Brick

Permit Without a Jacket

Permit Number B-1056

LDS BR 10110229

Construction Permit # B-1056

Aug. 10, 19 82

Owner: Caldor, Inc.

Location: Chambersbridge Rd. & Rt. 70

Laurelton

C/O 2888A

Block: 701 Lot: 8, pt. 9

3-30-83

Contractor: Same

Fee $: 2,265.63 ck. Use: Comm. Alt.

201-636-5400 — Parvin

201-4000 —

Caldor — 539-3900

462-4700 - Shop

773-4000

Over

BUILDING SUB-CODE INSPECTIONS

Footing Trench 8/12/82

Slab

Foundation

Framing

Insulation

Final

C. O. Issued

VIOLATIONS

(773-4000)

10-29-82

330 — 11-29-82

PLUMBING SUB-CODE INSPECTIONS

Slab 7/22/82 - 7/27/82 D.M.

Rough 8/3/82 D.M.

Septic/Sewer

Water

Final 3/30/83 D.M.

Electrical Final

11-29-82

Use reverse side for additional remarks

Certificate of Occupancy

Name Vornado, Inc. - Caldors

THIS IS TO CERTIFY that the building erected at Chambers Bridge Road & Rt. 70 Lot No. 8, pt 9 Block No. 701 in Brick Township, under Permit No. B-1056 issued August 10, 19 82, has been inspected and approved in accordance with the Zoning and Building Ordinances of the Township of Brick.

Use Group M — Maximum Live Load _____

Fire Grading 3 hours — Occupancy Load _____

By the issuance of this certificate, neither the Township nor any of its officers or employees assumes any liability, either express or implied, in connection therewith.

2988 A

Arthur J. Cayo
CONSTRUCTION OFFICIAL

Date March 30, 1983

Vornado INC.
174 PASSAIC STREET
GARFIELD, N.J. 07026
201-773-4000

March 24, 1983

Mr. Arthur J. Cierzo
Construction Offical
Township of Brick
401 Chambersbridge Road
Brick, New Jersey 08723

RE: CALDORS/SHOP RITE, BRICKTOWN, NEW JERSEY

Dear Mr. Cierzo:

We hereby request a final Certificate of Occupancy for both Shop-Rite and Caldors at the above captioned locations.

Your cooperation is greatly appreciated.

Sincerely,

VORNADO, INC.

M. Scarpa

Morris Scarpa
Real Estate Coordinator

MS/rpe

Township of Brick

401 Chambers Bridge Road, Brick, N.J. 08723 (201) 477-3000

Office of
Division of Inspections

APPLICATION FOR VARIATION (N.J.A.C. 5:23-2.4)

Date Filed 3/17/83 Plan Number Permit #963

Project Name & Location Shop-Rite --- Caldor's

Owner's Name & Address Vornado Inc. - 174 Passaic St., Garfield, N.J.

Architect's Name & Address Morris Waitz, 20 Glorie Ave., Norwalk Conn.

Building Use Group (s) M Building Construction Classification Merchantile 2 A

Building Height in Stories 1 Total Gross Area (One Building) 50,996 - ~~39,683~~ 87,667

The owner of the above premises hereby applies for a variation to Section AWWA-10

of the 5:23-2.4 Subcode of the New Jersey Uniform Construction Code.

1. Requirements from which variation is sought:

2. Manner in which strict compliance would relult in practical difficulties:

3. Nature and extent of practical difficulties:

4. Proposed alternative to requirements (attach architect's drawing):

Mario Scarpa
Owner or Agent's Signature Vornado INC
3-24-83

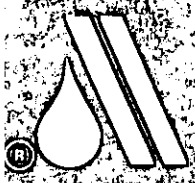
[x] Approved

Sub-Code Official _____

Construction Official _____

Art Cierzo

AWWA NO. M14



Backflow Prevention and Cross-Connection Control

AMERICAN WATER WORKS ASSOCIATION

MANUAL OF WATER SUPPLY PRACTICES

Recommended Practice for

Backflow Prevention and Cross-Connection Control

AWWA Manual M14

AMERICAN WATER WORKS ASSOCIATION
6666 West Quincy Avenue, Denver, Colorado 80235

1966

Prepared by Committee 8210 J

AMERICAN WATER WORKS ASSOCIATION
CONFERENCE OF STATE SANITARY ENGINEERS

Committee Personnel, 1966

GUSTAVE J. ANGELE SR., *Chairman*

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E. J. ALLEN
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CSSE Representatives

W. N. GAHR
P. J. HOUSER
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H. J. ONGERTH
H. E. WIRTH

Bibliography 1970

Recommended Practice for Backflow Prevention and Cross-Connection Control

Sec. 1—General

THE general concept and much of the technical material in this manual are derived from the "Manual of Cross-Connection Control Recommended Practice" of the Southern California Water Utilities Association, edited and published by the Research Foundation for Cross-Connection Control of the University of Southern California.

There is no generally accepted standard practice for the protection of potable water supplies from nonpotable supplies. Laws and regulations of states and local agencies vary widely. This manual is intended to supplement, not supersede, local laws and regulations.

Sec. 2—Objectives

The purpose of this manual is to provide water purveyors and other persons responsible for public potable water supply systems with a guide to procedures for:

2.1. Protecting these supplies against contamination or pollution resulting from backflow of objectionable fluids through cross connections. (Local government authorities and water purveyors may establish requirements more rigid than those indicated.)

2.2. Protecting these supplies at the service connection by isolating within the consumer's premises pollution or contamination that may result from backflow through cross connections.

2.3. Providing means whereby an industrial consumer may utilize a separate system for his industrial uses so as to prevent possible pollution or contamination of his internal potable-water system.

Sec. 3.—Definitions

3.1 Air gap separation means the unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet supplying water to a tank, plumbing fixture, or other device and the flood level rim of the receptacle. An "approved air gap separation" shall be at least double the diameter of the supply pipe measured vertically above the top rim of the vessel—in no case shall the gap be less than 1 in.

3.2. Approved. The term "approved" as herein used in reference to a water supply system or backflow prevention device (or method) shall mean one that has been approved by the appropriate regulatory agency (*see* "Health agency" below).

3.3. Auxiliary supply means any water source or system, other than the public water supply, that may be available in the building or premises.

3.4. Backflow means the flow of any foreign liquids, gases, or substances into the distributing pipe lines of a potable supply of water. Backflow may occur under two conditions—pressure greater than atmospheric (*see* "Back pressure," below), and pressure that is subatmospheric (*see* "Back siphonage," below).

3.5. Backflow prevention device, approved means a device that has been investigated and approved by the health agency and water purveyor having jurisdiction. (Approval of the device may be left to the water purveyor at the discretion of the regulatory agencies.)

3.6. Backflow prevention device, type means any effective device, methods, or type of construction used to prevent backflow into a potable-water system.

3.7. Backflow prevention device tester, certified means a person who is qualified to test backflow prevention devices and has proven his competency to the satisfaction of the appropriate regulatory agency.

3.8. Back pressure means backflow caused by a pump, elevated tank, boiler, or other means that could create pressure within the system greater than the supply pressure.

3.9. Back siphonage means a form of backflow due to a negative or subatmospheric pressure within a water system.

3.10. Check valve, approved—this term, as used in cross-connection control, means a check valve of substantial construction and suitable materials that is positive in closing and permits no leakage in a direction reverse to the normal flow.

3.11. Consumer means the owner or operator of a private potable-water system served by a public potable-water system.

3.12. Contamination (*see* "Pollution").

3.13. Cross connection means any connection or structural arrangement between a public or a consumer's potable-water system and any nonpotable source or system through which backflow can occur (*see* "Backflow," above). (Bypass arrangements, jumper connections, removable sections, swivel or change-over devices, and other temporary or permanent devices through which, or because of which, backflow can occur are considered to be cross connections.)

3.14. Cross connection, point of means the specific point or location in a public or a consumer's potable-water system where a cross connection exists.

3.15. Double check valve assembly, approved means an assembly composed of two single, independently acting, "approved check valves," including tightly closing shutoff valves located at each end of the assembly and suitable connections for testing the watertightness of each check valve.

3.16. Hazard, degree of expresses the results of an evaluation of a health, system, or plumbing hazard.

3.17. Hazard, health means any condition, device, or practice in a water supply system and its operation that

creates, or may create, a danger to the health and well-being of a consumer.

3.18. Hazard, plumbing means a cross connection in a consumer's potable-water system that may permit back siphonage in the event of a negative pressure in the supply line. (Unprotected plumbing-type cross connections are considered to be health hazards. They include, but are not limited to, faulty connections to fixtures such as toilets, sinks, tubs, lavatories, wash trays, and domestic washing machines.)

3.19. Hazard, system means a threat to the physical properties of the public or the consumer's potable-water system or of a material not dangerous to health but aesthetically objectionable that would have a degrading effect on the quality of the potable water in the system.

3.20. Health agency means the health authority having jurisdiction.

3.21. Industrial fluids means any fluid or solution that may chemically, biologically, or physically degrade the approved water supply.

3.22. Industrial line means a separate water piping system serving water-using devices, with a backflow preventer or air gap separation on this line at the point of takeoff from the potable-water line.

3.23. Industrial piping system, consumers means a system used by a consumer for transmission or storage of anything (fluid, solid, or gas) other than the water supply intended or used for human consumption or food processing. (Such a system would include all pipes, conduits, tanks, receptacles, fixtures, equipment, and appurtenances used to produce, convey, or store substances that are or may be polluted.)

3.24. Laboratory, approved testing means one that is approved by the appropriate health agency and water purveyor and is properly staffed and equipped with pumps, meters, measuring devices, and other equipment to test and evaluate fully a backflow prevention device for design, materials, construction, and operation. (Approval of the laboratory may be left to the water purveyor at the discretion of the health agency.)

3.25. Nonpotable water means water not safe for drinking, personal, or culinary use.

3.26. Point of delivery (*See* "Service connections," below).

3.27. Pollution means the presence in water of any foreign substance (organic, inorganic, radiologic, or biologic) that tends to degrade its quality so as to constitute a hazard or to impair its potability or usefulness.

3.28. Potable water means water that is safe for drinking, personal, or culinary use.

3.29. Reduced-pressure-principle backflow prevention device means a device containing a minimum of two independently acting, approved check valves, together with an automatically operated pressure differential relief valve located between the two check valves. During normal flow and at the cessation of normal flow the pressure between these two checks shall be less than the upstream (supply) pressure. In case of leakage of either check valve, the differential relief valve, by discharging to the atmosphere, shall operate to maintain the pressure between the checks at less than the supply pressure. The unit must include tightly closing shutoff valves located at each end of the device, and each device shall be fitted with properly located test cocks.

3.30. Service connection means the terminal end of a service from the pub-

lic potable-water system—that is, where the water purveyor loses jurisdiction and sanitary control over the water at its point of delivery to the consumer's water system. If a meter is installed at the end of the service connection, then the service connection means the downstream end of the meter.

3.31. Water delivered (*delivered water*) shall mean any water supplied by a water purveyor from a public potable-water system to a consumer's water system after it has passed the point of delivery and is no longer under the sanitary control of the water purveyor.

3.32. Water purveyor means the owner or operator of a public potable-water system.

3.33. Water supply, approved means any public or consumer's potable-water supply that has been investigated and approved by the health agency having jurisdiction.

3.34. Water supply, unapproved means a water supply that is not approved by the health agency having jurisdiction.

3.35. Water system, consumer's means any water system, potable or nonpotable, located on the consumer's premises, whether supplied by a public potable-water system or an auxiliary water supply.

3.36. Water system, public potable means any publicly or privately owned domestic water system operated under public-health supervision. Such a system includes all sources, facilities, and appurtenances between the source and the point of delivery, such as valves, pumps, pipes, conduits, tanks, receptacles, fixtures, equipment, and appurtenances used to produce, convey, treat, or store a potable water for public consumption or use.

3.37. Water supervisor means the consumer or his deputy charged with the responsibility of maintaining a consumer's water system free from cross connections and other sanitary defects. (A certified backflow prevention device tester should not act as a water supervisor unless he is a full-time employee of the consumer, having the day-to-day responsibility for the installation and use of pipelines and equipment on the premises and for the avoidance of cross connections.)

Sec. 4—Administrative Responsibilities

Responsibility for cross-connection control rests with the water purveyor, the water user, and the regulatory agencies. These may include the state health department, the local health department, plumbing inspection services, and any other local agencies having regulatory responsibilities.

The water purveyor has the responsibility of providing its customers with water that is safe, under all foreseeable circumstances. Thus, in the exercise of this responsibility, the water purveyor must protect the community distribution mains from hazards on customers' premises that may potentially degrade water in the community system.

The water user has the dual responsibility of protecting the quality of the water in the community system from degradation originating from a condition on his premises and of protecting the water users on his own premises. Protection of the community supply can be accomplished by installation and maintenance of a backflow prevention device at the water service connection. Protection of the

building piping system should be accomplished in compliance with local plumbing ordinances and by maintenance of an internal cross-connection control program.

The regulatory agencies are responsible for ensuring that the public interest is served. They enforce appropriate laws, rules, and regulations and see that necessary action programs are carried on by the water purveyor and water users.

Sec. 5—Elements of Cross-Connection Control

Cross-connection hazards vary widely in degree. Generally, the degree of protection should be commensurate with the degree of hazard. Further, the degree of protection depends on the type of device provided and the extent of testing and maintenance of that device.

Cross connections may permit backflow from either back pressure or back siphonage.

Backflow due to back pressure (pumping hazards). Pumping hazards are a potential cause of backflow of degrading liquids into a community water system. Backflow occurs when there is a cross connection from a domestic water system to a second system of pipelines, tanks, or similar equipment containing water or other liquids under a pressure greater than that in the domestic system at the point of interconnection. Pumping hazards can exist at the water service connection to sewage or storm water pumping stations, sewage treatment plants, waterfront properties, industrial plants handling liquids under pressure, and buildings where sewage is pumped on the premises. Such cross connections may make it possible for large quantities of dangerous materials to enter the domestic water system.

Pumping hazards permitting backflow of sewage or toxic chemicals are highly dangerous. Thus, there is considerable risk in obtaining water for an auxiliary supply from a sewage-polluted stream, bay, or lake. Indeed, all auxiliary water sources not under the surveillance of a public-health agency must be regarded with suspicion, though auxiliary wells usually produce safe water.

To protect against these pumping hazards one might remove the basic cause (possibly by abandoning a sewage-polluted auxiliary source); deliver water from the community water supply overhead—through an "air gap"—to a receiving tank; or install a backflow prevention device at the service connection. The latter two actions will protect the community water supply but will not protect the people drinking water within the property under discussion. Some health authorities will accept only air gap separation (or abandonment of the polluted auxiliary source) as protection against the above-stated pumping hazards. Where an air gap separation is not practical and there is a health hazard, some authorities will accept a reduced-pressure-principle backflow protection device.

Many industrial premises handle nontoxic materials under pressure. Cross connections permitting backflow of such materials into the community water supply may not create public health hazards but can create objectionable conditions within the public system. With nontoxic materials, such conditions can be prevented by the elimination of internal interconnections, or, if this cannot be achieved, the in-

stallation of an approved double check valve assembly at the service connection is considered acceptable protection by some authorities.

Backflow due to back siphonage. A second means of contaminating the community water supply is through back siphonage. Back siphonage can occur when negative pressure develops, either in the water user's piping system or, more seriously, in the community piping system.

Negative or subatmospheric pressures in a piping system can result in the transfer of water from water-using fixtures into a building piping system, and under certain conditions into the community water system. Therefore, back-siphonage hazards generally present a greater threat to water consumers within a building or industrial plant than to a community water system. Negative pressures occur more frequently in building piping systems and are caused by insufficient internal hydraulic capacity for shutting off and draining the consumer system for repairs or by low pressure in the community water system. In community piping systems, negative pressures can be caused by main breaks, planned or emergency shutdowns, fire demands. water use exceeding the hydraulic capacity of the system, and other reasons.

If pressure is maintained at the point of service from a community water system to a consumer's system, back siphonage will not affect the community water supply. Longer than instantaneous periods of negative pressure in the community water system, however, can result in back siphonage of water from a consumer's piping system. If plumbing defects exist in this consumer's piping system, then the siphoned water will be contaminated and, in turn, will contaminate a portion of the community water supply.

Back siphonage occurs when several conditions exist simultaneously:

1. Negative pressure at a water-using fixture
2. Faulty fixture connection and cross connection
3. Open or leaky control valve between the water pipe and the fixture.

Negative pressure will more commonly occur at the highest points in buildings or community distribution systems. Thus, water use on the lower floors of a building may cause siphonage of water in the upper floors. Similarly, with community distribution systems, in hilly terrain, high water consumption or main breaks may result in negative pressures developing at high points. Water service to facilities at ground elevation, particularly where the general terrain is level, presents a lesser siphonage hazard—for example, water service to lawn sprinklers and swimming pools.

Major back siphonage hazards may result from improper connections to bedpan washers, toilets, sterilizers, siphon ejectors, and certain laboratory facilities.

Water supervisor and color coding (piping identification). Two practices instituted at an industrial plant can contribute to control of cross connections. One is designation of a water supervisor, an individual who may be responsible for piping changes within the property. Such an individual should receive training in cross-connection control and should be in a position to recognize and prevent installation of objectionable connections. Second, color coding (piping installation) of complex piping systems in plants and buildings aid in prevention

of unwitting interconnection of domestic water lines with nondomestic (industrial) lines. Furthermore, color coding facilitates the tracing out of lines where inspections are made for cross-connection control.

Sec. 6—Kinds of Premises Likely to Have Cross-Connections and Descriptions of Types of Uses and Processes Involved in Specific Cross Connections

6.1. Plants or facilities where backflow protection may be needed. One major requirement in a cross-connection control program should be an air gap separation or installation of an approved backflow prevention device at the water purveyor's point of delivery to premises where backflow due to back pressure may occur. Further, in some instances, protection at the point of delivery may be required at premises where major back siphonage hazards exist, particularly at industrial premises or in hilly areas.

For example, plating works usually have many installations of submerged inlets (via pipes or hoses) into tanks and vats. Some water utilities have dealt with this problem by frequent and periodic inspections of such premises to insure elimination of submerged inlets; such a program, however, may be feasible only at small plating works. Other water utilities have categorically required installation of a backflow prevention device at the water service to every plating works. This example illustrates two basic methods of cross-connection control: elimination of the objectionable practice with continuing surveillance, and development of an air gap or installation of a mechanical backflow prevention device at the service connection.

Almost every water-using premises may have actual or potential cross-connection hazards. The following is a partial list of kinds of premises where cross connections are likely to be found:

Aircraft and missile plants
Automotive plants
Beverage bottling plants
Breweries
Buildings (multistory)
Canneries, packing houses, and reduction plants
Chemical plants
Dairies and cold storage plants
Fertilizer manufacturing plants
Film laboratories
Hospitals, medical buildings, mortuaries, morgues, sanitariums, and nursing homes
Laundries and dye works
Metal manufacturing, cleaning, plating, processing, and fabricating plants
Motion picture studios
Oil and gas production facilities
Paper and paper products plants
Plating plants
Power plants
Rubber plants
Schools and colleges with laboratories
Sewage treatment plants, and sewage and storm water pumping stations
Waterfront facilities and industries
Water treatment plants

Potential cross connections exist between the consumer's water system and the following:

1. *Sewage pumps* used for priming, cleaning, flushing, or unclogging
2. *Water-operated sewage sump ejectors*
3. *Sewer lines* used for disposing of filter or softener backwash water or water from cooling systems, or for providing a quick drain for building lines, or for flushing or blowing out obstructions in a sewer line
4. *Water-cooled equipment that may be sewer connected,* such as heat exchangers, compressors, and air-conditioning equipment

5. *Contaminated or sewer-connected equipment,* such as bedpan washers, flushometer valve toilets and urinals, autoclaves, specimen tanks, sterilizers, pipet washers, cuspidors, aspirators, and autopsy and mortuary equipment

6. *Laboratory equipment* that may be chemically or bacteriologically contaminated

7. *Plating facilities* involving the use of highly toxic cyanides, heavy metals in solution (such as copper, cadmium, chromium, and nickel), and acid and caustic solutions

8. *Plating solution filtering equipment* with pumps and circulating lines

9. *Industrial fluid systems and lines* containing cutting and hydraulic fluids, coolants, hydrocarbon products, glycerine, paraffin, and caustic and acid solutions

10. *Shrinking, bluing, and dyeing machines* with direct connections to circulating systems

11. *Laundry machines* having underrim or bottom inlets

12. *Dye vats* in which toxic chemicals and dyes are used

13. *Pulp, bleaching, dyeing, and processing facilities* that may be contaminated with toxic chemicals

14. *Automatic film processing facilities,* such as machines, tanks, vats, and other facilities used in processing film

15. *Open reservoirs, lagoons, tanks,* or similar facilities

16. *Dehydration tanks and outlet lines from storage and dehydration tanks* used for purging purposes

17. *Storage tanks, cooling towers, and circulating systems* that may be contaminated with bird droppings, algae, bacterial slimes, or toxic water treatment compounds

18. *Tanks, vats,* and other vessels used in painting, descaling, anodizing, cleaning, stripping, oxidizing, etching, passivating, pickling, dripping, and rinsing operations, and lines used for transferring fluids

19. *Tanks and can- and bottle-washing machines and lines* where caustic and acid solutions, detergents, and other compounds are used in cleaning, sterilizing, and flushing

20. *Steam-generating facilities and lines* that may be contaminated with corrosion control chemicals or boiler compounds

21. *Steam-connected facilities,* such as pressure cookers, autoclaves, and retorts

22. *Washers, cookers, tanks, lines, flumes* and other equipment used for storing, washing, cleaning, blanching, cooking, flushing, or fluming, or equipment used for transmission of foods, fertilizers, or wastes

23. *Fire-fighting systems* that may be subject to contamination from antifreeze solutions, other chemicals or chemical compounds, auxiliary or used water supplies, and industrial fluids

24. *Hydraulically-operated equipment* (elevators and hydraulic lifts) where the community water pressure is used directly and back pressure may occur

25. *Equipment under hydraulic test,* such as tanks, valves, fittings, lines, and also pumps, pressure cylinders, or other hydraulic facilities that may force liquids back into a public system

26. *Irrigation systems* that may be equipped with pumps, injectors, pressurized tanks or vessels, or other facilities for injecting into the irrigation system agricultural chemicals, such as fungicides, pesticides, soil conditioning, and similar noxious, toxic, or objectionable substances; and irrigation sys-

tems subject to contamination from submerged inlets, auxiliary water supplies, ponds, reservoirs, swimming pools, and other sources of stagnant, polluted, or contaminated water

27. *Special effects equipment* that injects chemicals and other materials into the water supply for motion pictures and television programs

28. *Mud pumps and mud tanks*

29. *Oil well casings* used for dampening gas pressures

30. *Oil and gas tanks* in which hydraulic pressures are used to raise oil and gas levels

31. *Gas and oil lines* used for testing, evacuating, and slugging.

6.2. Cross connections involving water-using fixtures and equipment and a public supply system. Almost every water-using fixture and device may be improperly designed, connected to a domestic water system, or used so that a cross connection results. With the majority of these connections, backflow occurs as a consequence of development of negative pressure in the domestic water supply line. In a few instances, for example with steam boilers, positive pressure may be developed within the equipment or device and backflow may occur even before negative pressures develop in the domestic water lines.

Back siphonage poses a potential threat to a community water system only at times of negative pressure in the street mains. Major back siphonage hazards may necessitate installation of meter protection where pressure in the community supply is unreliable. In this instance, an important objective of a cross-connection program should be the improvement of the community water system so that adequate continuous pressure is assured.

Back-siphonage hazards can be eliminated through passage and enforcement of adequate plumbing ordinances. Some of the considerations for requiring installation of a backflow prevention device at a point of delivery should be: (1) possibility of a negative pressure occurring in the street main; (2) duration of negative pressure; (3) time of flow from a point of back siphonage to the street main; (4) elevation of relevant plumbing defects above the service connection; (5) water use within a consumer's premises at the time of negative pressure; (6) internal piping details (for example, upfeed or down-feed stack); and (7) type of hazard, if any, that may result.

These considerations are significant because for back siphonage to affect a street main, a negative pressure must exist for a sufficient period of time to permit siphonage and for the fluid to flow through the building piping system to the street main before pressure is restored in the main.

The following is a list of types of water-using equipment creating plumbing hazards, one or more of which may be found in premises supplied with potable water:

Air-conditioning systems
Aspirators (including mortuary)
Blueprint machines
Car-washing equipment
Chemical and chemical solution lines
Coffee urns
Compressors
Cooling water systems and towers
Dental cuspidors
Display fountains
Ejectors (steam or water)
Fish ponds
Garbage can washing equipment
Garden spray aspirators
Hospital and laboratory equipment—autoclaves, bedpan washers, instrument sterilizers, pipet washers, and X-ray processing equipment

Hydraulic applicators for fertilizer and other farm chemicals
Hydraulic lifts
Industrial process fluid lines, tanks, and vats
"Industrialized" water lines
Irrigation systems under pressure
Lawn sprinklers
Laundry equipment
Mechanical equipment and engines (for cooling)
Plumbing fixtures—flushometer valves on toilets, below-rim inlets to basins and tubs, washing machines, dishwashers, and garbage grinders
Pressure cookers and food-processing equipment
Process water recirculating system
Sewer flush tanks
Slop sinks and utility hoppers
Soda fountains
Steam boilers
Steam tables and other kitchen equipment
Swimming pools
Tanks and vats
Vacuum systems
Water-using mechanical equipment
Water troughs

6.3. Fire systems. Industrial fire protection systems consist of sprinklers, hose connections, and hydrants. Sprinkler systems may be dry or wet, open or closed. Systems of fixed-spray nozzles may be used indoors or outdoors for protection of flammable-liquid and other hazardous processes. It is standard practice, especially in cities, to equip automatic sprinkler systems with fire department pumper connections.

For cross-connection control, fire protection systems may be classified on the basis of water source and arrangement of supplies as follows:

1. Class 1—direct connections from public water mains only; no pumps, tanks, or reservoirs; no physical connection from other water supplies; no antifreeze or other additives of any kind; all sprinkler drains discharging to atmosphere, dry wells, or other safe outlets

2. Class 2—same as Class 1, except that booster pumps may be installed in the connections from the street mains (Booster pumps do not affect the potability of the system; it is necessary, however, to avoid drafting so much water that pressure in the water main is reduced below 10 psi.)

3. Class 3—direct connection from public water supply main plus one or more of the following: elevated storage tanks; fire pumps taking suction from above-ground covered reservoirs or tanks; and pressure tanks (All storage facilities are filled or connected to public water only, the water in the tanks to be maintained in a potable condition. Otherwise, Class 3 systems are the same as Class 1.)

4. Class 4—directly supplied from public mains similar to Classes 1 and 2, and with an auxiliary water supply on or available to the premises; or an auxiliary supply may be located within 1,700 ft of the pumper connection

5. Class 5—directly supplied from public mains, and interconnected with auxiliary supplies, such as: pumps taking suction from reservoirs exposed to contamination, or rivers and ponds; driven wells; mills or other industrial water systems; or where antifreeze or other additives are used

6. Class 6—combined industrial and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks.

Generally, fire protection systems of Classes 1 and 2 will not require backflow protection at the service connection. Pumper connections of automotive fire department equipment to street

hydrants are not ordinarily health hazards.

Class 3 systems will generally require minimum protection (approved double-check valves) to prevent stagnant waters from backflowing into the public potable-water system.

Class 4 systems will normally require backflow protection at the service connection. The type (air gap, reduced-pressure, or double check valves) will generally depend on the quality of the auxiliary supply.

Classes 4 and 5 systems normally would need maximum protection (air gap or reduced pressure) to protect the public potable-water system.

Class 6 system protection would depend on the requirements of both industry and fire protection, and could only be determined by a survey of the premises.

A meter (compound, detector check) should not normally be permitted as part of a backflow protection device. An exception may be made, however, if the meter and backflow prevention device are specifically designed for that purpose.

Sec. 7—Cross-Connection Control

Practices

7.1. General operational criteria. Usually, the primary responsibility of the water purveyor is to protect the public potable-water system from contamination by solid, liquid, or gaseous pollutants originating from a consumer's premises. When a hazard or potential hazard to the public water system is found on a consumer's premises, the consumer may be required to install an approved backflow prevention device at each public water service connection to the premises. The type or kind of device should depend on the degree of hazard involved.

After an approved backflow prevention device has been installed at a point of delivery, the water purveyor no longer has to be concerned with the consumer's internal water system. The responsibility for segregating domestic and industrial water uses internally usually devolves upon the health agency (or others having jurisdiction) and the consumer. The water purveyor should be informed of any change in use of water on a consumer's premises that would affect the degree of hazard to the public system.

In making a determination of potential backflow hazards it should be remembered that backflow can occur under a wide range of pressure differentials, varying from vacuums to very high pressures. This means that backflow can occur from a consumer's premises into the public potable-water system when the street main pressure is lower than the consumer's pressure, is at atmospheric pressure, or is under a partial vacuum. Thus, there is no specific positive or negative pressure that could be used as a standard for predicting the differentials of pressure at which backflow may occur. It should be assumed that backflow into the public system will occur when a higher pressure can be attained in the consumer's system.

Plumbing cross connections can be a particular health hazard to occupants of multistoried buildings—especially those with up-feed systems—such as hotels, apartment houses, hospitals, medical and dental buildings, and buildings containing laboratories. In

such buildings, the absence of vacuum breakers or air gap separations, or the removal or failure of internal backflow prevention devices can present a special danger to health by contamination of the public water system. These devices may be on cross connections to sewers, such as flush valve toilets and bed pan washers. If there is no adequate program of installation or maintenance, failure of such internal devices can be anticipated, and therefore a water purveyor should require protection at the point of delivery.

7.2. New construction. Where possible, plans should be checked prior to construction to determine the degree of hazard and the class of backflow prevention device, if any, required at the point of delivery. If adequate plans and specifications are not available and no realistic evaluation of the proposed water uses can be determined, the consumer, architect, engineer, or other authorized person should be advised—and therefore anticipate—that eventually circumstances may require the installation of maximum backflow protection of the water service connection.

In planning the service connection to an industrial plant, designers should divide the system into domestic and industrial uses at the point of delivery and provide for a backflow prevention device on each leg or branch. If the types of backflow prevention devices cannot be immediately determined, a spool of dummy section of pipe should be installed temporarily on each leg or branch at the service connection in lieu of a backflow prevention device. When water use requirements and the degree of hazard have been established and it has been found that there is an actual need for a backflow prevention device, the dummy sections may be removed and replaced by appropriate backflow prevention devices, in accordance with the degree of hazard. If no backflow protection is immediately required, the spacer would remain in place until there is a need for a device.

7.3. Existing systems. A survey should be made of a consumer's water system in order to determine the degree of hazard to the public potable-water system. This 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; the availability of auxiliary "delivered" or used water supplies; the use or availability of pollutants, contaminants and other liquid, solid, or gaseous substances that may be used industrially for stabilization of water supplies; and other procedures for determining the degree of hazard.

7.4. Typical methods of backflow prevention. When a hazard has been found and properly classified, effective steps should be taken, when necessary, to require the installation of backflow prevention devices at service connections to prevent possible pollution or contamination of the public system. The devices should be installed on each service connection at the point of delivery and ahead of any outlet. Where the consumer's water line is divided at the point of delivery, a device must be installed on each leg or branch—that is, industrial and domestic; the type and kind of device needed on each leg or branch should be in accordance with the highest degree of hazard found.

It may be expedient or necessary under certain circumstances for a water purveyor to approve the installation of

a lead-in line into the premises, at a considerable distance beyond the service connection (point of delivery), before installing backflow protection. When this is done, the domestic and industrial distribution systems should be divided with a backflow prevention device, when necessary, on each leg or branch at the point of separation. The type and kind of device installed on each leg or branch will depend on the highest degree of hazard found along the line. In applying this alternate, the water purveyor should police the consumer's lead-in line as far as the backflow prevention device to be assured that the consumer does not install any unprotected take-offs between the point of delivery from the potable-water supply and the backflow prevention device.

7.5. Installation of devices. All devices, whether of the double check or reduced-pressure type, should have their locations approved. They should be in locations where they are readily accessible for maintenance and testing and should not be located where any part of the device will be submerged at any time. This is particularly applicable to the reduced-pressure type of device. Preferably, devices should not be installed in pits below the ground, but if this is necessary, the pit should be well-drained to prevent flooding.

7.6. Testing, inspection, and test programs. Regular testing, inspection, and maintenance of all backflow devices, and appropriate records of the results, are essential parts of any cross-connection program.

Township of Brick

401 Chambers Bridge Road, Brick, N.J. 08723 (201) 477-3000

Office of
Division of Inspections

March 1, 1983

Philadelphia Manufacturers
Mutual Insurance Company
Plaza Nine
Woodbridge, NJ 07095

ATTENTION: Robert Parvin

Dear Mr. Parvin:

This letter is to confirm our many telephone conversations on back-flow prevention at Vornado's, Brick facility, which is being occupped by Caldors and Shop Rite.

A written request for a Certificate of Occupancy shall be advisable upon receipt of the interpretation of the A.W.W.A. that fire department pumper connections are not ordinarily a health hazard.

I have spoken to Morris Scarpa in reference to handicap parking. Symbols must be painted in parking areas designating the handicap spaces.

Siamese connections at the street line bordering Chambers Bridge Road should be painted and areas marked to designate same.

I would appreciate a proposal that would be more effective in case of fire in reference to siamese connections that are mounted on the walls of buildings.

Enclosed you will find a copy of the interpretation of the A.W.W.A. that I received from the Department of Community Affairs.

Sincerely,

Arthur J. Cierzo
Construction Official

AJC/wp

cc: Morris Scarpa, Vornado Inc.
174 Passaic St., Garfield, NJ 07026

Division of Inspections

Cal. Don

Old Two Guys.

(1) Hole in ceiling stock room, front of store.

(2) Wall in stock room not completed to ceiling.

Elec (3) Electrical wires exposed, no covers on some boxes, service panels open in stock room area.

Elec (4) Heating Units needs finishing, some are not completed.

Elec. (5) Stock to close to heating Unit, stock room near ants supplys.

Elec (6) Light fixtures in main stock room do not have covers, wires hanging

Elec. on light bulbs.

(7) Sprinkler head at top of stairs stock area, need raising.

(8) Carpet at exits need repairing

(9) Sprinkler system to be finished and tested.

3 (10) Signs to be installed on sprinkler alarm room doors.

4 (11) Fire zones & fire lanes to be marked and signs installed where needed.

ten - FR Temp.

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