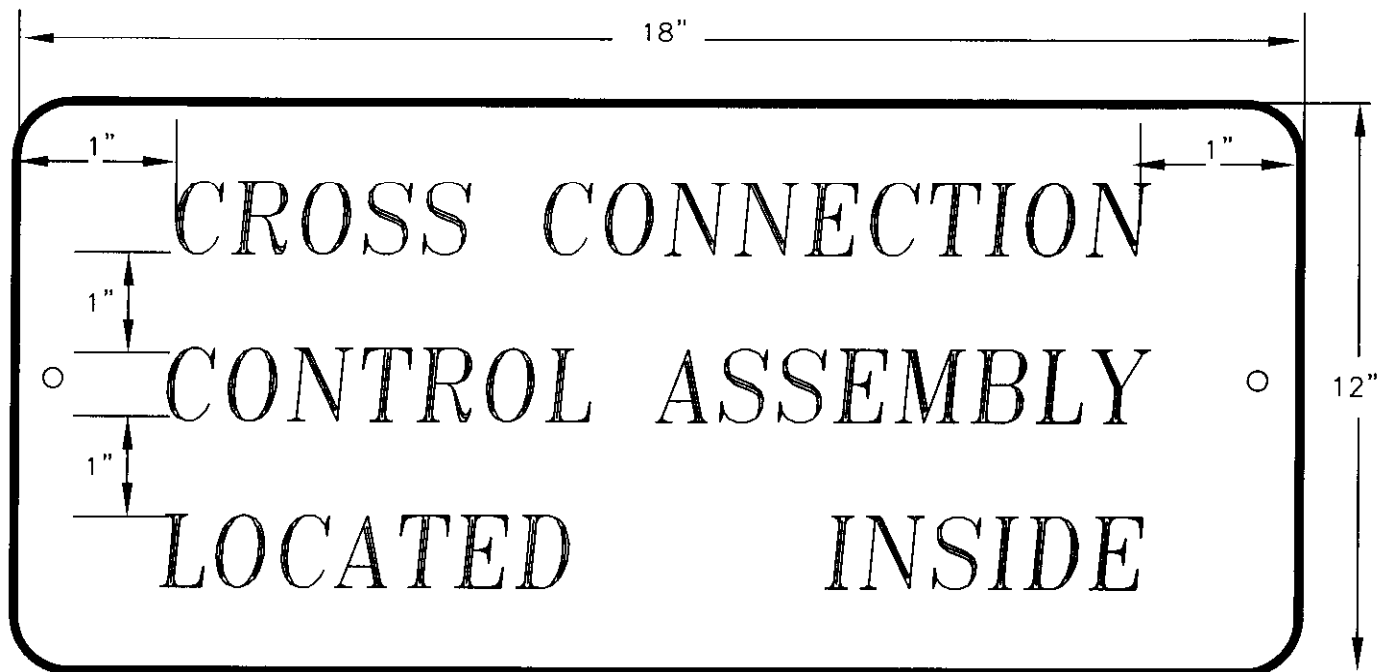
2. ALL PIPING BETWEEN THE BELOW GROUND 45 BENDS AND THROUGH THE ASSEMBLY SHALL BE DIP, PRESSURE CLASS350 ABOVE GROUND DIP SHALL BE FLANGED

NTS

DATE: 06/26/2003

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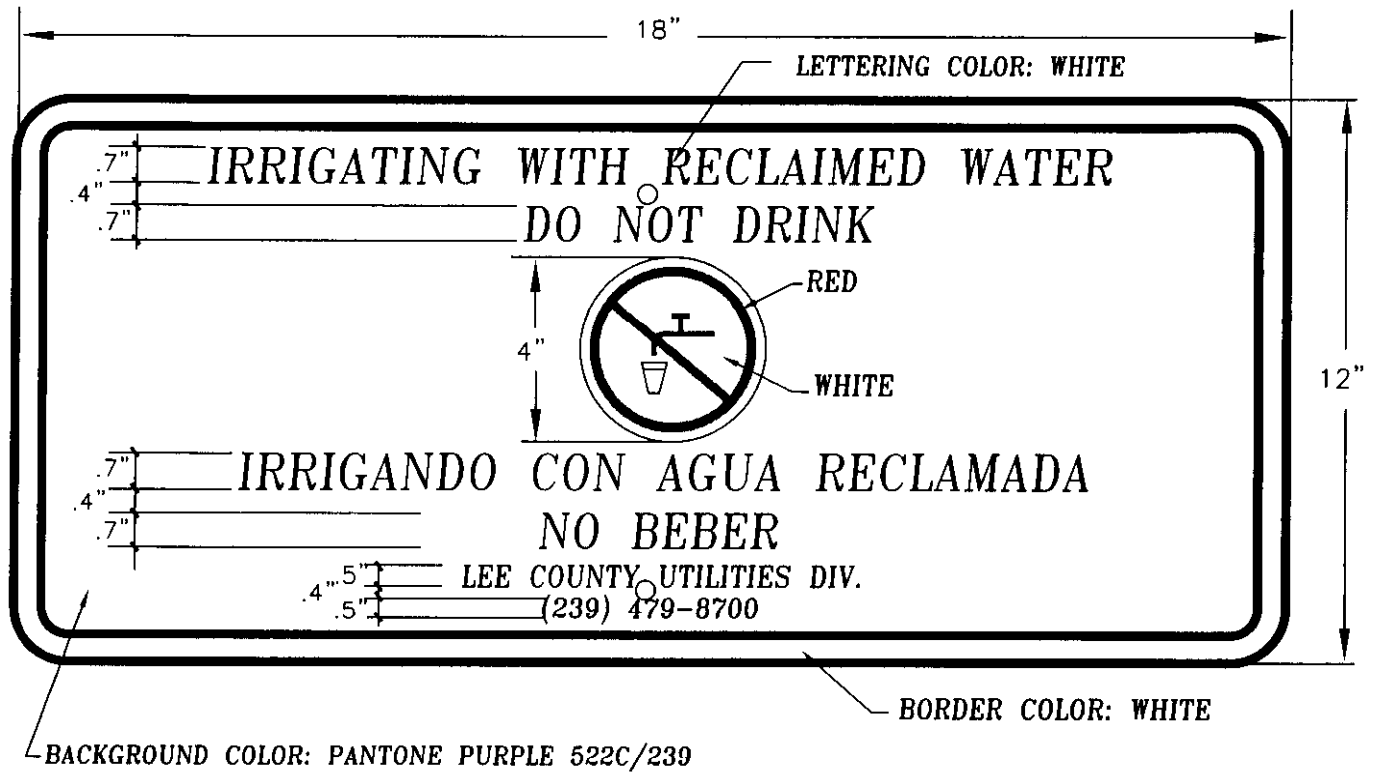
STANDARD DETAIL NO. 9.47
LEE COUNTY UTILITIES
CROSS CONNECTION CONTROL SIGNAGE



NOTES:

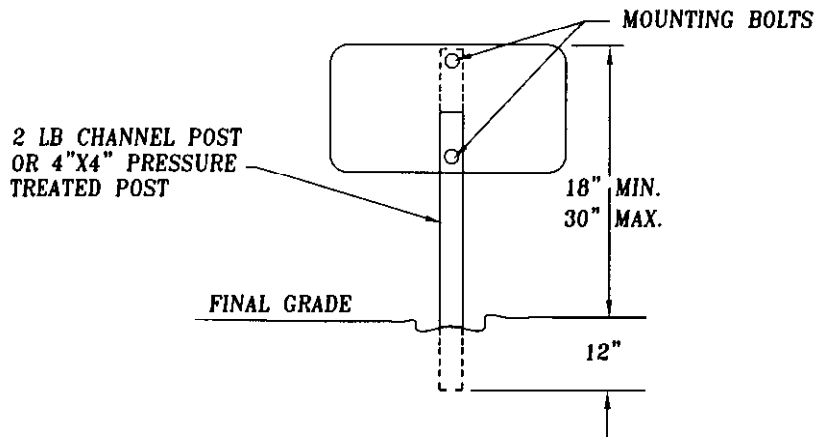
1. SIGN TO BE USED WHEN A CROSS CONNECTION CONTROL ASSEMBLY IS REQUIRED TO BE PLACED INSIDE A BUILDING
2. SIGN SHALL BE SECURELY BOLTED TO WALL 24 INCHES ABOVE INCOMING WATER SUPPLY PIPE OR GROUND LEVEL, WHICHEVER IS HIGHEST.
3. SIGN BLANK SHALL BE ALUMINUM WITH ENGINEERING GRADE REFLECTIVE WHITE BACKGROUND AND BLACK LETTERING.

STANDARD DETAIL NO. 9.48
LEE COUNTY UTILITIES
IRRIGATING WITH RECLAIMED WATER SIGNAGE



NOTES:

1. SIGNAGE REQUIRED WHEN RECLAIMED WATER IS USED ON ANY PREMISES.
2. SMALLER SIGNS MEASURING 12" LONG BY 9" DEEP MAY BE SUBSTITUTED FOR USE AT PRIVATE RESIDENCES.

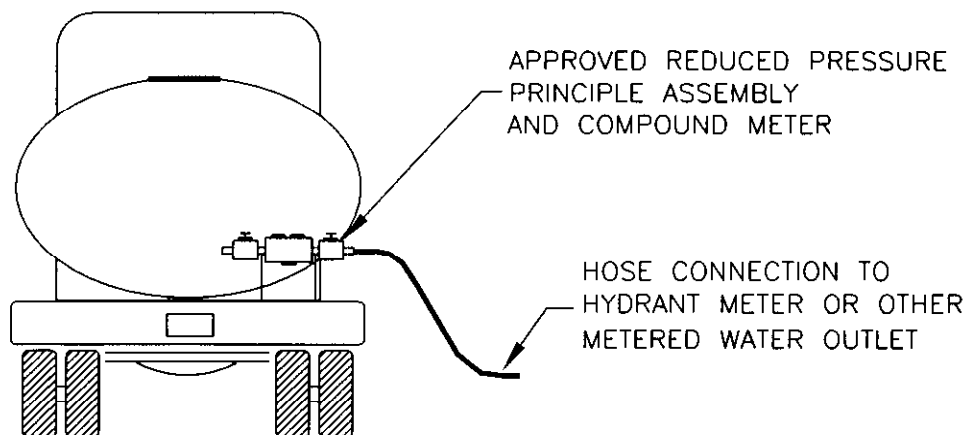
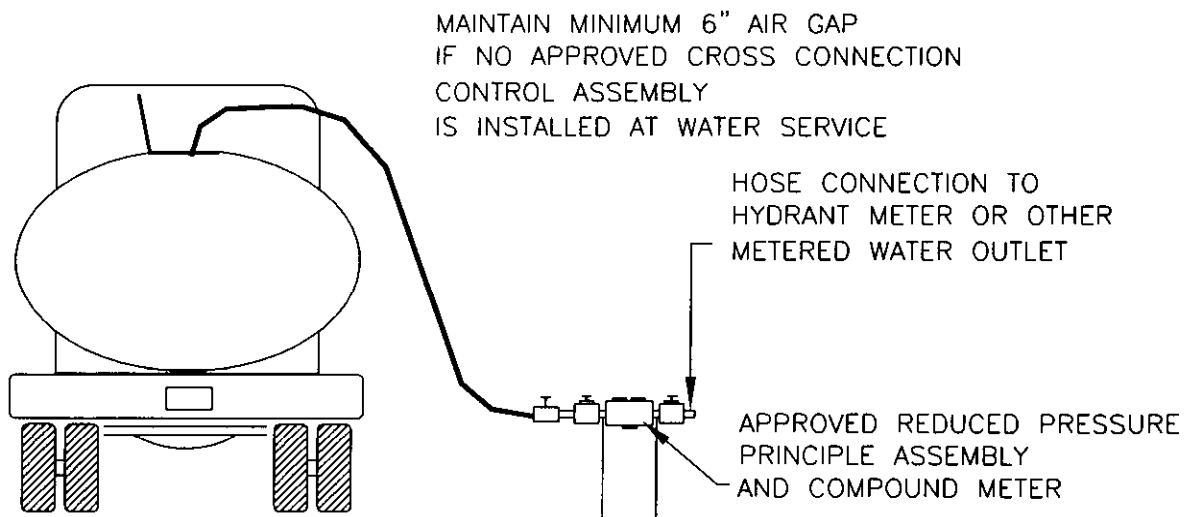
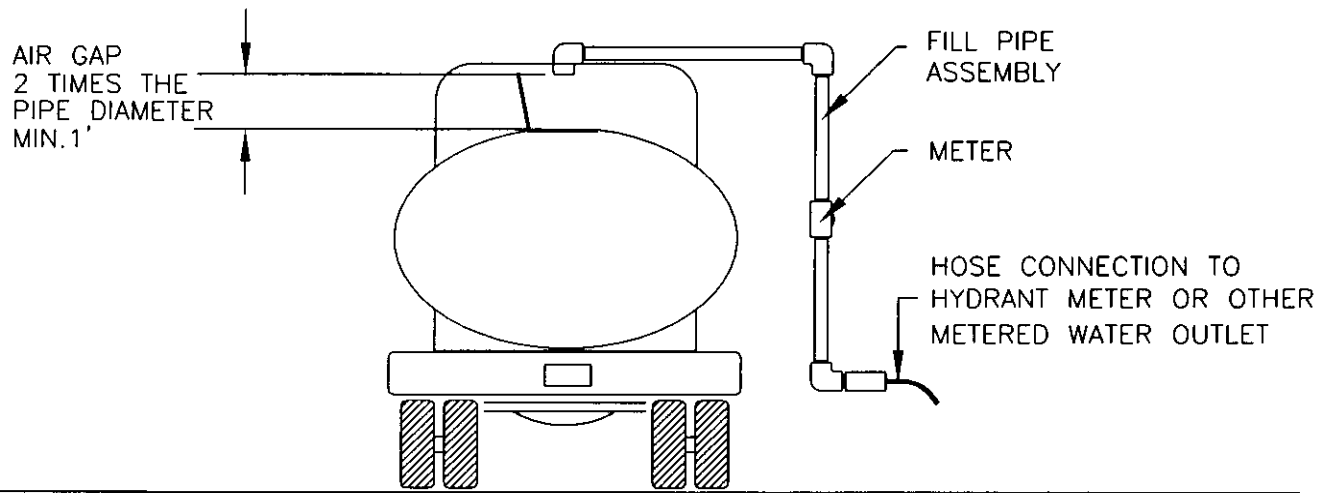


3. SIGN SHALL BE MOUNTED IN ACCORDANCE WITH THIS STANDARD DETAIL.

STANDARD DETAIL NO. 9.49

LEE COUNTY UTILITIES

WATER TANKER TRUCK - AIR GAP SEPARATION



NTS

**SECTION 12
CROSS CONNECTION CONTROL POLICY**

12.1 GENERAL

This Cross-Connection Control Policy (Policy), as adopted by the Lee County Board of County Commissioners through Ordinance #95-21, entitled “Potable Water Cross Connection Control Program” and as part of the Lee County Utilities Operations Manual (Manual), serves to insure that the safety of the potable water system of the Lee County Utilities (LCU) is maintained.

LCU:

- A. Requires the review of this Policy before designing a project or installing a cross connection control device,
- B. Believes the material in this Policy will provide the Customer with the understanding of cross-connections and cross connection control assemblies,
- C. Will insure that the standards and specifications as set forth in this Policy will be uniformly enforced,
- D. Reserves the right to update this Policy as necessary due to changes in FDEP policies and regulations and/or AWWA standards.

12.2 GOALS

A. Protection of the Public Water Supply System

To protect the public potable water supply from the possibility of contamination or pollution by isolating actual and/or potential cross-connections from the public potable water supply system that could create backflow by backpressure or back-siphonage (Rule 62-555 or latest edition, F.A.C.).

B. Elimination of Cross-Connections

To promote the elimination and control of cross-connections, actual or potential, between the public potable water system(s), and any other system(s) or plumbing fixture(s) in existing and future buildings and developments.

C. 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 public potable water supply system, as required by the FDEP (Rule 62-555 or latest edition, F.A.C.).

12.3 AUTHORITY

A. Federal

The United States Congress enacted the Safe Drinking Water Act (PL 93-532) into law 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 Standard 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 as 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 serve 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 EPA retains authority over states that do not obtain primacy.

B. State of Florida

The State was granted primacy over the water program under the authority of the "Florida Safe Drinking Water Act" Chapter 403-850-403.864 F.A.C. and Rule 17-22 "Public Drinking Water Systems". The regulations went into effect in November of 1977. The State's regulations were revised in November of 1987 to address the topic of cross-connection control and incorporated more specific language than that contained in the federal regulations. The State's regulations (Rule 17-22, F.A.C.) were revised again, and renumbered in January of 1989 as Rules 17-555 and 17-560, F.A.C. In December of 1996, Florida revised and renumbered their regulations again to Rules 62-550 and 62-555, F.A.C., respectively.

Rule 62-550.200 (18), 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 62-555.360(1), F.A.C. states, "Cross-connection as defined in Rule 62-550.200, F.A.C. is prohibited."

Rule 62-555.360(2), F.A.C. 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 cross connection control assembly where an actual and/or a potential cross-connection may exist, (Rule 62-555.360(3), F.A.C.).

The authority to control and supervise the installation of approved cross connection control devices rests with the "supplier of water or his designated representative..." (Rule 62-555.360(4), F.A.C.).

C. Accepted Practices

The program shall utilize the accepted practices of the American Water Works Association guidelines as set forth in AWWA Policy M 14, entitled "Cross Connection Control" and Rule 62-555.330(6) and (7) F.A.C. or latest edition.

D. Objectives

A cross connection 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 LCU's 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.

12.4 DEFINITIONS

A. Analogous Words and Terms

For the purpose of this Policy, the following analogous words and terms shall be interpreted to have similar meanings when not inconsistent with the context:

1. Words used in the singular number include the plural and words used in the plural number include the singular.
2. Words used in the present tense include the future tense.
3. The word "constructed" includes the word "erected," "built," "installed," "rebuilt", and "repaired".
4. The word "structure" includes the word "building".
5. The word "include" is a word of enlargement and not limitation.
6. The word "shall" is mandatory and the word "may" is permissive.

B. Abbreviations

1. Agencies:

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
APWA	American Public Works Association
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing Materials
AWWA	American Water Works Association
DIPRA	Ductile Iron Pipe Research Association
EPA	United States Environmental Protection Agency
FCCCHR	Foundation for Cross Connection Control and Hydraulic Research of the University of Southern California
FDOT	Florida Department of Transportation
FDEP	Florida Department of Environmental Protection
FDNR	Florida Department of Natural Resources

FDOH	Florida Department of Health
FPSC	Florida Public Service Commission
HUD	Department of Housing and Urban Development (Federal and/or State)
LCDNR	Lee County Division of Natural Resources
LCDOT	Lee County Division of Transportation and Engineering
LCU	Lee County Utilities Division
NCPI	National Clay Pipe Institute
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration (Federal and/or State)
UL	Underwriters Laboratories

2. General

DIP	Ductile Iron Pipe
fps	feet per second
F.A.C.	Florida Administrative Code
gpd	gallons per day
gpm	gallons per minute
HDPE	High Density Polyethylene
mgd	million gallons per day
p.s.i.	Pounds per Square Inch (gauge)

PVC Polyvinyl Chloride

ROW Right-of-Way

C. Definitions

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 2 times the diameter of the supply pipe measured vertically above the overflow rim of the vessel with a minimum separation distance of 3 inches.

Approved shall reference an air-gap separation, a double check valve assembly, a reduced pressure principle cross connection control assembly or other cross connection control assemblies or methods that meet the requirements of Rule 62-555 F. A. C.

Atmospheric Vacuum Breaker (AVB) shall mean a cross connection control device that is operated by atmospheric pressure in combination with the force of gravity as defined by Rule 62-555 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. Use of this device shall be restricted to internal plumbing applications and not used for containment purposes at the service connection. (ASSE 1001)

Auxiliary Water Supply shall mean any water supply on or available to the premises other than LCU's potable water supply. These auxiliary waters may include other potable water supplies, wells, ponds, pools, canals, retention areas, or any other natural or manmade water source.

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 Rule 62-555 F.A.C.

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.

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 water system that would cause or tend to cause a reversal of the normal direction

of flow.

Cross Connection Control Assembly shall mean an assembly that has been manufactured in full conformance with AWWA Standards and meets the laboratory and field performance specifications of the FCCCHR. Cross Connection Control Assemblies shall also comply with the requirements of Rule 62-555 F.A.C.

Cross Connection Control Assembly (type) shall mean an 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 approved for use by LCU's Customers for non-internal usage are:

Double Check Valve Assembly
Double Check Detector Assembly
Reduced Pressure Principle Assembly
Reduced Pressure Detector Assembly

or other assemblies approved by the Utilities Director.

Certified Cross Connection Control Assembly Tester (also known as a Certified Backflow Prevention Device Tester) shall mean a person who can provide documentation proving competency in testing cross connection control assemblies to the satisfaction of the Utilities Director. The tester shall have attended and successfully completed an AWWA approved course for Cross Connection Control Assembly Testers, or a course endorsed by the AWWA, or other programs or training acceptable to the Utilities Director and FDEP. All Testers wishing to do business within LCU's service area must attend a mandatory orientation class conducted by County staff prior to being placed on the Approved Certified Cross Connection Control Testers List.

Certified Cross Connection Control Assembly Repairer (also known as a Certified Backflow Prevention Assembly Repairer) shall mean a person who can provide documentation proving competency in repairing cross connection control assemblies to the satisfaction of the Utilities Director. The repairer shall have attended and successfully completed an AWWA approved course for cross connection control Assembly Repairers, or a course endorsed by the AWWA, or other programs or training acceptable to the Utilities Director and FDEP. All repairers wishing to do business within LCU's Service Area must attend a mandatory orientation class conducted by County staff prior to being placed on the Approved Certified Cross Connection Control Assembly Repairers List.

Certified Test Gauges shall be calibrated and certified annually, proof of which shall be required, to FCCCHR Standards by a testing lab approved by the Utilities

Director.

Check Valve shall mean a valve that is drip-tight in the normal direction of flow when the inlet pressure is at least 1 p.s.i. and the outlet pressure is 0 p.s.i. 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 cross connection control assembly, i.e., pressure vacuum breaker, double check valve assembly, or reduced pressure principle assembly.

Contamination shall mean 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.

Cross-Connection shall mean a connection or potential connection between any part of a potable water system and any other environment containing other substances in a manner that, under any circumstances would allow such substances to enter the potable water system. Other substances may be gases, liquids, or solids, such as chemicals, waste products, steam, water from other sources (potable or non-potable), or any matter that may change the color or add odor to the water.

Cross Connections-Controlled shall mean a connection between a potable water system and a non-potable water system with an approved backflow-prevention assembly properly installed and maintained so that it will continuously afford the protection commensurate with the degree of hazard.

Cross-Connection Control by Containment shall mean the installation of an approved backflow-prevention assembly at the water service connection to any Customer's premises, where it is physically and economically unfeasible to find and permanently eliminate or control all actual or potential cross-connections within the Customer's water system; or it shall mean the installation of an approved backflow-prevention assembly on the service line leading to and supplying a portion of a Customer's water system where there are actual or potential cross-connections that cannot be effectively eliminated or controlled at the point of the cross-connection.

Customer shall mean the owner or operator of a private plumbing and/or water system who receives water from LCU's potable water system.

Double Check Detector Assembly (DCDA) shall mean a specifically 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. The valves are located between two tightly closing resilient-seated shutoff valves as an assembly and equipped with properly located resilient-seated test cocks. This assembly shall be used to protect against a non-health hazard (pollutant) and uses subject to low water flows such as fire protection systems. (ASSE 1015)

Double Check Valve Assembly (DCVA) shall mean an assembly consisting of two internally loaded check valves, either spring loaded or internally weighted installed as a unit between two tightly closing resilient-seated shutoff valves and fittings with properly located resilient-seated test cocks. This assembly shall be used to protect against a non-health hazard (pollutant) and uses not subject to low water flows. (ASSE 1015)

Fire Protection System shall mean any system, public or private, used exclusively for the purpose of having water ready for the extinguishing of fire, usually sprinkler systems, hose rack systems, or hydrant systems, metered and unmetered, connected or independent of the waterworks system.

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

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

Hazard (plumbing) shall mean an internal cross-connection in a Customer's potable water system that may be either a pollution or a contamination type hazard. This includes but is not limited to cross-connections with toilets, sinks, lavatories, wash trays, 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. An appropriate type of cross connection control assembly must properly protect all structures.

Hazard (pollution) shall mean an actual or potential threat to the physical properties of the potable water system or the potability of the public or the Customer'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.

Health Agency refers to the FDOH or FDEP, depending upon jurisdiction.

Hose Bib Vacuum Breaker (HBVB) shall be any approved cross connection control device that consists of a spring loaded check valve that allows the device to vent to the atmosphere when the water is turned off. Use of this device shall be restricted to internal plumbing applications and not used for containment purposes at the service connection. (ASSE 1011)

Industrial Fluids shall mean any fluid or solution that may physically, chemically, biologically or otherwise contaminate or pollute potable water if introduced into the potable water system or Customer 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 alkalis; 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 water such as from wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, etc., oil, gases, glycerin, paraffins, caustic and acid solutions; and other liquid and gaseous fluids used in commercial/industrial type processes or for fire fighting purposes.

Industrial Piping System (Customer's) shall mean any system used by the Customer 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.

Internal Use shall mean the utilization of a device or devices within any premises on the Customer's side of a water supply meter and/or master meter assembly and beyond the primary Cross Connection Control Device that protects the public water supply.

Laboratory (approved for testing) shall mean the foundation for FCCCHR or other testing laboratory approved by the Utilities Director.

Master Meter Assembly shall mean a meter and cross connection control assembly combination that serves two or more entities on a single non-single family or non-duplex residential premise. The meter shall be a compound type and the cross connection control assembly shall be a reduced pressure detector assembly type.

Plumbing Official shall mean the Lee County Division of Codes and Building Code Enforcement Official.

Plumbing System shall mean the water supply and distribution pipes, plumbing

fixtures and traps, soil, waste and vent pipes, building drains and sewers, including their respective connections, devices and appurtenances within the property line of the premises, and water-treating or water-using equipment.

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.

Pressure Vacuum Breaker Assembly (PVB) 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, with properly located resilient-seated test cocks and tightly closing resilient-seated shutoff 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 and should not be used if backpressure could develop in the downstream piping. This assembly shall be used typically on irrigation systems not utilizing an auxiliary water source and not having elevated sprinkler heads. (ASSE 1020)

Reclaimed Water (formerly known as Reuse Water and Effluent Reuse) shall mean treated and disinfected effluent from a wastewater treatment plant used for irrigation, dust control, and all other purposes permitted by the F.A.C.

Reduced Pressure Detector Assembly (RPDA) shall mean an assembly containing two independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve 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. These units are located between two tightly closing resilient-seated shutoff valves as an assembly and equipped with properly located resilient-seated test cocks. This assembly shall be designed to protect against a health hazard (contaminant) and uses subject to low water flows. (ASSE 1013)

Reduced Pressure Principle Assembly (RPPA) shall mean an assembly containing two independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve. These units are located between two tightly closing resilient-seated shutoff valves as an assembly and equipped with properly located resilient-seated test cocks. This assembly shall be designed to protect against a health hazard (contaminant) and uses not subject to low water flows. (ASSE 1013)

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 Customer'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.

Utilities Director shall be the person in charge of LCU vested with the authority and responsibility for the implementation of an effective cross-connection control program and the enforcement of the provisions of this Policy, or that person's designee.

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

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

Water Supply (approved) shall mean any public potable water supply that has been investigated and approved by FDEP. The system must be operating under a valid permit.

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, reclaimed water, industrial fluids, or any other type of water supply not controlled by the primary water purveyor.

Water Supply (unapproved) shall mean a water supply that has not been approved for human consumption by FDEP and/or is not operating under a valid permit.

Water System(s) (Customer's) shall include any plumbing and/or water system located on the Customer'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.

Water System(s) (Customer'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 Customer'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.

Water System (public) shall mean LCU's water supply system operated as a public water system under a valid permit from FDEP 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 use to produce, convey, treat, or store potable water for public consumption or use.

12.5 RECORDS, ENFORCEMENT, AND INSPECTIONS

A. Responsibility of LCU

LCU 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 Customer'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.

LCU 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 goal of LCU to require an approved cross connection control assembly installation at the premises of all Customers, unless otherwise exempted in this Policy. The Director shall require that each existing and future Customer, as specified below, have an approved cross connection control assembly installed in accordance with this Policy. The size of the assembly or device installed shall not be less than the size of the meter currently being used.

The Director shall designate the location of all cross connection control assemblies. Though the assembly shall typically be within 1 foot of the Customer's side of the water meter, or as otherwise approved by the Director, assemblies shall always be located on the premise of the Customer. When the location of an assembly requires that it be placed inside of a building or similar structure, an aluminum sign as detailed in Section 9 of this Manual and measuring 12 inches high by 18 inches long, shall be bolted to the wall a minimum of 24 inches above the point where the potable water service or fire line enters the building. The sign shall have a white background with black lettering stating "Cross Connection Control Device Located Inside".

The Director, bearing proper credentials and identification, shall be permitted to enter upon all properties for the purpose of sampling and testing of the water, or make inspections and observations of the connections to the public water supply system. Refusal to allow inspection of any water using equipment, plumbing or other cross connections shall cause the Director to discontinue water service and constitute a violation of this Policy.

As determined by LCU, cross connection control will be required for single-family and duplex residential customers only when there is an auxiliary water supply or swimming pool on site or when a cross connection or potential for a cross connection is found. This does not limit the authority of LCU to inspect single-family residential properties for the purpose of protecting the public water system.

In order to determine the degree of hazard to the public potable water system, Section 12.6 B below shall be used to determine the required assembly type that needs to be installed. As an alternative to the list, a survey may be made of the Customer's premises by LCU to determine the type of assembly needed. The survey need not be a detailed inspection of the location or disposition of the water lines, but can be confined to establishing the water uses on the premises, the existence of cross connections, and the availability of auxiliary or non-potable water supplies. Site inspections may be performed when deemed necessary by LCU to ensure compliance with this Policy.

B. New Construction

During the development review process, the Engineer shall utilize this Policy to determine the Customer's responsibilities concerning the installation of cross connection control assemblies or devices.

C. New Accounts on Existing Facilities

Upon application for water service by the Customer, the Customer shall be given a maximum of 90 calendar days from the date of application to have a cross connection control assembly or assemblies installed.

D. Retrofitting Facilities of Existing Customers

All existing Customers, unless otherwise exempted by this Policy, shall install the appropriate assembly or device within 180 calendar days of being notified by LCU. The Customer shall be notified as stated in Section 12.5C below.

Any existing assembly or device that has been correctly installed, regularly tested, and continues to function properly will be allowed to continue in service unless the degree of hazard is such as to supersede its effectiveness or results in an unreasonable risk to public health, as determined by LCU. In such a case, the customer shall replace or upgrade the assembly or device to the current standards of LCU.

E. Rebate Program for Existing Customers

Upon completion of the installation and successful testing of an approved new,

not replacement, cross connection control device in a accordance with this Policy on an existing water service, LCU will rebate to the customer up to approximately 1/2 of the cost, not to exceed the amount stated in the Schedule below, associated with retrofitting the water service for an assembly or device, which shall not include any costs for testing, and shall be on a first come first served basis until the current fiscal year's rebate program funds are depleted, unless otherwise approved by the Director.

MAXIMUM REBATE SCHEDULE BY DEVICE SIZE:

Device Size (Inches)	Maximum Rebate
¾	\$225.00
1 or 1 ¼	\$275.00
1 ½	\$350.00
2	\$450.00
2 ½	\$2,000.00
3	\$2,050.00
4	\$2,500.00
6	\$3,500.00
8	\$6,500.00
10	\$9,750.00

F. Responsibility of the Customer

The Customer has the primary responsibility of preventing contaminants and pollutants from entering his water supply system, and from entering the public water main or water source from his water supply system. The Customer shall protect his water supply system against actual or potential cross-connection, backflow, or back-siphonage, as required by this Policy, and other applicable regulations. The Customer shall assure that all assemblies and devices are tested and maintained in the working condition required. The Customer shall assure that all necessary permits are obtained for new water supply system installations and for alterations or repair to existing systems.

G. Records

Records concerning the installation and testing of an assembly or device shall be kept on-site by the Customer and accessible for review for a period of not less than 10 years. The Director shall be permitted reasonable access to these records during normal business hours, as required, for the purpose of monitoring compliance with this Policy. LCU shall maintain copies of all test reports, repair summaries, or other communications relating to this cross-connection control program for a period of not less than 10 calendar years in accordance with Rule

62-555, F.A.C.

H. Written Notice

The Director shall issue a written notice by certified mail when an approved cross connection control assembly or device is required at a Customer's water connection. Upon receipt of such written notice, the Customer shall install or have installed an approved cross connection control assembly or device at the sole expense of the Customer within the specified time from the date of Customer's receipt of the notification.

I. Violations

Failure, refusal, or inability on the part of the Customer to install an assembly or device shall constitute grounds for refusal of water or fire service or the discontinuance of service to the premises until such an assembly or device has been properly installed.

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, and this Policy regarding cross-connection control shall be considered in violation of the conditions for water service by LCU.

J. Enforcement Policy

No water service connection to any premises shall be installed or maintained by LCU unless the water supply is, or has received official development plan approval to be, protected as required by Federal, State, and Local Laws or Ordinances, and this Policy.

Water service to a Customer shall be discontinued by the Director if a cross connection control assembly required by this Policy is not installed, tested, and maintained, or if it is found that a cross connection control assembly has been removed, by-passed, or an unprotected cross-connection exists on the premises. Water service shall not be restored until such conditions or defects are corrected at the Customer's expense. Other methods of enforcement shall be used as appropriate, including, but not limited to, the County's Code Enforcement Procedures.

Certified Testers and Repairers shall be removed from their applicable lists for a minimum period of 1 year upon the third documented violation of this Policy and related requirements. All notifications of violation and suspension to each Tester

or Repairer generated by the Director shall be by certified mail.

K. Frequency

Due to changes in models or components of equipment, methods of manufacturing, and additions to plants, buildings, etc., water use requirements undergo continual change. As a result, new cross connections may be installed and existing protection may be bypassed, removed, or otherwise ineffective; therefore, an annual or biennial detailed inspection of all water usage is required. As a minimum, all assemblies and devices shall be tested by and at the expense of the Customer on an annual basis unless circumstances require a more frequent testing schedule

L. Costs

Any costs related to the disconnection or re-connection of water service, installation, maintenance, and/or testing of a device, other than that provided for in the rebate program, shall be the responsibility of Customer.

M. Auxiliary Water Supply

The public water system shall be protected against backflow and back-siphonage by the installation of an approved cross connection control assembly if an auxiliary water supply is found on the Customer's premises that may or may not be safe in bacteriological or chemical quality.

N. 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 back-siphonage. This protection shall include the installation of a cross connection control assembly in the service line. The type of cross connection control assembly installed shall be appropriate for the potential degree of hazard.

O. Internal Cross-Connections

If an internal cross-connection(s), undefined plumbing arrangement(s) exists, or if entry to all or portions of the premises is not readily accessible for inspection purposes, the public water supply system shall be protected against backflow and back-siphonage by the installation of a master meter assembly composed of an appropriate potable water meter and a cross connection control device at the point where the service line enters the subject premises.

The Director shall have the authority to require cross connection control devices in order to separate potential internal cross connections sources from any internal potable water supply source that the general public may use.

P. Reclaimed Water

Any property that is served by LCU's potable water system and also utilizes reclaimed water shall utilize a Cross Connection Control Device at the Customer's water service connection in accordance with this Policy.

All premises utilizing reclaimed water shall be required to provide LCU approved public notice signs at all entrances identifying the area as a reclaimed water use area. Non-irrigation users of reclaimed water shall provide similar notification signage at the point of reclaimed water use. All signage shall comply with Section 9 of this Manual.

12.6 DEGREE OF HAZARD AND TYPE OF PROTECTION

A. Degree of Hazard

The type of cross connection control assembly required shall depend upon the degree of hazard. The use of a detector meter as part of the assembly shall be required for all cross connection control assemblies of 2½ inches and above in size.

1. Non-Potable Water Supply

When an auxiliary water supply is present, the public water system shall be protected by an approved air-gap separation device or an approved reduced pressure principle assembly.

2. Objectionable, but Not Hazardous

When water or a substance(s) is present that would be objectionable if introduced into the potable water system but not hazardous to public health, the public water system shall be protected by an approved double check valve assembly.

3. Actual or Potential Hazard

Any material dangerous to health that is handled in such a fashion as to create an actual or potential hazard to the potable water system, the potable water system shall be protected by an approved air-gap separation device or an approved reduced pressure principle assembly.

B. Level of Protection

All controlled and uncontrolled cross-connections, either actual or potential, to the potable water system shall be protected by an approved air-gap separation or an approved cross connection control assembly. In the event of a conflict regarding the level of protection needed, the most protective assembly or device shall be utilized.

"DCDA" indicates an approved double check detector assembly. "RPDA" indicates an approved reduced pressure detector assembly. If the assembly is two (2) inches or smaller, a non-detector type assembly may be used. NOTE: As approved by the Director, a physical air-gap separation may take the place of a device.

<u>Type of Facility</u>	<u>Minimum Type of Protection</u>
Aircraft and Missile Storage/ Manufacturing Facility	RPDA
Automotive Repair or Manufacturing Facility	RPDA
Automotive Parts Stores (No Onsite Repairs)	DCDA
Automotive, Truck, and Boat Sales Businesses	RPDA
Auxiliary Water Systems	RPDA
Bakeries	RPDA
Barber Shops, Beauty Salons, Health Clubs, and Health Spas	RPDA
Beverage Bottling Facilities	RPDA
Breweries and Distilleries	RPDA
Canneries	RPDA
Car Wash Facilities	RPDA
Chemical Processing Storage or Manufacturing Facilities	RPDA
Chemical or Biological Testing Labs	RPDA
Chemically Contaminated Water Systems	RPDA
Cold Storage Facilities	DCDA
Commercial Rental Units(where use may vary w/ tenant)	RPDA
Convenient Stores	RPDA
Dairies	RPDA
Day Care Facilities (Children and Adult)	RPDA
Dental Offices and Laboratories	RPDA
Department Stores (No repairs or chemical storage)	DCDA
Department Stores (With repair facilities or chemical storage)	RPDA
Dry Cleaning and Laundry Facilities	RPDA

Electrical Transmission or Generating Facilities	RPDA
Fertilizer Storage and Manufacturing Facilities	RPDA
Film Processing Facilities	RPDA
Fire Protection Systems (No Additives)	DCDA
Fire Protection Systems (With Additives)	RPDA
Food Processing Facilities	RPDA
Government Facilities	
A.) Contamination Hazard	RPDA
B.) Pollution Hazard	DCDA
Hardware or Lumber Supply Stores	RPDA
Hospitals	RPDA
Hotels and Motels (Single Story Only)	DCDA
Hotels and Motels (Multi-Story)	RPDA
Ice Manufacturing Facilities	RPDA
Irrigation Systems	RPDA
Laboratories	RPDA
Laundries and Dye Works	RPDA
Machine Tool Manufacturing Facilities	RPDA
Manufacturing Facilities(non-toxic substances on-site)	DCDA
Manufacturing Facilities (toxic substances on-site)	RPDA
Marinas and Boat Docks	RPDA
Master Metered Premises	RPDA
Medical Facilities	RPDA
Medical Clinics	RPDA
Metal Manufacturing, Cleaning, and Fabricating Facilities	RPDA
Morgues or Mortuaries	RPDA
Motion Pictures Studios	RPDA
Multi-Family Structures	
with 3 Units or More on One Meter	RPDA
Multiple Services that are Interconnected	RPDA
Multi Story Buildings (Multi-Family or Commercial)	RPDA
Nursing Homes and Rehabilitation Facilities	RPDA
Office Buildings (Single Story Only)	DCDA
Office Buildings (Multi-Story)	RPDA
Office Units (Single Story Only)	DCDA
Oil and Gas Production or Storage Facilities	RPDA
Packing Houses or Rendering Facilities	RPDA
Paper and Paper Products Facilities	RPDA
Pest Exterminating Businesses	RPDA
Pharmaceutical or Cosmetic Facilities	RPDA
Photo Processing Facilities	RPDA
Photograph Studios	RPDA
Plastic Injection and Molding Facilities	RPDA
Plating Facilities	RPDA

Ponds or Similar Appurtenances	RPDA
Power Plants	RPDA
Premises where Inspections are Restricted	RPDA
Premises with Boilers	RPDA
Premises having a Water Storage Tank or Reservoir	RPDA
Reclaim Water Usage at Single Family Residential Premises	DCDA
Reclaim Water Usage at all other Premises	RPDA
Restaurants and other Food Preparation Establishments	RPDA
Restricted, Classified, or Closed Facilities	RPDA
Retail Businesses (Single Story Only)	DCDA
Rubber Processing Plants, Natural or Synthetic	RPDA
Sand and Gravel Processing Facilities	RPDA
Schools and Colleges	RPDA
Sewage and Stormwater Collection and Pumping Facilities	RPDA
Solar Heating Systems	RPDA
Strip Malls and Centers	RPDA
Super Markets and Grocery Stores	RPDA
Swimming Pools and Club Houses	RPDA
Veterinary Establishments	RPDA
Warehouse and Storage Facilities	RPDA
Waterfront Facilities and Industries	RPDA

C. Fire Protection Systems

All fire protection system service lines shall have an approved double check detector assembly installed on the premises prior to the connection point with the potable water system. Mains specifically for private fire hydrants shall have an approved double check detector assembly installed on the premises prior to the connection point with LCU's potable water system. A fire protection system, which incorporates chemical additives, shall have an approved reduced pressure detector assembly installed on the premises prior to the connection point with the potable water system.

D. Assessment of Hazard and Protection for Internal Protection

NOTE: H = Health Hazard, NH = Non-Health Hazard, AG = air-gap, AVB = atmospheric vacuum breaker, DCVA = double check valve assembly, PVBA = pressure vacuum breaker, and RPPA = reduced pressure principle assembly.

<u>Description of Cross Connection</u>	<u>Assessment of Hazard</u>	<u>Recommended (+) Assembly @ Fixture</u>
Aspirator	H	AVB or PVBA
Bedpan Washers	H	AVB or PVBA

Autoclaves	H	RPPA
Specimen Tanks	H	AVB or PVBA
Sterilizers	H	RPPA
Cuspidors	H	AVB or PVBA
Lab Bench Equipment	H	AVB or PVBA
Autopsy and Mortuary Equip.	H	AVB or PVBA
Sewage Pumps	H	AG
Sewage Ejectors	H	AG
Fire-fighting Systems		
w/ Toxic Liquid Foam Concentrates	H	RPPA
Connection to Sewer Pipes	H	AG
Connection to Plating Tanks	H	RPPA
Connection to Salt Water		
Cooling Systems	H	RPPA
Tank Vats or other Vessels		
Containing Toxic Substance	H	RPPA
Dye Vats or Machines	H	RPPA
Cooling Towers		
w/ Chemical Additives	H	RPPA
Trap Primers	H	AG
Steam Generators	NH*	RPPA
Heating Equipment		
Commercial	NH*	RPPA
Domestic	NH*	DCVA
Irrigation Systems	H*	RPPA
Irrigation Systems		
w/ Chemical Additives or Agents	H*	RPPA
Swimming Pools		
Public	NH*	RPPA or AG
Private	NH*	PVBA or AG
Vending Machines	NH*	RPPA or PVBA
Ornamental Fountains	NH*	DCVA, AVB, or PVBA
Degreasing Equipment	NH*	DCVA
Lab Bench Equipment	NH*	AVB or PVBA
Hose Bibs	NH*	AVB
Trap Primers	NH*	AVB
Flexible Shower Heads	NH*	AVB
Steam Tables	NH*	AVB
Washing Equipment	NH*	AVB
Shampoo Basins	NH*	AVB
Kitchen Equipment	NH*	PVBA
Aspirators	NH*	AVB
Domestic Space-Heating Boiler	NH*	RPPA

(+) AVB's and PVBA's may be used to isolate health hazards under certain conditions, that is, backsiphonage situations. Additional area or premises isolation will be required.

(*) Where a greater hazard exists (due to toxicity or other potential health impact) additional area protection with RPPA's will be required.

12.7 PREMISES WITH RESTRICTED ACCESS

Any premises where security requirements or other prohibitions or restrictions exist and it is impossible or impractical to make a complete in-plant cross-connection survey, the potable water system shall be protected against backflow or backsiphonage by the installation of an approved cross connection control assembly. Maximum protection will be required for restrictive premises. An approved air-gap separation or an approved reduced pressure principle cross connection control assembly shall be installed in each service to these premises.

12.8 APPROVAL, TESTING, AND REPAIRS

A. Approved Assemblies

A List of Approved Cross Connection Control Devices shall be maintained by LCU and provided upon request to any interested parties. Assemblies and devices that are considered not to be easily maintained and repairable in the opinion of LCU shall not be considered for approval.

An approved cross connection control assembly or device shall be both manufactured in full conformance with the standards established by the AWWA entitled: AWWA C505-69 "Standards for Reduced Pressure Principle and Double Check Valve Assemblies", or later adopted version and conform with the laboratory and field performance specifications of the FCCCHR. All assemblies and devices must comply with both of the above standards, not one or the other.

All approved cross connection control assemblies shall also be in compliance with the standards set forth by the following agencies:

FDEP - Rule 62-555.360 and 62-555.335 F.A.C.

ASSE

State Standard Plumbing Code

B. Testing

It shall be the duty of the Customer at any premise where cross connection control assemblies are installed to have certified inspections and operational tests made at least once per year. Customers will be notified by mail approximately 30 calendar days in advance of the required testing due date. In those instances where the Director deems the hazard to be exceptional, additional certified inspections may be required at more frequent intervals. These inspections and tests shall be at the expense of the Customer and shall be performed by a Certified Tester, pre-approved by the Director, using certified test gauges. A List of Certified Testers and Repairers shall be maintained by LCU and made available to the general public. In addition to the submittal of proof of certification in the appropriate area of specialization from a LCU approved agency located within the State, all Certified Testers and Repairers shall attend an Orientation Class conducted by LCU prior to having their names placed on the above mentioned List and conducting business as a Certified Tester or Repairer within LCU's service area.

LCU reserves the right as authorized by separate resolution or ordinance as approved by the Board to establish at any time an in-house cross connection control device testing program utilizing either its employees or contracted testing services to test all devices of all Customers on a cost recovery basis.

Before each field test the Certified Tester shall take the following steps:

1. Notify the Customer that the water service will need to be shut-off during the test. If a fire protection system will be affected, the Director and the Fire Chief of the Local Fire Station shall also be notified. Testing shall be coordinated with the Customer.
2. Identify that the proper assembly is being tested by checking the identification tag and meter number.
3. Inspect the assembly for minimum clearances and properly located shut off valves and test cocks.
4. Observe the assembly and surroundings for signs of leakage, vandalism, or alterations.

After each field test the Certified Tester shall supply the owner and the Director with a copy of the County approved Test and Maintenance Report within 7 calendar days, or a retest will be required.

1. Test Requirements for RPPA's and RPDA's

Test 1. The operation of the pressure differential relief valve shall maintain a zone between the two check valves at least 2 psi less than the supply pressure.

Test 2. The number 2 shut-off valve shall close fully and be leak tight against backpressure and back siphonage.

Test 3. The number 2 check valve shall maintain a static pressure drop across the check valve of at least 1 psi in the direction of flow. The check valve shall permit no leakage in a direction reverse to the normal flow.

Test 4. The number 1 check valve shall maintain a static pressure drop across the check valve of 3 psi or greater than the recorded opening point of the relief valve. The check valve shall permit no leakage in a direction reverse to the normal flow.

2. Test Requirements for DCVA's and DCDA's

Test 1. The number 1 and number 2 shut off valves shall close fully and be leak tight.

Test 2. The number 1 check valve shall maintain a static pressure drop across the check valve of at least 1 psi in the direction of flow. The check valve shall permit no leakage in a direction reverse to the normal flow.

Test 3. The number 2 check valve shall maintain a static pressure drop across the check valve of at least 1 psi in the direction of flow. The check valve shall permit no leakage in a direction reverse to the normal flow.

Testing double check valve assemblies with limited access installations may require the down stream reference point being raised with a sight tube to an elevation level with the test gauge.

3. Test Requirements for PVBA's

Test 1. The number 1 shut-off valve shall close fully and be leak tight.

Test 2. The air inlet valve shall open when the pressure in the body is no less than 1 psi above atmospheric pressure. The air inlet valve shall be fully open when the water drains from the body.

Test 3. The check valve shall maintain a static pressure drop across the check valve of at least 1 psi in the direction of flow.

C. Repairs

It shall be the duty of the Customer to conform to scheduled testing. If deficiencies are noted during the test, such assemblies shall be repaired, overhauled, or replaced at the expense of the Customer by a Certified Cross Connection Control Assembly Repairer pre-approved by the Director. If an existing assembly needs to be repaired or overhauled, only original manufacturer parts shall be used.

If an existing assembly needs to be taken out of line for repairs, the assembly and installation shall meet all current policies, standards, and specifications as set forth in this Policy, before it is put back into service.

If an existing assembly or device needs to be replaced, the Customer shall contact the Director before any work is done. At this time the assembly or device with its associated piping, valves, and fittings shall be brought up to current standards and specifications. The Tester and Repairer shall furnish records of such tests, repairs, and overhauls to the Director and Customer. Upon completion of any repair, over haul, or replacement of an assembly or device, an operational test shall be made before the system is put back into service.

12.9 INSTALLATION

All cross connection control assemblies and devices shall be installed in strict accordance with the manufacturer's installation instructions and the following guidelines. All cross connection control assemblies and devices shall be installed by the Customer or a plumbing contractor authorized to do business in the County. All required permits shall be obtained prior to the start of any installation. The installation of assemblies and devices over 2½ inches in diameter shall require a pre-construction conference with LCU. The installation of all assemblies and devices shall comply with Section 9 of this Manual, which depicts the installation of specific cross connection control assemblies. Due to the inherit water pressure loss across an Assembly, the maximum design water pressure for all proposed developments requiring the installation of a cross connection control device shall be a residual pressure of 30 p.s.i. on the Customer's side of the Assembly. In addition, all installations shall conform to the following minimum requirements:

A. Location

The Director shall designate the location of all cross connection control

assemblies. Though the assembly shall typically be within 1 foot of the Customer's side of the water meter, or as otherwise approved by the Director, assemblies shall always be located on the premise of the Customer. When the location of an assembly requires that it be placed inside of a building or similar structure, an aluminum sign as detailed in Section 9 of this Manual and measuring 12 inches high by 18 inches long, shall be bolted to the wall a minimum of 24 inches above the point where the potable water service or fire line enters the building. The sign shall have a white background with black lettering stating "Cross Connection Control Device Located Inside". All assemblies that are subject to potential contact with vehicular traffic shall be protected by the installation of bollards constructed and installed in accordance with this Manual.

B. Support

All assemblies and devices shall be adequately supported to prevent the assembly from sagging.

C. Flushing

Pipelines shall be thoroughly flushed to remove foreign material and debris before installing the assembly.

D. Reduced Pressure Principle Assembly

The RPPA (or RPDA) shall be installed in a horizontal position unless otherwise recommended by this Policy or approved by the Director. The Assembly shall not be installed in a pit. If installed in an enclosure, the enclosure shall be provided with an adequate gravity drain to a positive outfall and an air gap between the relief valve port on the Assembly and the positive outfall drain or the maximum flood level in the enclosure, whichever is highest. If the Assembly is installed inside a building, an adequate drain shall be provided and there shall be an air gap between the relief valve port on the Assembly and the drain or the maximum flood level in the building, whichever is highest. To facilitate testing and maintenance, the bottom of the Assembly, 2 inches and smaller in diameter, shall be located a minimum of 12 inches and a maximum of 18 inches above the ground or floor. Assemblies measuring 2½ inches and larger in diameter shall not be less than 18 inches or more than 36 inches above the ground or floor. The side of the Assembly with the test cocks shall be located a minimum of 24 inches from the nearest fixed wall or obstruction. All other sides of the Assembly shall be located a minimum of 12 inches from the nearest fixed wall or obstruction.

E. Double Check Valve Assembly

The DCVA (or DCDA) shall be installed in a horizontal position unless otherwise

recommended by this Policy or approved by the Director. If the Assembly is installed in an enclosure or building, adequate drainage shall be provided to maintain a dry location. If the Assembly is installed in a location susceptible to flooding, the Assembly shall be of the top entry type and the test cocks on the Assembly shall be plugged. To facilitate testing and maintenance, the bottom of the Assembly, 2 inches and smaller in diameter, shall be located a minimum of 12 inches and a maximum of 18 inches above the ground or floor. Assemblies measuring 2½ inches and larger in diameter shall not be less than 18 inches or more than 36 inches above the ground or floor. The side of the Assembly with the test cocks shall be located a minimum of 24 inches from the nearest fixed wall or obstruction. All other sides of the Assembly shall be located a minimum of 12 inches from the nearest fixed wall or obstruction.

F. Pressure Vacuum Breaker Assembly (Internal Use Only)

The PVBA shall be installed in a vertical position unless otherwise recommended by this Policy or approved by the Director. The critical level or bottom of the Assembly shall be installed at least 12 inches above all downstream piping and water outlets. If the Assembly is installed in an enclosure or building, adequate drainage shall be provided. To facilitate testing and maintenance, all sides of the Assembly shall be located a minimum of 12 inches from the nearest fixed wall or obstruction.

G. Atmospheric Vacuum Breaker Device (Internal Use Only)

The AVB Device shall be installed in a vertical position unless otherwise recommended by this Policy or approved by the Director. The critical level or bottom of the Device shall be installed at least 12 inches above all downstream piping and water outlets. There shall be no downstream valves or shutoffs and shall not be installed where it will be in continuous operation for more than 12 hours. If the Device is installed in an enclosure or building, adequate drainage shall be provided. To facilitate testing and maintenance, all sides of the Device shall be located a minimum of 12 inches from the nearest fixed wall or obstruction.

H. Concrete Pads

Concrete pads shall be poured under all cross connection control assemblies and devices greater than 2 inches that are installed outside. The width of the pad shall be a minimum of 24 inches, or shall extend at least 12 inches beyond the widest point on all sides of the assembly or device, whichever is greater. The length of the pad shall be 12 inches longer on both ends than the length of the entire assembly, which shall include the point where each pipe enters the ground. Adequate reinforcing using 6 inch by 6 inch 10 gauge wire mesh and/or No. 5

steel reinforcement bars shall be used and all piping passing through the pad shall be sleeved. The minimum thickness the pad shall be 4 inches and the minimum strength of the concrete shall be 3000 psi.

1. Painting and Color Coding

All cross connection control devices, assemblies, and associated piping, valves, and fittings shall be painted and color-coded to protect the devices and for identification. Meters shall not be painted.

Potable Water Systems	Blue
Fire Protection Systems	Red
Reclaimed Water Systems	Purple
Wastewater Systems	Green

If approved by the Director, the color Black may be substituted for the color Blue on a case by case basis for esthetic purposes.

All exterior paint used shall be long lasting and ultra-violet radiation stabilized to prevent fading. Each assembly and device shall be repainted during its annual test as a minimum.

J. Pipe and Fittings

All piping and fittings 2 inches and smaller in diameter shall be sweated copper or threaded brass from the point where the bend fitting leaves the Customer's service line underground on the upstream side of the assembly to the point where the bend fitting meets the Customer's service line underground on the downstream side of the assembly. Dielectric unions shall be used on all installations.

All piping and fittings 2½ inches and larger in diameter shall be flanged ductile iron from the point where the bend fitting leaves the Customer's service line underground on the upstream side of the assembly to the point where the bend fitting meets the Customer's service line underground on the downstream side of the assembly. Restraining of joints shall be accomplished as appropriate.

K. Existing Systems

Prior to the installation of a new or upgraded cross connection control assembly or device on an existing fire protection or plumbing system, the Director shall be notified by the Customer.

1. Fire Systems

The Fire Chief of the Local Fire Station shall be notified and the hydraulics of existing fire protection systems shall be checked by a registered professional engineer or certified fire protection system contractor before the installation of a new or upgraded cross connection control assembly is installed.

2. Plumbing

The existing plumbing system shall be inspected, and repaired as necessary, to insure that all thermal expansion devices and/or pressure relief valves on all water heaters and other equipment are functioning properly, or installed per the State Standard Plumbing Code, prior to and immediately after the completion of the assembly's installation.

3. Potential Pressure Loss

As cross connection control assemblies or devices may result in a water pressure reduction of approximately 7 to 14 psi, water pressures at peak usage times shall be observed by the Customer prior to and after the installation. If the resulting pressures are not acceptable to the Customer for whatever reason, then the Customer may install pressure booster pumps at the Customer's expense.