(4) Alarm System. An alarm system shall be provided which will send a visual or audible signal to a constantly monitored location so that the water system operator will be advised of a primary power failure.

History Note: *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
Eff. January 1, 1977;
Readopted Eff. December 5, 1977;
Amended Eff. July 1, 1994; September 1, 1990; October 1, 1986; June 30, 1980.

.0406 DISTRIBUTION SYSTEMS

(a) Water Pipe Materials. Distribution mains shall be cast iron, ductile iron, asbestos-cement, reinforced concrete, plastic or other material designed for potable water system service and shall be the appropriate AWWA standards, section C, or NSF Standards No. 14 and No. 15, which is adopted by reference in accordance with G.S. 150B-14(c) or approved equal standards. Copies of AWWA standards are available from the American Water Works Association, 6666 W. Quincy Avenue, Denver, Colorado 80235. Copies of NSF standards are available from the National Sanitation Foundation, NSF Building, Ann Arbor, Michigan 48105. Copies are available for public inspection at the principal address of the Division. The pressure rating class of the pipe shall be in excess of the maximum design pressure within that section of the water distribution system. The quality of pipe to be used shall be stated in the project specifications.

(b) Cross-Connections

(1) No potable water supply shall be connected by any means whatever to another source of water supply or to a storage facility unless such connection has been previously approved by the Division. No connection shall be made to any plumbing system that does not comply with the North Carolina State Building Code, volume II, or any applicable local plumbing code.

(2) No person shall introduce any water into the distribution system of a public water supply through any means other than from a source of supply duly approved by the Department or its representatives, or make a physical connection between an approved supply and unapproved supply unless authorized in an emergency by the Department or its representative.

(3) In cases where storage capacity is used only for non-potable purposes and there is installed either an elevated tank or a ground reservoir, the following precautions shall be taken:

(A) When the reservoir or elevated tank is filled from a supply other than a public water supply and the public water supply is used as a supplemental supply, the pipeline from the public water supply shall be installed in such a manner that the water will be discharged over the top or rim of the reservoir or elevated tank. There shall be a complete physical break between the outlet end of the fill pipe and the top or overflow rim of the tank or reservoir of at least twice the inside diameter of the inlet pipe.

(B) When the elevated tank or ground storage reservoir is filled entirely by water from a public water supply:

(i) If a covered ground reservoir or covered elevated storage tank is used, an approved reduced pressure back-flow preventor or an approved double check valve assembly may be used. The back-flow prevention device shall be installed in such a manner as to afford adequate protection and shall be easily accessible and shall include all necessary pressure gauges and drains for testing. Gate valves shall be installed in the line at both ends of the back-flow prevention device.

(ii) If an uncovered ground reservoir or uncovered elevated storage tank is used, a complete physical break shall be provided between the reservoir or elevated tank and the public supply. The physical break between the inlet pipe and the top or overflow rim of the reservoir shall be at least twice the diameter of the inlet pipe.

(4) All cross-connections between potable water supplies and non-potable or unprotected supplies which are not specifically covered in the categories in this Paragraph will be considered as special problems and the protective devices required will be determined by the Department on the basis of the degree of health hazard involved.

(5) Persons desiring to install non-potable water supplies in conjunction with a public water supply shall submit to the public water supply section, Division of Environmental Health, detailed plans and specifications in triplicate showing the non-potable water supply and its relation to the potable water supply.

(6) Any such interconnection to a potable water system is subject to the approval of the water supplier and shall not be made until authorized by the water supplier in addition to the Department.

(7) No person shall fill special use tanks or tankers containing pesticides, fertilizers, other toxic chemicals or their residues from a public water system except at a location equipped with an over-the-rim free discharge of water or an approved reduced pressure backflow preventer properly installed on the public water supply. No supplier of water shall permit the filling of such special use containers except at locations so equipped.

History Note: *Authority G.S. 130A-315; 130A-317; P.L. 93-523;*
Eff. January 1, 1977;
Readopted Eff. December 5, 1977;
Amended Eff. September 1, 1990; December 1, 1988; June 30, 1980.

FIGURE 2: NORTH CAROLINA GUIDELINES CROSS CONNECTION CONTROL IN WATER DISTRIBUTION SYSTEMS

These guidelines are supplemental to Section .0406(b). These guidelines are intended as a minimum requirement. Public water suppliers may adopt more stringent requirements. Each supplier of water shall conform to the minimum requirements established in these guidelines.

I. Degree of Hazard:

A. Severe: Actual or potential threat of contamination that presents an imminent danger to the public health with consequence of serious illness or death.

B. Moderate: One that presents foreseeable and significant potential for pollution, nuisance, aesthetically objectionable or other undesirable alterations of the drinking water supply.

II. Backflow Prevention Assembly Requirements:

Degree of hazard	RPZ*	DCVA**	Air Gap
Severe	X	-------	X
Moderate	------	X	-------

* Reduced pressure zone
** Double check valve assembly
*** This is not intended to be an exhaustive list

III. Facilities that Require Installation of a Backflow Preventer***:

A. Moderate hazard - DCVA:

1. Fire sprinkler systems without booster pump facilities or chemical additives.
2. Connection to tanks, lines and vessels that handle non-toxic substances.
3. Most commercial establishments.
4. Automatic service stations, bakeries and beauty shops with no health hazard and bottling plants with no back pressure.
5. etc.

B. Severe hazard - RPZ or air gap:

1. Lawn sprinkler systems
2. Wastewater treatment plants
3. Connection to an unapproved water system or unapproved auxiliary water supply
4. Connection to tanks, pumps, lines, steam boilers or vessels that handle sewage, lethal substances, toxic or radioactive substances
5. Fire sprinkler systems with booster pump facilities (such as fire department connections [FDCs]) or chemical additives
6. Buildings with five or more stories above ground level
7. Hospitals and other medical facilities
8. Morgues, mortuaries and autopsy facilities
9. Metal plating facilities
10. Bottling plants (subject to back pressure)
11. Canneries
12. Battery manufacturers
13. Exterminators and lawn care companies
14. Chemical processing plants
15. Dairies

16. Film laboratories
17. Car wash facilities
18. Dye works
19. Laundries
20. Swimming pools
21. Water front facilities
22. etc.

IV. Approved Backflow Prevention Assemblies:

Meets American Society of Sanitary Engineering (ASSE) standard and carries ASSE seal or is on the University of Southern California approval list.

V. Backflow Prevention Assembly Installation:

Backflow prevention assemblies must be located in a place where it is readily accessible for regular testing, maintenance and inspection. Bypass lines parallel to a backflow prevention assembly shall have an approved backflow prevention assembly installed that is equal to that on the main line.

A. RPZ:

1. Above ground installation preferred.
2. Below ground vault shall have positive drainage with adequate gravity drainage to atmosphere.
3. 12 inches minimum clearance from vault walls and floor.
4. Installation in accordance with manufacturer's recommendations.

B. DCVA:

1. Vertical or horizontal installation acceptable.
2. Adequate drainage shall be provided if installed below ground.