



Meeting: Village Board
Meeting Date: 5/23/11
Agenda Item: 7c

Mission Statement

Delivering quality services in a courteous, cost-effective and efficient manner.

VILLAGE BOARD MEETING STAFF REPORT

REPORT TO: Burt R. McIntyre, President
Village Board of Trustees

REPORT FROM: Geoffrey S. Farr, PE, Director of Public Works

AGENDA ITEM: Review and take action on Resolution 2011-10, a policy implementing a program for controlling cross connections within the public water supply system.

POLICY ISSUE

Should the Village Board approve the resolution establishing a policy for conducting inspections and eliminating cross connections?

BACKGROUND INFORMATION

The State of Wisconsin adopted Administrative Codes NR 810.15 and Comm. 82.41. NR 810.15 requires the Village implement a program and adopt an ordinance to control cross connections in the public water supply system. Comm. 82.41 identifies requirements for protection devices to resolve various cross connection types and situations.

The goal of implementing a Cross Connection Control Program and related policy is to protect the public water supply by minimizing the potential for contamination of the water system via cross connections. A Cross Connection is defined as any connection between two otherwise separate systems, one of which contains potable water from a public water system and the other water from a private source, which is water of unknown or questionable safety or steam, gases or chemicals, whereby there may be a flow from the private system to the public system, the direction of flow depending on the pressure differential between the two systems. For instance, reverse flow could occur from a potentially contaminated private system to the public distribution system as a result of low public system pressure due to fire fighting or a watermain break.

The Village adopted a cross connection control ordinance in May of 2008 and began limited inspections but did not establish a policy or program detailing how the ordinance would be implemented. The attached resolution establishes how that would be accomplished.

Generally the policy requires that the Village Water Utility conduct inspections of single-family and duplex residences every 10 years or less. The Village will conduct an initial inspection and one re-inspection if needed at no cost. If subsequent inspections are required to determine compliance, the property owner will be charged \$25 for each re-inspection. The property owner is required to resolve any detected cross connections at their cost.

Due to the complexity of multifamily, commercial and industrial sites, the property owner is required to inspect their own premises and resolve cross connections themselves with properly trained inspectors at their own cost. Multifamily properties are required every 10 years like other residential properties. Industrial/Commercial properties are considered to be higher risk properties and must be inspected every two years.

PRIOR ACTION/REVIEW

The Village adopted cross connection control Ordinance 2008-15 in May of 2008.

FISCAL IMPACT:

- | | |
|------------------------------|------------|
| 1. Is There A Fiscal Impact? | <u>Yes</u> |
| 2. Is it Currently Budgeted? | <u>No</u> |

RECOMMENDED ACTION

Village staff recommends the Village Board approve the attached resolution.

If the Village Board agrees with this action, the following motion could be used, ***“Motion to approve Resolution 2011-10, a policy implementing a program for controlling cross connections with the public water supply system.”***

POLICY ALTERNATIVE(S)

The Village Board could take the following actions:

- Approve resolution 2011-10
- Approve the resolution with modifications
- Deny the resolution and decide how to proceed
- Table the resolution and request additional information

ATTACHED INFORMATION

- I. Resolution 2011-10

COPIES FORWARDED TO:

- I. None



RESOLUTION No. 2011-10

RESOLUTION AUTHORIZING A POLICY FOR IMPLEMENTING A PROGRAM FOR CONTROLLING CROSS CONNECTIONS WITH THE PUBLIC WATER SUPPLY SYSTEM

WHEREAS, Providing and maintaining a safe public water supply is a priority of the Village of Howard, and

WHEREAS, Cross connections represent a contamination hazard to the safety of the public water supply system, and

WHEREAS, Cross-connection inspections of private water systems must be completed to ensure compliance with the requirements in Wisconsin Administrative Codes NR 810.15 and Comm. 82.41, and

WHEREAS, The State of Wisconsin requires the Village of Howard ensure that inspections are completed and that records are maintained for WDNR inspection,

WHEREAS, the Village of Howard desires to establish a policy to implement the requirements of a cross connection program in accordance with State of Wisconsin and Village of Howard Code, the following is established,

INTRODUCTION:

The goal of implementing the Cross Connection Control Program is to ensure the protection of the public water supply by minimizing the potential for contamination of the water system via cross connections. Cross-Connection is defined as any connection between two otherwise separate systems, one of which contains potable water from a public water system and the other water from a private source, water of unknown or questionable safety or steam, gases or chemicals, whereby there may be a flow from one system to the other, the direction of flow depending on the pressure differential between the two systems.

LOCAL ORDINANCE:

The authority to carry out and enforce a local cross connection control program will be in accordance with the Village Code or Ordinances Chapter 36 Utilities, Article 2 Water Utility, Division 5 Cross Connections. A copy of the Village Code is included in the appendix.

TRAINING:

Individuals responsible for carrying out the cross connection inspections and re-inspections shall have obtained necessary training through any available manuals on cross connection prevention, including the Cross Connection Manual as published by the former Wisconsin Department of Industrial, Labor and Human Relations and repeated attendance at cross connection training sessions sponsored by the Wisconsin Rural Water Association, Wisconsin Technical Colleges or other recognized agencies. Additionally individuals responsible for

carrying out the cross connection inspections and re-inspections shall be a State Licensed Plumber or Certified Cross Connection Inspector. Said Inspector or Plumber shall submit a statement that sufficient training has been obtained as described above and include a listing of each training session attended in the previous two years. A minimum of attendance at one training session every two years is required.

INSPECTIONS:

Responsibility & Costs:

Residential properties having two or fewer dwelling units:

The water superintendent and/or his designated agent shall be responsible for making the initial cross connection inspections and needed re-inspections to check for the presence of cross connections within the municipal water supply system for residential properties having two or fewer dwelling units. The first inspection and one re-inspection will be paid for by the Water Utility. The second and subsequent re-inspections shall be \$25 and be paid by the property owner.

Single Family and Duplex Residential Properties: The water superintendent and/or his designated agent shall be responsible for making the initial cross-connection inspection and need re-inspections to check for the presence of cross connections. Normal kitchen and bathroom fixtures including faucets, toilets, dishwashers, hand-held showerheads, icemakers will not be inspected. Other fixtures typical to a residence, such as point of use water treatment devices, laundry sinks with threaded faucets, hot water or steam boilers, and indoor/outdoor hose bibbs are not normal kitchen and bathroom fixtures and will be inspected during the cross connection inspections. In general the following procedures will be used:

1. Send letter to customer identifying the need for an inspection
2. Schedule inspection
3. Complete the inspection using a standard form (appendix)
 - Check box for acceptable, not acceptable, or not applicable
 - Comment on location and type (ASSE #) of the backflow prevention device
 - Comment on the cross connection control violation, if applicable
4. Discuss findings with property owner/tenant -
 - Instruct customer to review low hazard area kitchen and bathroom fixtures exempt from inspection
 - Provide vacuum breakers as needed
 - Require signature of responsible party
 - Provide public education material
 - If the owner is not available at the time of the inspection, send letter with copy of report and public educational material

Residential properties having three or more dwelling units and non-residential properties:

The property owner shall be responsible for making the initial cross connection inspections and needed re-inspections to check for the presence of cross connections within the municipal water supply system for residential properties having three or more dwelling units and non-residential properties. All inspections and re-inspections shall be made by a trained inspector and be paid by the property owner. A list of the name of addresses of these establishments is included in the appendix and will be updated from time to time. The updated establishment list will be maintained in the office of the Village of Howard Water Utility.

Multi-Family, Commercial and Industrial Properties: The property owner shall provide a copy of a cross-connection inspection report to the Utility. The inspection shall be

conducted by personnel meeting the training requirements listed above. The report shall be on Utility-provided forms (appendix) and shall be signed by the person conducting the inspection.

Utility staff will review each cross-connection inspection report for the following:

- Proper form
- Completeness
- Proper signature and credentials
- Confirm that there are no violations identified and if so that there is a timeframe for corrective action
- Confirm that the report is consistent with records showing testable assemblies (review DCOMM list)
- Perform a general review of the devices and assemblies for appropriateness

Utility staff will also

- Send initial letters to facilities by February of each year identifying the date by which the inspection must be completed.
- Send reminder letters to facilities
- Track letters sent and completed inspections.
- Collect, review and filing of inspection reports – Note the review of the completed inspections is extremely important.
- Send response letters for incomplete or improper inspection reports

Frequency:

Industrial and commercial customers and other locations where cross connections are known or suspected to exist will be conducted at a minimum of once every two years.

All other customers (including single family, duplex and multifamily residential customers) will be inspected a minimum of once every ten years or a frequency that follows the schedule for re-calibrating or replacing customer water meters not to exceed once every ten years.

In addition, whenever it is suspected or known that modifications have taken place to piping systems serving a particular water customer, re-inspection of the premise will be made.

PROTECTIVE DEVICES:

The methods to protect against the hazards of cross connections as specified in s. Comm. 82.41, Wis. Adm. Code and further detailed in the former DILHR publication Cross-Connection Control Manual will be incorporated into the Village of Howard cross connection control program. Specific devices to be installed will have to have been listed in the WI Plumbing Products Register published on a quarterly basis by WI Department of Commerce. Whenever any deviation from the recommended methods of protection is contemplated, approval from the Wisconsin Department of Commerce or Natural Resources shall first be obtained. The appendix contains a listing of common devices that will be required to be installed for various cross connections.

EDUCATIONAL/PROMOTIONAL PROGRAMS:

In order to educate the users of the water utility about the hazards of cross connections and proper method to protect against them, the Village of Howard will provide customers the following:

Public education material will be mailed once every three years, made available at the utility office, and posted on the utility web site.

Public education materials will be provided to residential customers with low hazard areas consisting of normal kitchen and bathroom fixtures during on-site inspections.

COMPLIANCE TIME:

The time allowed for correction or elimination of any cross connection found shall be as follows:

Where cross connections pose an eminent and extreme hazard, in order to protect the health and safety of the other users of the water system, the water service shall be discontinued (shut off) immediately as specified in Cross Connection Control Ordinance and be so maintained until necessary protective devices or modifications are made.

Cross connections which do not pose an extreme hazard to the water supply system, but nevertheless constitute a cross connection should be corrected within a reasonable period of time.

Thirty (30) days period will be allowed for the customer to comply with the cross connection ordinance.

In order to protect the health and safety of the other users of the water system, failure of the customer to comply with the cross connection control ordinance in a timely manner will result in the Village of Howard discontinuing the water service (shut off) and be so maintained until necessary protective devices or modifications are made.

If an inspection or re-inspection letter is not acted on in 30 days, the Utility Department will send a water service disconnection letter. Disconnection letter will state water will be shut off in 10 days if not compliant. The letter will be copied to the Building Inspection Department.

If the premise has multiple tenants, each resident will need to be notified.

If no response to the disconnection letter, an orange disconnection card will be hand-delivered to the site 24 hours prior to shut off. In-person contact will be attempted. The Building Inspection Department will also be notified to tag the premise building as non-habitable.

TESTING:

All cross connection control devices shall be required to be maintained and tested in accordance with Comm. 82, Wis. Adm. Code. All facilities that have devices requiring testing will need to keep copies of the latest testing records available at the facility.

RECORD KEEPING:

The water utility shall maintain sufficient and accurate records of its local cross connection control program including individual inspection records. Copies of records to be kept are included in the appendix.

APPENDIX A – INSPECTION RESPONSIBILITY / SCHEDULE MATRIX

<u>Customer Type</u>	<u>Inspection Responsibility</u>	<u>Schedule / Inspection Interval</u>
Single Family/ Duplex	VILLAGE	10 Year max or at meter change
Multi Family	PROPERTY OWNER	10 Year max or at meter change
Commercial/ Industrial	PROPERTY OWNER	2yr / every other year

APPENDIX B – STATE & VILLAGE CODES

NR 810.15 Cross connections and interconnections. Unprotected cross-connections are prohibited. Cross-connections shall be protected as required in s. [Comm 82.41](#). Water system interconnections are prohibited except as provided in sub. (2). In addition the following requirements shall be met:

(1) CROSS CONNECTION CONTROL PROGRAM. In order to protect the public water supply system, the water supplier for every municipal water system shall develop and implement a comprehensive cross connection control program for the elimination of all existing unprotected cross-connections and prevention of all future un-protected cross connections to the last flowing tap or end-use device. The program may include providing public education materials in lieu of inspections of low hazard portions of residential or commercial facilities. Low hazard areas consist of normal kitchen and bathroom fixtures. The water supplier shall keep a current record of the cross connection control program available for annual review by the department. The cross connection control program shall include:

(a) A complete description of the program and the administration procedures, including designation of the inspection or enforcement agency or agencies.

(b) Local authority for implementation of the program, such as ordinance or other governing rule.

(c) A time schedule for public education materials, surveys and follow up surveys of consumer premises for cross connections including appropriate record keeping. Unless otherwise authorized by the department, water suppliers for each municipal water system shall cause a survey to be conducted for every residential service a minimum of once every ten years or on a schedule matching meter replacement. Public educational materials, when being provided in lieu of low hazard inspections, shall be provided to the customer no less than every 3 years and with every cross connection survey. Unless a detailed alternative schedule is included in the cross connection control program and is approved by the department, water suppliers for each municipal water system shall cause a survey to be conducted for every industrial, commercial and public authority service a minimum of once every 2 years. Commercial properties of similar or lesser risk to residential properties may follow the same schedule as residential properties. Completed survey results shall be maintained by the water supplier until corrections and follow up surveys have been made.

(d) A complete description of the methods, devices, and assemblies which will be used to protect the potable water supply. Compliant methods, devices and assemblies are listed in s. [Comm 82.41](#).

(e) Provisions for denial or discontinuance of water service, after reasonable notice, to any premises where an unprotected cross connection exists or where a survey could not be conducted due to denial.

(f) Submission to the department of a copy of an ordinance establishing a cross connection control program, an annual report including a total number of all service connections by category, and a report indicating the number of surveys completed in each category for that year.

NR 810.15(2) (2) INTERCONNECTIONS WITH OTHER ACCEPTABLE WATER SOURCES. Interconnections between the public water supply system and another source of water are prohibited unless permitted by the department in individual cases. Approval of the department shall be obtained prior to the interconnection.

Unofficial Text (See Printed Volume). Current through date and Register shown on Title Page.

Comm 82.41 Cross connection control. (1) SCOPE.

The provisions of this section set forth the requirements for the protection of water within water supply systems when and where there is the possibility of contamination due to cross connections or backflow conditions.

Note: The Department of Natural Resources governs the operation and design of community water systems and under s. NR 811.09 requires the supplier of water to develop and implement a comprehensive cross connection control program.

(2) MATERIALS. (a) All devices, assemblies and mechanisms intended to protect water supplies relative to cross connection or backflow shall be of a type recognized and approved in accordance with ch. Comm 84 and as described in sub. (4).

(b) All methods including barometric loops and air gaps intended to protect water supplies relative to cross connection or backflow shall be constructed of materials suitable for water supply systems in accordance with ch. Comm 84.

(3) GENERAL REQUIREMENTS. Water supply systems and the connection of each plumbing fixture, piece of equipment, appliance or nonpotable water piping system shall be designed, installed and maintained in such a manner to prevent the contamination of water supplies by means of cross connections.

(a) *Types of cross connection control.* 1. Water supply systems shall be protected against contamination due to cross connections or backflow conditions by one of the methods or devices specified in Table 82.41-1 depending upon the situation or Table 82.41-2 depending upon the specific application or use, and the limitations specified in sub. (4).

2. For the situations described in par. (b) 3., cross connection control shall be provided as part of the fixture fitting outlet or in the water supply piping for the fixture fitting outlet.

(b) *Classifications.* For the purposes of this section:

1. The designation of a high hazard or low hazard situation shall be determined on the basis of how a toxic or nontoxic solution is intended or recommended by the manufacturer of the solution to interface with the potable water supply system.

2. a. A continuous pressure situation shall be considered to exist when a pressure greater than atmospheric within the water supply system exists for more than 12 continuous hours.

b. A noncontinuous pressure situation shall be considered to exist if the conditions in subd. 2. a. do not occur.

3. A high hazard cross connection situation shall be considered to exist for a connection of the water supply system to:

a. Any part of the drain system; and

b. Any other piping system conveying water from nonpotable sources, including but not limited to lakes, rivers, streams or creeks.

4. Except as provided in subd. 5., a high hazard cross connection situation shall be considered to exist at:

a. A water supply hose bibb, faucet, wall hydrant, sill cock or other outlet which terminates with hose threads allowing a hose to be attached;

b. A water supply faucet, wall hydrant or other outlet which terminates with a serrated nipple allowing a hose to be attached;

c. A water supply faucet, hydrant or outlet serving a sink used for building maintenance in a public building;

d. A chemical pot feeder or automatic chemical feeder is installed to serve a boiler, cooling tower or chilled water system; and

e. In the water supply piping connecting to the outlet of a fire hydrant for any purpose other than fire suppression.

5. A cross connection shall not be considered to exist at the hose threaded outlet installed for the sole purpose of:

a. Draining a water supply system or any portion thereof;

b. Obtaining water quality samples of the water supply system or any portion thereof; or

c. Connecting individual residential automatic clothes washers.

6. a. A high hazard situation shall be considered to exist for the connection of 2 water supply systems one supplied by a public water supply and the other system supplied by a private well.

Note: The interconnection of a public water supply system and another source of water is addressed in s. NR 811.09 and must be approved by the Department of Natural Resources.

b. Except as provided in subd. 7., a low hazard situation shall be considered to exist for the connection of a piping system, including but not limited to automatic fire sprinkler systems, standpipe systems, and processing purposes, which provides potable water for nonrequired potable water uses.

Note: Cross connection control devices used in conjunction with automatic fire sprinkler systems are to be listed by an acceptable testing agency for such an application under the standards governing the design and installation of automatic fire sprinkler systems.

7. A cross connection situation shall not be considered to exist when a multipurpose piping system serves a one- or 2- family dwelling provided the sprinkler system is constructed of materials and joints suitable for water distribution systems as specified in ss Comm 84.30 (4) (e) and 84.40, respectively.

(c) *Containment.* 1. For sewerage treatment facilities which are required to conform with ch. NR 110, in addition to the cross connection control required for each potable water usage or water outlet, a reduced pressure principle backflow preventer shall be installed:

a. In the water service to each building or structure within the complex;

b. In the private water main upstream of all water services serving the facility; or

c. In the water distribution system upstream of all water outlets and in the process piping network upstream of all points of use, if both a water distribution system and a process network is contained within the same building or structure.

2. For marinas, wharves and docks where potable water outlets are provided to serve boats or ships, in addition to the cross connection control required for each potable water outlet or usage, a reduced pressure principle backflow preventer shall be installed in the water supply system to limit back flow into the water supply source.

3. The installation of a cross connection control device in the water supply system for a building or structure shall not alleviate the requirement to provide cross connection control for the connection of each plumbing fixture, piece of equipment, appliance or other piping system.

(d) *Prohibitions.* The use of a toxic solution as a heat transfer fluid in single wall heat exchanger for potable water is prohibited.

(e) *Existing automatic fire sprinkler systems.* An alteration, modification or addition to an existing automatic fire sprinkler shall necessitate conformance with this section, if the:

1. Existing water supply line to the existing sprinkler system is increased in diameter; or

2. Existing device or method which had been previously recognized to address cross connection concerns is to be removed or replaced.

Unofficial Text (See Printed Volume). Current through date and Register shown on Title Page.

Table 82.41-1
Acceptable Cross Connection Control Methods, Devices or Assemblies

Methods or Assemblies of Cross Connection Control (Standard)	Situations and Conditions							
	Backpressure				Backsiphonage			
	Low Hazard		High Hazard		Low Hazard		High Hazard	
	Contin- uous Pressure	Noncon- tinuous Pressure	Contin- uous Pressure	Noncon- tinuous Pressure	Contin- uous Pressure	Noncon- tinuous Pressure	Contin- uous Pressure	Noncon- tinuous Pressure
Air-gap Fittings for use with Plumbing Fixtures, Appliances, and Appurtenances (ASME A112.1.3)					X	X	X	X
Air Gaps (ASME A112.1.2)	X	X	X	X	X	X	X	X
Atmospheric Vacuum Breaker (CAN/CSA B64.1.1)						X		X
Backflow Preventers with Intermediate Atmospheric Vent (ASSE 1012)	X	X			X	X		
Barometric Loops					X	X	X	X
Dual Check Valve Type with Atmospheric Port Backflow Preventer (CAN/CSA B64.3)	X	X			X	X		
Hose Connection Backflow Preventers (ASSE 1052)	X ^a	X						
Hose Connection Vacuum Breakers (CAN/CSA B64.2 and B64.2.2)	X ^a	X						
Hose Connection Vacuum Breakers (ASSE 1011)	X ^a	X						
Pipe Applied Atmospheric Type Vacuum Breakers (ASSE 1001)						X		X
Pressure Vacuum Breaker Assembly (ASSE 1020)					X	X	X	X
Reduced Pressure Principle Backflow Preventers And Reduced Pressure Fire Protection Principle Backflow Preventers (ASSE 1013)	X	X	X	X	X	X	X	X
Reduced Pressure Principle Backflow Preventer (CAN/CSA B64.4)	X	X	X	X	X	X	X	X
Spill Resistant Vacuum Breaker (ASSE 1056 and CAN/CSA B64.1.3)					X	X	X	X
Vacuum Breaker (CAN/CSA B64.1.2)					X	X	X	X

^a See limitation listed under s. Comm 82.41 (4) (c) 1. a.

Unofficial Text (See Printed Volume). Current through date and Register shown on Title Page.

Table 82.41-2

Acceptable Cross Connection Control Methods, Devices or Assemblies for Specific Applications

Methods or Assemblies (Standard)	Types of Application or Use
Backflow Preventer for Beverage Dispensing Machines (ASSE 1022)	Beverage dispensers
Chemical Dispensing Systems (ASSE 1055)	Chemical dispensing systems
Double Check Backflow Prevention Assemblies and Double Check Fire Protection Backflow Prevention Assemblies (ASSE 1015)	Automatic fire sprinkler systems and standpipe systems Water-based fire protection system
Double Check Detector Fire Protection Backflow Prevention Assemblies (ASSE 1048)	Automatic fire sprinkler systems and standpipe systems Water-based fire protection system
Double Check Detector Valve Type Backflow Preventer (CAN/CSA B64.5)	Automatic fire sprinkler systems and standpipe systems Water-based fire protection system
Dual Check Backflow Preventer Wall Hydrant — Freeze Resistant Type (ASSE 1053)	Hose threaded outlet connection
Hand Held Showers (ASSE 1014)	Hand held shower assemblies
Laboratory Faucet Type Vacuum Breakers (CAN/CSA B64.7)	Laboratory faucets
Laboratory Faucet Vacuum Breakers (ASSE 1035)	Laboratory faucets
Pressurized Flushing Devices (Flushometers) For Plumbing Fixtures (ASSE 1037)	Flushometer plumbing fixtures
Reduced Pressure Detector Fire Prevention Backflow Prevention Assemblies (ASSE 1047)	Automatic fire sprinkler systems
Trap Seal Primer Valves, Water Supply Fed (ASSE 1018)	Traps for drain systems
Vacuum Breaker Tees [s. Comm 82.41 (5) (j)]	Water treatment devices
Wall Hydrants, Frost Proof Automatic Draining Anti-Backflow Type (ASSE 1019), types A or B	Hose threaded outlet connections
Water Closet Flush Tank Ball Cocks (ASSE 1002)	Gravity water closet flush tanks

(4) LIMITATIONS. (a) Cross connection control devices shall be limited in use in accordance with the respective standard, unless otherwise specifically permitted under this subsection.

(b) 1. Except for a deck-mounted device, a pipe applied atmospheric vacuum breaker shall be installed such that the bottom of the device or the critical level mark on the device is at least 6" above all of the following:

a. The flood level rim of the receptor serving the water supply port.

b. The highest point downstream from the device where backpressure would be created.

c. The highest point of an injection or aspiration port.

2. A deck-mounted pipe applied atmospheric type vacuum breaker shall be installed such that the bottom of the device or the critical level mark on the device is at least one inch above all of the following:

a. The flood level rim of the receptor serving the water supply port.

b. The highest point downstream from the device where backpressure would be created.

c. The highest point of an injection or aspiration port.

(c) 1. a. The use of a hose connection backflow preventer, dual check backflow preventer wall hydrant—freeze resistant or a hose connection vacuum breaker in a continuous pressure situation shall be limited to campgrounds and marinas.

b. The use of a hose connection backflow preventer and a hose connection vacuum breaker shall be limited to the discharge side of a control valve such as a faucet or hose bibb.

2. A hose connection backflow preventer and a hose connection vacuum breaker may not be employed in backpressure situations of more than 10 feet of water column.

(d) A backflow preventer with intermediate atmospheric vent:

1. May not be employed in backpressure situations of more than 150 psig; and

2. May not serve boilers having a maximum steam pressure setting greater than 15 psig or a maximum water pressure setting greater than 30 psig.

(e) 1. A reduced pressure principle backflow preventer and a reduced pressure detector backflow preventer may not be subjected to a backpressure greater than twice the rated working pressure of the device.

2. A reduced pressure principle backflow preventer and a reduced pressure detector backflow preventer which serve a water-based fire protection system may have a test outlet located between the number 2 check valve and the number 2 listed indicating control valve.

3. A reduced pressure principle backflow preventer and a reduced pressure detector backflow preventer which are 2" or smaller in size and which serve a water-based fire protection system are not required to have a test cock on the number one listed indicating control valve.

(f) A hand-held shower may not be employed in backpressure situations of more than 5 feet of water column.

(g) 1. A double check backflow prevention assembly and a double check detector assembly backflow preventer may not be subjected to a backpressure greater than twice the rated working pressure of the device.

Unofficial Text (See Printed Volume). Current through date and Register shown on Title Page.

2. A double check backflow prevention assembly and a double check detector assembly backflow preventer which serve a water-based fire protection system may have a test outlet located between the number 2 check valve and the number 2 listed indicating control valve.

3. A double check backflow prevention assembly and a double check detector assembly backflow preventer which are 2" or smaller in size and which serve a water-based fire protection system are not required to have a test cock on the number one listed indicating control valve.

(h) A water supply fed trap seal primer valve shall be installed such that the bottom of the device or the critical level as marked on the device is at least 12" above:

1. The connection to the trap; and

2. The highest point downstream from the device where backpressure would be created.

(i) A vacuum breaker wall hydrant, freeze resistant automatic draining type or a freeze resistant sanitary yard hydrant, may not be employed in backpressure situations of more than 10 feet of water column.

(k) 1. A pressure type vacuum breaker assembly shall be installed such that the bottom of the device or the critical level mark on the device is at least 12" above all of the following:

a. The flood level rim of the receptor serving the water supply port.

b. The highest point downstream from the device where backpressure would be created.

c. The highest point of an injection or aspiration port.

2. A pressure vacuum breaker assembly shall be located only outside.

(L) A laboratory faucet backflow preventer may not be employed in backpressure situations of more than 6 feet of water column.

(m) The cross connection control device to serve a hose bibb or hydrant that penetrates an exterior wall of a heated structure may not prevent a hose bibb or hydrant from being freeze resistant automatic draining as required under s. Comm 82.40 (8) (a).

(n) A spill resistant vacuum breaker shall be installed so that the bottom of the device or the critical level mark on the device is at least 12" above all of the following:

1. The flood level rim of the receptor serving the water supply port.

2. The highest point downstream from the device where backpressure would be created.

3. The highest point of an injection or aspiration port.

(5) INSTALLATION. (a) An air gap for cross connection control shall conform to ASME A112.1.2.

Note: See Appendix for further explanatory material.

(b) Cross connection control methods, devices and assemblies shall be installed in accordance with the manufacturer's written installation specifications and this chapter. The methods, devices and assemblies shall be accessible for inspection, testing, maintenance and replacement.

Note: See s. Comm 84.30 (5) (c).

(c) Cross connection control devices shall be protected from freezing.

(d) 1. A cross connection control device may not be located in uninhabitable spaces susceptible to flooding.

2. A cross connection control device which has one or more vent ports may not be located in a pit, vault or depression which is below the adjacent grade or floor level, even if the pit, vault or depression is provided with a drain at the bottom of the pit.

(e) 1. Vent ports of cross connection control devices shall be positioned:

a. Away from areas where toxic gases and fumes may accumulate;

b. Downward or protected to protect the ports from falling debris; and

c. So as to drain dry.

2. Cross connection control devices or assemblies shall be so located that any vent ports are provided with an air gap so as to comply with s. Comm 82.33 or ASME A112.1.3.

3. a. If a reduced pressure principle backflow preventer or a reduced pressure detector backflow preventer is located within a building, a drain or receptor shall be provided to receive the discharge from the vent ports of the device. If a floor drain is to receive the discharge from the vent ports of a reduced pressure principle backflow preventer or a reduced pressure detector backflow preventer, the flow or pathway of the discharge may not create a nuisance.

b. Where drain piping is provided for the discharge from a vent port, an air gap in accordance with par. (a) shall be provided between the vent port and the drain piping.

c. Where a receptor is provided for the discharge from a vent port, an air gap in accordance with par. (a) shall be provided between the vent port and the receptor.

(f) The installation of a reduced pressure principle backflow preventer, a reduced pressure fire protection principle backflow preventer, a reduced pressure detector backflow preventer, a reduced pressure detector fire protection backflow prevention assembly, a double check backflow prevention assembly, a double check detector assembly backflow preventer, a pressure vacuum breaker assembly and a spill resistant vacuum breaker shall conform to all of the following limitations:

1. The minimum distance between the floor, surface or platform which is to provide access and the lowest point of the assembly may not be less than 12".

2. The maximum distance between the floor, surface or platform which is to provide access and the lowest point of the assembly may not be more than 7 feet.

3. The minimum distance between a ceiling or other obstruction and the highest point of the assembly may not be less than 18".

4. The minimum distance between a wall or other obstruction and the back and ends of the assembly may not be less than 4".

5. The minimum distance between a wall or other obstruction and the front of the assembly may not be less than 24".

Note: See Appendix for further explanatory material.

(g) The discharge outlet of local waste piping serving a cross connection control device shall be visible and not be located within a concealed space.

(h) No control valve may be placed downstream from a pipe applied atmospheric type vacuum breaker or a laboratory faucet backflow preventer.

(i) A barometric loop to provide cross connection control for backsiphonage shall be formed by creating a loop in the potable water supply piping upstream to the source of cross connection.

1. The loop shall extend at least 35 feet above:

a. The highest point downstream from the loop where backpressure would be created; and

b. The point of discharge.

2. No outlets for potable water use shall be installed downstream of the peak of the loop.

(j) Vacuum breaker tees shall be assembled such that:

1. The bottom of the horizontal portion of the tee is installed at least one inch above the flood level rim of the receptor;

2. The inside diameter of the tee is equal to or greater than the inside diameter of the drain piping from the water treatment device;

3. The tee is installed in such a position that the discharge will not create a nuisance;

4. The piping upstream of the tee is of a type suitable for water distribution in accordance with s. Comm 84.30 (4) (c).

Unofficial Text (See Printed Volume). Current through date and Register shown on Title Page.

5. The vent portion of the tee is equal to or greater than the inside diameter of the drain piping from the water treatment device; and

6. The vent port of the tee is:

a. Positioned away from areas where toxic gases and fumes may accumulate; and

b. Constructed to protect the port from falling debris.

(k) A chemical dispensing system shall be connected to the water distribution system in either of the following manners:

1. The fixture supply shall be individually connected to the water distribution system.

2. The fixture supply shall be installed with a pressure bleeding device. The pressure bleeding device shall create a visually free flow of water through the atmosphere from the faucet connection into the fixture drain.

History: 1-2-56; r. (2) through (7), Register, October, 1971, No. 190, eff. 11-1-71; r. and rec. Register, November, 1972, No. 203, eff. 12-1-72; renam. from H 62.14, Register, July, 1983, No. 331, eff. 8-1-83; renam. from ILHR 82.14 and am. (1) (h) 17., r. (2), Register, February, 1985, No. 350, eff. 3-1-85; r. and rec. Register, February, 1994, No. 458, eff. 3-1-94; am. (2) (a), Tables 82.41-1, 2, (4) (c), (e) to (i), (k) to (m), (5) (c) 3., a., (i), cr. (4) (m), r. and rec. (5) (b), (f), r. (5) (h), Register, February, 1997, No. 494, eff. 3-1-97; correction in (4) (n) made under s. 13.93 (2m) (b) 1., Stats., Register, February, 2000, No. 530; am. (3) (a) 2., (4) (k) 1., and (5) (a), r. and rec. (4) (b) and (n), and Tables 82.41-1 and 82.41-2, cr. (4) (k) 1., c. and (5) (L), Register, December, 2000, No. 540, eff. 1-1-01; CR 02-002; am. (3) (intro.), (5) (a), Tables 82.41-1 and 2, renam. (5) (i) to (l), to be (5) (h) to (k) Register April 2003 No. 568, eff. 5-1-03; CR 04-035; cr. (3) (b) 4., d., am. Tables 82.41-1 and -2, 82.41 (2), (3) (a) 1., and (b) 7. Register November 2004 No. 587, eff. 12-1-04; CR 08-055; cr. (3) (b) 4., e., am. (4) (e) 1., a., (f), (i), (n), (5) (a), (c) 2., (f) (intro.), Tables 82.41-1 and 82.41-2 Register February 2009 No. 638, eff. 3-1-09; corrections in (6) made under s. 13.92 (4) (b) 1., and 7., Stats., Register February 2009 No. 638; CR 09-050; r. (6) Register December 2009 No. 648, eff. 1-1-10; CR 10-064; am. (1), (5) (c) 2., Table 82.41-2 Register December 2010 No. 660, eff. 1-1-11.

Subchapter V — Special Plumbing Installations

Comm 82.50 Health care and related facilities.

(1) **GENERAL.** The provisions of this section shall set forth the requirements for the design, installation and maintenance of devices, fixtures and equipment which are installed in health care and related facilities.

(2) **FIXTURES AND EQUIPMENT.** (a) *Special fixtures and equipment.* 1. "Requirements for ice manufacture and storage." Machines for manufacturing ice or any device for handling or storage of ice shall be located in an area not subject to contamination.

2. "Sterilizers and washer sanitizers." a. Sterilizers and washer sanitizers shall discharge by means of indirect waste.

b. The indirect waste piping shall discharge by means of air-gap.

3. "Aspirators." Aspirators which require the use of water shall be provided with approved cross connection control.

(b) *Spouts and actions.* The selection of spouts and actions on plumbing fixtures shall comply with this section and Table 82.50 1.

1. "Spouts". Lavatories and sinks accessible to patients shall have the water supply spout mounted so that its discharge point is a minimum distance of 5" above the flood level rim of the fixture.

2. "Actions." All fixtures used by medical and nursing staff, and all lavatories used by patients and food handlers shall be equipped with valves that can be operated without the use of hands. Where wrist blade handles are used for this purpose, the handles shall not exceed 4 1/2" in length, except handles on scrub sinks and clinical sinks shall be no less than 6" long.

(c) *Floor drain prohibition.* 1. Except as provided in subd. 2., floor drains may not be installed in operating or delivery rooms.

2. Floor drains may be installed in cystoscopic rooms. The drain shall contain a non-splash, horizontal flow flushing bowl beneath the drain plate.

(3) **WATER SUPPLY SYSTEMS.** (a) *Hospital water supply systems.* Water supply systems serving hospitals shall comply with all of the following:

1. All hospitals shall be provided with at least 2 water services. Whenever more than one water main is available, the connections shall be made to different water mains.

2. Each water service connection shall adequately serve the total building water supply demand as specified in s. Comm 82.40 (7).

Note: The installation of two water services or a private water main may require the installation of a check valve. Refer to ch. NR 811 for more information.

(b) *Hospital, community-based residential facility, inpatient hospice and nursing home water supply systems.* 1. Water supply systems serving a hospital, community-based residential facility, inpatient hospice or nursing home shall comply with all of the following:

a. Except as provided in subd. 1. b., a single control valve may serve an area where 4 or fewer patient care units exist and where each unit contains not more than 2 persons.

b. A water supply serving an intensive care patient care unit shall be individually valved.

2. All water distribution piping shall be insulated in accordance with chs. Comm 60 to 66.

3. Cold water shall be supplied to lavatories or sinks located in patient rooms.

4. A hot water distribution system shall be under constant recirculation to provide continuous hot water at each hot water outlet, except that uncirculated hot water distribution piping may not exceed 25 feet in developed length.

5. Water provided to patient showers, therapeutic equipment and all types of baths shall be installed with control valves which automatically regulate the temperature of the water supply to the fixture fitting outlet within a temperature range of 110°F to 115°F. Such control valves shall automatically reduce flow to 0.5 gpm or less when the water supply to the fitting outlet exceeds 115°F or when loss of cold water pressure occurs.

Note: See Appendix A-82.50 (3) (b) 5. for sketches showing various design options.

6. Hot water distribution systems shall be installed and maintained to provide bacterial control by one of the following methods:

a. Water stored and circulation initiated at a minimum of 140°F and with a return of a minimum of 124°F.

b. Water chlorinated at 2 mg/L residual.

Note: Additional information may be contained in ASHRAE Guideline 12-2000, Minimizing the Risk of Legionellosis Associated with Building Water Systems. This standard is published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE); 1791 Tullie Circle, N.E., Atlanta, GA 30329, phone: (800) 5-ASHRAE or (404) 636-8400 ext. 507; fax: (404) 321-5478; e-mail: orders@ashrae.org; or online at www.ashrae.org.

c. Another disinfection system approved by the department.

7. A water distribution system may not be designed, installed and maintained so that the maximum temperature to fixture fitting outlets accessible to patients exceeds 115°F.

Note: See s. Comm 82.40 (5) and ch. DHS 124 for additional requirements for circulation systems.

8. Except as provided in subd. 7., a water distribution system may not be designed, installed and maintained so that the maximum temperature to fixture fitting outlets exceeds 180°F.

DIVISION 5. - CROSS CONNECTIONS

[Sec. 36-140. - Definitions.](#)

[Sec. 36-141. - Regulated.](#)

[Sec. 36-142. - Duty to inspect.](#)

[Sec. 36-143. - Entry for inspection.](#)

[Sec. 36-144. - Disconnection of water service.](#)

[Sec. 36-145. - Emergency disconnection.](#)

[Sec. 36-146. - State code adopted by reference.](#)

[Secs. 36-147—36-174. - Reserved.](#)

Sec. 36-140. - Definitions.

The following words, terms and phrases, when used in this division, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Cross connection means any physical connection or arrangement between two otherwise separate water systems, one of which contains potable water from the village water system, and the other, water from a private source, water of unknown or questionable safety, or steam, gases or chemicals, whereby there may be a flow from one system to the other, the direction of flow depending on the pressure differential between the two systems.

(Comp. Ords. 2000, § 13.06(1); Ord. No. 2008-16, § 13.06(1), 5-12-2008)

Sec. 36-141. - Regulated.

No person shall establish or permit to be established, or maintain or permit to be maintained any cross connection. No interconnection shall be established whereby potable water from a private, auxiliary or emergency water supply other than the regular public water supply of the village may enter the supply or distribution system of said municipality, unless such private, auxiliary or emergency water supply and the method of connection and use of such supply shall have been approved by the village board and by the state department of natural resources in accordance with Wis. Admin. Code § NR 111.25(3).

(Comp. Ords. 2000, § 13.06(2); Ord. No. 2008-16, § 13.06(2), 5-12-2008)

Sec. 36-142. - Duty to inspect.

It shall be the duty of the village board to cause inspections to be made of all properties served by the public water system where cross connections with the public water system is deemed possible. Residential properties serviced by the utility shall be inspected on a ten-year interval. All nonresidential properties serviced by the utility shall be inspected on a two-year interval. The utility may, but is not required to, perform the cross connection inspection of the owner's property. If, in the opinion of the utility, the utility is not able to perform the inspection, the property owner must, at their own expense, have the plumbing inspected for cross connections by a state certified cross connection inspector/surveyor or by a state of licensed plumber. The frequency of inspections and reinspections based on potential health hazards involved shall be as established by the village board and as approved by the state department of natural resources.

(Comp. Ords. 2000, § 13.06(3); Ord. No. 2008-16, § 13.06(3), 5-12-2008)

Sec. 36-143. - Entry for inspection.

Upon presentation of credentials, the representative of the village board shall have the right to request entry at any reasonable time to examine any property served by a connection to the public water system of the village for cross connections. If entry is refused, such representative shall obtain a special inspection warrant under Wis. Stats. § 66.0119. On request, the owner, lessee or occupant of any property so served shall furnish to the inspection agency any pertinent information regarding the piping system or systems on such property.

(Comp. Ords. 2000, § 13.06(4); Ord. No. 2008-16, § 13.06(4), 5-12-2008)

State law reference— Inspection warrants, Wis. Stats. § 66.0119.

Sec. 36-144. - Disconnection of water service.

The village director of public works is hereby authorized and directed to discontinue water service to any property wherein any connection in violation of this division exists, and to take such other precautionary measures deemed necessary to eliminate any danger of contamination of the public water system. Water service shall be discontinued only after reasonable notice and opportunity for hearing under Wis. Stats. ch. 68, except as provided in section 36-145. Water service to such property shall not be restored until the cross connection has been eliminated in compliance with the provisions of this division.

(Comp. Ords. 2000, § 13.06(5); Ord. No. 2008-16, § 13.06(5), 5-12-2008)

Sec. 36-145. - Emergency disconnection.

If it is determined by the village director of public works that any cross connection constitutes an emergency endangering public health, safety or welfare and thereby requires immediate action, a written finding to that effect shall be filed with the village clerk and delivered to the customer's premises, and service shall be immediately discontinued. The customer shall have an opportunity for hearing under Wis. Stats. ch. 68, within ten days of such emergency discontinuance.

(Comp. Ords. 2000, § 13.06(6); Ord. No. 2008-16, § 13.06(6), 5-12-2008)

Sec. 36-146. - State code adopted by reference.

The village adopts by reference the state plumbing code, Wis. Admin. Code chs. Comm 81—87.

(Comp. Ords. 2000, § 13.06(7); Ord. No. 2008-16, § 13.06(7), 5-12-2008)

Secs. 36-147—36-174. - Reserved.

APPENDIX B – COMMERCIAL/INDUSTRIAL & MULTI FAMILY ADDRESS LISTING, for property owner supplied inspections

COMMERCIAL/INDUSTRIAL

Listing to be supplied and maintained by the Public Works Department

MULTI FAMILY

Listing to be supplied and maintained by the Public Works Department

APPENDIX C – EDUCATIONAL MATERIAL, to be included in all cross connection notice mailings and distributed to customer at the time of inspection. This shall also be mailed every three years to the resident property owner to eliminate low risk area inspections for bathroom and kitchens. Example provided below and as supplemented in the future by the Public Works Department.

Village of Howard Water Utility Cross Connection Control Program

What is a Cross Connection?

Internet Resources:

- **Village of Howard**
Web Site
www.villageofhoward.com
- **Wisconsin Department of Natural Resources**
www.dnr.state.wi.us/

On the Reverse Side:

- How Contamination Occurs
- How to Prevent Contamination of Your Drinking Water
- Hose Connection Vacuum Breaker
- Water Closet Air Break

The Howard Water Department staff is committed to providing quality, cost efficient service in the production, treatment, testing and delivery of safe drinking water to all residential and commercial users.

Safe and reliable drinking water is a carefully manufactured product. In order to help ensure safe drinking water the Howard Water Department has adopted a Cross Connection Control Program. This Program is a part of our effort to ensure safe and reliable drinking water and is required under Wisconsin Administrative Code NR 811.09 and Comm 82.41.

A cross connection is a point in a plumbing system where the potable water supply is connected to a non-potable source.

Briefly, a cross connection exists whenever the drinking water system is or could be connected to any non-potable source (plumbing fixture, equipment used in any plumbing system, exterior faucet). Pollutants or contaminants can enter the drinking water system through uncontrolled cross connections when backflow occurs.

Backflow is the unwanted flow of non-potable substances back into the consumers plumbing system and /or public water system (i.e., drinking water).

The Howard Water Department Staff will perform the cross connection inspections for homes. The Howard inspectors will possess proper identification and have undergone training to perform the necessary



inspections.

Questions regarding this program may be directed to the Howard Water Department .

Howard Water Department

1336 Cornell Road
Green Bay, WI 54313
920.434.4060 Phone

Email:

publicworks@villageofhoward.com



Hose Bibb with **Backflow Prevention**
DEVICE #ASSE 1011

Protection of the Public Water Supply System

In general, the installation of plumbing in compliance with the plumbing code will provide adequate protection for your plumbing system. Also, washing machines and refrigerator ice makers already incorporate backflow prevention.

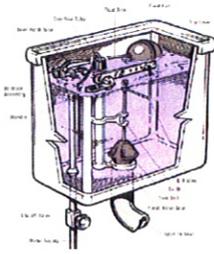
The Water Utility will inspect each home to ensure there is adequate protection for the

public water system. A hose connection vacuum breaker may be required where a residence has outside plumbing connections.

The Howard Water Utility Cross Connection Inspection Program will result in home inspections at time of sale of homes, when water meter battery replacement or water meter service is required, or

when a resident schedules an inspection. An inspection form will be filled out and a copy provided to the resident. If a follow-up inspection is necessary, there will be a charge. Vacuum breaker devices for use on faucets will be available for purchase from the Village and may be installed at the time of inspection.

How Contamination Occurs



Water Closet with properly functioning **Air Break**

Water normally flows in one direction, from the public water system through the customer's cold or hot water plumbing to a sink connection or other plumbing fixture. The plumbing fixture is the end of the potable water system and the start of the waste disposal system.

Under certain conditions water can flow in the reverse direction. This is known as **backflow**. Backflow occurs when a backsiphonage or backpressure condition is created in a water line.

Backsiphonage may occur due to a loss of pressure in the water distribution system during a high withdrawal of water for fire protection, a water main or plumbing system break, or a shutdown of water main or plumbing system for repair. A reduction of pressure below atmospheric pressure creates a vacuum in the piping. If a hose bibb was open and the hose was submerged in a wading pool during these conditions, the non-potable water in the pool would be siphoned into the house's

plumbing and back into the potable water supply.

Backpressure may be created when a source of pressure, such as a pump, creates a pressure greater than that supplied from the distribution system. If a pump supplied from a non-potable source, such as a landscape pond, were accidentally connected to the plumbing system, the non-potable water could be pumped into the potable water supply.

How to Prevent Contamination of Your Drinking Water

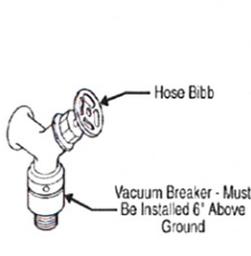
Protect your drinking water by taking the following precautions:

DON'T:

- **Submerge hoses in buckets, pools, tubs, sinks, or ponds.**
- **Use spray attachments without a backflow prevention device.**
- **Connect waste pipes from water softeners or other treatment systems to the sewer or submerged drain pipe.**
- **Use a hose to unplug blocked toilets or sewers.**

DO:

- ✓ **Keep the ends of hoses clear of all possible contaminants.**
- ✓ **If not already equipped with an integral (built-in) vacuum breaker, buy and install hose bibb type vacuum breakers (see the illustrations) on all threaded faucets around your home.**
- ✓ **Install an approved backflow prevention assembly on all underground lawn irrigation systems. Remember, a plumbing permit is required for the connection of an underground lawn irrigation system to your plumbing system.**



Hose Bibb with recommended self draining **Vacuum Breaker**
DEVICE #ASSE 1011



Hand-held Shower head requires the proper installation of a visible standard hose connection **Backflow Preventer**
DEVICE #ASSE 1014.

Hose Connection Vacuum Breaker

Hose connection vacuum breakers are specifically made for portable hoses attached to hose thread faucets. Their purpose is to prevent the flow of contaminated water back into the drinking water. These devices screw directly to the faucet outlet. They can be used on a wide variety of installations, such as service sinks, hose faucets near a wading pool, laundry tub faucets, etc.

Some units are designed for manual draining for freezing conditions. Some are furnished with breakaway set screws as a tamper proof feature.

All hand-held shower heads shall be hung up properly to prevent possible cross connection.

These devices are not intended for operation under continuous pressure.

APPENDIX D – Inspection Forms

Single Family / Duplex Inspection Form- To be supplied and maintained by the Public Works Department

Commercial, Industrial, Multi Family Inspection Form- To be supplied and maintained by the Public Works Department

NOW THEREFORE, BE IT RESOLVED, that the Village Board of the Village of Howard, Brown County Wisconsin, hereby establishes, approves, and adopts; that the above policy be implemented in order to ensure the protection of the public water supply by minimizing the potential for contamination of the water system through the regular inspection and elimination of discovered cross connections.

Adopted this 23rd day of May 2011.

Approved:

Burt McIntyre, Village President

Attest:

Robert Bartelt, Village Administrator