

**Plumbing Board  
Meeting Minutes  
December 10, 2013 at 9:30 a.m.  
Minnesota Room – Department of Labor and Industry  
443 Lafayette Road North, St. Paul, MN 55155**

**Members**

John Parizek (Chair)  
Ron Thompson  
Joe Beckel  
John Flagg  
Mike McGowan  
Pete Moulton  
Chad Filek  
Grant Edwards  
Phillip Sterner  
Jim Lungstrom

**Members Absent**

Jim Kittelson  
Gale Mount  
Larry Justin

**DLI Staff & Visitors**

Pat Munkel-Olson (DLI)  
Cathy Tran (DLI)  
Jim Peterson (DLI)  
Lyndy Lutz (DLI)  
Brian Noma (MDH)  
Anita Anderson (MDH)  
Jim Gander (Superior Mechanical)  
Matt Marciniak (IAPMO)  
Jeff Hill (MWQA)  
Laura Millberg (MPCA)  
Luke Westman (PHCC)  
Gary Thaden (MMCA)  
Mark Wespetal (MPCA)  
Ryan Anderson (MPCA)  
Mike Findorff (MPCA)  
David Ybarra (MPTA)  
Greg Johnson (ICC Consultant)  
Phil Raines (ABC)  
Rick Klein (MNPT)  
Adam Johnson (MWQA)

**I. Call to Order**

The meeting was called to order by Chair Parizek at 9:47 a.m. Introductions and housekeeping announcements were made. Attendance was taken; a quorum was met.

**II. Approval of Meeting agenda**

**A motion was made by Flagg to approve the agenda, seconded by Filek. The majority vote ruled; the motion carried.**

**III. Approval of Previous Meeting Minutes**

**A. Plumbing Board Minutes – 10/15/2013**

**A motion was made by Edwards to approve the 10/15/2013 Minutes, seconded by Flagg. The majority vote ruled and the motion carried with one abstention.**

**B. Plumbing Board Minutes – 11/18/2013**

**A motion was made by Moulton to approve the 11/18/2013 Minutes, seconded by Flagg. The majority vote ruled and the motion carried with three abstentions.**

**IV. Regular Business**

Approval of Expense Reports –Parizek approved the expenses as presented.

**V. Committee Reports**

Nothing to report.

**VI. Special Business**

**A. National Code Review Committee Recommendation**

Continue review of 2012 amendments to the UPC beginning with previously tabled items and all other exhibits not previously addressed.

*Refer to attachment A for discussion on recommendations from the National Code Review Committee.*

**VII. Complaints**

Nothing brought forth.

**VIII. Open Forum**

Nothing brought forth.

**IX. Board Discussion**

Nothing brought forth.

**X. Announcements**

**Next Regularly Scheduled Meetings**

- i. January 21, 2014 @ 9:30 – Minnesota Room, DLI
- ii. April 15, 2014 @ 9:30 – Minnesota Room, DLI

**XI. Adjournment**

**A motion was made by consent to adjourn the meeting at 4:06 p.m.**

Respectfully submitted,



John Parizek  
Chair

**Plumbing Board  
National Code Review Committee  
RECOMMENDED CODE LANGUAGE - 2013**

**Language displayed in RED reflects 12/10/2013 board meeting discussion**

Requester/ Meeting Date	Section	Motion To	Exhibit	Accept or Deny to move forward, or Tabled for future meeting	Carried – Majority, Unanimous, or Fail  Yes or No
<sup>1</sup> DLI 4/16/13	<p>12/10/13 – 301.5.4</p> <p>Ch. 3 2012 UPC</p> <p>Marciniak was asked to provide a list of states that have included Appendices as part of their code body vs. after the code; he stated he would provide this list at the 11/18/13 meeting, along with information on how other states deal with expansion of plastic piping.</p>	<p>301.5.4 Appendix I IAPMO Installation Standards were discussed – all other Chapter 3 items were addressed previously. The department’s recommendation is that the following 5 standards are NOT adopted as part of the code that remain in the appendix: IS 12-2006, IS 13-2006, IS 26-2006, SIS 1-2003, and SIS 2-2003, therefore, the remaining installation standards would be part of the code body.</p> <p>(1) Accept with change to 301.2 relating to “Unless prohibited by this code or by law,....”</p> <p>(2) Accept with change to 301.4.6 as “Prior to the final plumbing inspection, the <del>design professional</del> engineer must provide written certification to the administrative authority that the system has been visually inspected by the <del>design professional</del> engineer or their designee,....”</p> <p>(3) Deny 312.9 referencing mechanical code. Entire exception is deleted. As this is existing language, Tran adds that sections 300.1, 300.2 and 300.3 would need to be brought forward with re-numbering for clarification. Sections 300.1 to 300.3 come from the current plumbing code; sections 300.4 to 300.6 are from chapter 1 of the UPC. Legal counsel commented that there are some vague terms, such as: Section 300.6 – “in fact” – what is the standard for including this language? Section 300.6 is a compilation from different paragraphs, not word for word; therefore the language “in fact” could possibly be stricken. Clarification to be provided to legal counsel directly following the meeting. There was also a deletion in 301.1 “<del>other than those for gas</del>” since the plumbing code does not deal with natural gas. Section 301.1.2 Standards, deletion of language because Appendix I is being adopted. Section 301.1.3 Existing Buildings is stricken because it is already addressed in section 300.3, providing a broader area of when to deviate. Section 301.2 – additional language is similar to current 4715 language. Additional language in 301.4.6 change to be brought forward: Strike “<del>design</del>” and replace with “<u>professional</u>”.</p> <p><b>Section 301.5.4, Appendix I was tabled to be reviewed in more detail at the 11/18/13 or 12/10/13 meeting</b></p>	4	Lungstrom / Beckel Motion to approve the language in 301.5.4 where Appendix I would be adopted as part of the code except for items listed	Unanimous, Carries

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<sup>1</sup> DLI 6/18/13	Ch. 4 (Various)  <i>Tran discussed re-numbering of sections: 409.1, 418.6, 418.7</i>	Accept; with omission of 403.3.1 & 418.4 <ul style="list-style-type: none"> <li>Section 403.3.1 – Previously omitted, not to be included</li> <li>Section 406.3 – Recommended to be removed</li> <li>Section 409.1 – Include existing 415 language</li> <li>Section 418.4 – Previously omitted, not to be included</li> <li>Section 418.6 – Leave existing language in 4715</li> <li><b>Section 418.7 – TABLED FOR 12/10/2013 MEETING (along with 1017)</b> <b>Concerns with definitions of “open” and “enclosed” were discussed. Section 1017 does not require an interceptor, therefore 418.7 will be addressed when dealing with Exhibit 35</b></li> <li>Section 420.3 – Accept moving forward with recommended language</li> <li>Section 421.2 – Temperature change 420°F to 110°F No discussion/concerns</li> <li>Sections 422.0 to 422.1.1 - Recommended new language for section 422.1; striking existing language for sections 422.1 to 422.1.1 as it is already addressed in the building code</li> <li>Sections 422.2 to 422.5 – Recommended striking language</li> </ul>	13	<b>Held - to be addressed with Exhibit 35</b>	<b>N/A</b>
Parizek 4/16 & 9/17	505.4.1, 603.5.4 to 603.5.4.2 (Heat Exchangers)  <i>Marciniak provided a handout with IAPMO's position regarding toxicity (see attached)</i>	Moved 505.4.1 to 603.5.4 Shifting language from chapter 5 to 6  Toxicity rating of propylene glycol (rated 2? – depends on the additive – need to check with author), ethylene glycol (rated 3), and ethanol (rated 2) discussed. The Health Dept. allows propylene glycol and geothermal – require it to be USP grade or pharmaceutical grade, basically pure propylene glycol without other additives although they have allowed some other additives. Propylene glycol is allowed under FDA standards and recognized as non-toxic. The standard that the UPC references are more specific, listing products. New language, items (3a) and (4) were discussed.  <b>Toxicity rating of propylene glycol (rated 2? Is this rated a 2 “question mark” due to the additives or the propylene glycol itself? Discussion on public safety, containment of hot/cold water, contamination of water supply, and average water pressure</b>	14	<b>Moulton / Flagg Motion to accept UPC language except stricken language in 603.5.4, and add “Single Wall Heat Exchangers are prohibited.”</b>  <b>Edwards / Sterner Accept language as presented</b>	<b>4 / 5 Motion FAILS</b>  <b>Majority, Carries</b>

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		<p>required. If language is stricken for single-wall it makes it easier to enforce. Suggestion to add: "Single Wall Heat Exchangers are prohibited". The Department of Health was asked to talk about the impact this is going to have on public water supply systems and how they plan to deal with this type of ruling that is being proposed? MDH stated the requirement for heat and community water system operators require potable water all the way to the tap.</p>			
<p><sup>2</sup>MDH 9/17/13</p>	<p>610.3 (Quantity of Water)</p>	<p>Accept the language (see language recommendation below) <del>as written, no amendments</del> Parizek's new language recommendation to read as follows: "The quantity of water required to be supplied to every plumbing fixture shall be represented by fixture units, as shown in Table 610.3, <u>except for single family residential well water systems that are incapable of supplying the calculated quantity due to hydrologic conditions.</u> Equivalent fixture values shown in Table 610.3 include both hot and cold water demand."  This was an exemption that was proposed to deal with well water systems that were physically or hydrologically incapable of supplying the quantity of water.  Parizek's recommended exception was discussed and whether this language should be added. Chapter 610.13, (5), was read aloud as follows: "Unusual conditions where, in the judgment of the Authority Having Jurisdiction, an adequate supply of water is provided to operate fixtures and equipment".  MDH stated they would like to see a specific exemption instead of leaving it up to the administrative authority, which creates a tough position, somewhat after the fact. MDH added that they don't think the sizing should be exempt, but rather an exemption should be given when you can't meet the flow rate.</p>	<p>25</p>	<p>Beckel / Filek Motion to <b>NOT</b> accept the proposed additional language</p>	<p>Majority, carries</p>

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<sup>3</sup> MWQA 8/26/13 & 9/17/13	611.0 to 611.4 (Drinking Water Conditioning Equipment)	<p>Accept with language amendment: <b>611.1.2:</b> Wetted materials used in drinking water conditioning equipment <del>meet</del> shall comply with ANSI/NSF61 standards, <u>or the equipment shall comply with the applicable NSF standards as listed in Table 1401.1.</u> Tabled due to McGowan's absence from the meeting.</p> <p>Discussion ensued between the language definition of "drinking" and "potable". Should the term "drinking" be amended to read "potable"? Potable water, drinking water, and water conditioning equipment definitions were read aloud.</p> <p><b>Add Exception to 611.1.2, as follows:</b> <b>Exception: Equipment intended to treat water for non-potable uses other than drinking that are protected by an approved backflow device, assembly or method as required in Chapter 6 of this code.</b></p>	26	<p>Parizek / Flagg Motion to accept as presented, striking the underlined word <u>drinking</u> in 611.0, 611.1, 611.1.1, 611.1.2, 611.2, 611.3, and include the exception to 611.1.2 – add <u>non-potable</u> and strike <del>other than drinking</del> ← as shown</p>	Unanimous, carries
<sup>1</sup> DLI 5/21/13	<b>710.13 / 715.3</b>  Ch. 7, Sanitary Drainage – various	<p>Accept all; Exception: 712.1 is changed to reflect the word "shall" instead of "may" as suggested</p> <p>704.3 – include "<u>beverage service sinks</u>" however, "<del>commercial food preparation sinks</del>" language not necessary as similar language is present in MDH's exhibit 29)</p> <p><i>710.13: New language and strike: "<del>where approved by the Authority Having Jurisdiction.</del>" (previously tied vote tabled and brought forward to 12/10/13 meeting)</i></p> <p>712.0 to 712.6: No issues (exception 712.1 addressed above)</p> <p><i>715.3: New language provides clarification</i></p>	31	<p>Section 710.13 Edwards / McGowan Motion to accept new language and stricken, as presented</p> <hr/> <p>Section 715.3 Edwards / Flagg Motion to accept as presented</p>	<p>Section 710.13 Majority, carries</p> <hr/> <p>Section 715.3 Majority, carries</p>

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<sup>1</sup> DLI 5/21/13	Ch. 8 (Indirect Wastes)	All language was accepted as presented, with the modification to Section 814.3 as follows: “or to a place of disposal approved by <del>the rules governed by</del> the Minnesota Pollution Control Agency.”	32	Flagg / Edwards Motion to accept all language as presented, including striking “ <del>the rules governed by</del> ” in 814.3	Majority, carries
<sup>1</sup> DLI 9/17/13	Ch. 9 (Various)	All language accepted as presented with the following modification to 906.7: Strike “ <del>The minimum v</del> ”  The majority of the recommended changes strike rule parts that are not regulated by the board.	33	Flagg / Moulton Motion to accept language as presented with modification to strike <del>The minimum v</del> in Section 906.7	Majority, carries
<sup>1</sup> DLI 9/17/13	Ch. 9 (Venting)  <b>Appendix C</b>	Recommended language in Chapter 9, as presented, was previously denied to move forward, with the exception of Appendix C.	<b>34</b>	Filek / Beckel to deny DLI’s recommendation, keep the existing UPC language, and make sure Appendix C is included as an Appendix, not as part of the code	Majority, carries
<sup>1</sup> DLI 9/17/13	Ch. 10 (Various)	All language accepted as presented, with amendment to 1014.3.7 to read as follows: <b>1014.3.7 Abandoned Gravity Grease Interceptors.</b> “Abandoned grease interceptors shall be pumped and filled as required <del>for abandoned sewers and sewage disposal facilities in Section 722.0</del> <b>per the authority having jurisdiction.</b> ”  1009.2: Intent was to allow other types of interceptors or separators that are not specifically addressed in this chapter (special use type)	35	Flagg / Edwards Motion to accept 1001.1, 1009.2, and 1014.3.7 as amended	Majority, carries

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<sup>1</sup> DLI 9/17/13	Ch. 10 (Various)	<p>The National Code Review Committee recommended striking the underlined language and un-striking the stricken language, with the following friendly amendment to read as follows:</p> <p><b>1017.2 Design of Interceptors.</b>  <u>Oil separators are to be designed to the standards as listed in chapter 14.</u> Each manufactured interceptor that is rated shall be stamped or labeled by the manufacturer with an indication of its full discharge rate in gpm (L/s). The full discharge rate to such an interceptor shall be determined at full flow. Each interceptor shall be rated equal to or greater than the incoming flow. <del>and shall be provided with an overflow line to an underground tank.</del></p> <p>IAPMO PS80 Standards were reviewed and due to time constraints, chapter 10 was tabled.</p>	35	Sterner / Edwards Motion to table for future meeting	Majority, carries
<p>Water Reuse Work Group (MDH inter-agency water reuse group) 11/07/13 and DLI 11/07/13</p> <p>Parizek 8/26/13</p>	Chapter 16 (UPC: Alternate Water Sources for Nonpotable Applications)	<p>Accept in principal with amendments – There needs to be additional discussion / parameters that everyone can accept</p> <p><b><i>Working Draft Place-holder position – Continue working with the Water Reuse Group</i></b></p>	<p>40 replaced current Exhibit 40 with handouts titled:</p> <p>Water Reuse Group draft dated 11/07/13; DLI draft dated 11/07/13</p>	Edwards / Sterner Motion to push forward with Chapter 16 & 17 and continue working with the interagency work group and bring back to board for approval	Unanimous, carries

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Requester/ Meeting Date	Section	Motion To	Exhibit	Accept or Deny to move forward, or Tabled for future meeting	Carried – Majority, Unanimous, or Fail  Yes or No
<p>Water Reuse Work Group (MDH inter-agency water reuse group) 11/12/13 &amp; 10/17/13 and DLI 10/17/13</p> <p>Parizek 8/26/13</p>	<p>Chapter 17 (UPC: Nonpotable Rainwater Catchment Systems) <i>Working Draft Placeholder position – Continue working with the Water Reuse Group</i></p> <p><b>Chapter 17 deals specifically with rain water catchment systems</b></p>	<p>Accept in principal with amendments – motion to move ahead in principal that there needs to be additional discussion / parameters that everyone can accept</p> <ul style="list-style-type: none"> <li>1701.1.1 - Strike the word "Alternate" and add in its place the word "Rain"</li> </ul> <p><i>Parizek made modifications to the Water Reuse Group's Chapter 17 and provided handouts dated 10/17/13 and 11/12/13. Also provided an updated (10/17/2013) DLI Chapter 17. Revisions do not include issues pertaining to water quality standards therefore there shouldn't be issues moving forward with Chapter 17.</i></p> <p><i>Anita Anderson, MN Dept. of Health, Duluth, Water Reuse Group addressed the Board. Water Reuse Group is working on consistent strategy/policy on these issues, addressing water quality parameters. They have an interest in setting and recommending water quality but they don't necessarily have the authority.</i></p> <p><i>Ryan Anderson, MN Pollution Control Agency</i></p> <p><i>Area of focus: Monitor and be careful with discharges of pollutants in the environment. Primary interest is to make certain standards are included in rules and that the rules don't implicate agencies that do not have oversight into those areas. He asked for time to review the changes brought forward in the Chapter 17 handout.</i></p> <p><i>Revised language on DLI's 10/17/13 draft pertaining to Rainwater harvesting was discussed – 1702.9.8 Water Quality Devices and Equipment Required.</i></p>	<p>41 replaced current Exhibit 41 with handouts titled:</p> <p>Water Reuse Group draft dated 11/12/13 and 10/17/13; DLI draft dated 10/17/13</p>	<p>Edwards / Sterner Motion to push forward with Chapter 16 &amp; 17 and continue working with the interagency work group and bring back to board for approval</p>	<p>Unanimous, carries</p>

## NATIONAL CODE REVIEW COMMITTEE SUGGESTION FORM

*Author/requestor:* Cathy Tran

*Email address:* cathy.tran@state.mn.us

*Telephone number:* 651/284-5898

*Firm/Association affiliation, if any:* DLI

### **Suggested Code Change - Language**

Please provide your suggested change using a ~~strikeout~~ and underline format. Provide the *specific* language you would like to see changed, with new words underlined and ~~strikeout~~ the words to be deleted. Tell us whether the language you are suggesting or changing is from a code book or from Minnesota Rules, chapter 4715. (You may provide the language (electronically) on a separate attached sheet).

**2012 UPC Chapter 3** -See attached documentation.

### **Suggested Code Change – Need and Reason**

Please provide a thorough explanation of the need for the suggested change and why the change is a reasonable one. During the rulemaking process, the Board must defend the need for and reasonableness of all its proposed changes. (You may provide the need and reason (electronically) on a separate attached sheet).

See attached documentation.

### **Suggested Code Change – Cost/Benefit Analysis**

Please explain whether the change you suggest will increase or decrease costs, or that the change will not have any cost implications. If there is an increased cost, will this cost be offset somehow by a life-safety or other benefit? If so, please explain. Are there any cost increases or decreases to enforce or comply with the suggested change? If so, please explain. (You may provide the cost/benefit analysis (electronically) on a separate attached sheet).

No cost implications.

**Please explain:**

1. Is the suggested change meant to:

change language contained in a published code book? If so, list section(s).

change language contained in an existing Minnesota Rule in chapter 4715? If so, list the Rule part(s).

delete language contained in a published code book? If so, list section(s).

delete language contained in an existing Minnesota Rule in chapter 4715? If so, list Rule the part(s).

neither; the suggested change is new language and is not in a code book or in Minnesota Rules, chapter 4715.

2. Is the suggested change required by a federal requirement or regulation, state statute or new legislation? If so, please explain and provide the citation to the regulation, statute or legislation.  
MN Statutes 326b.43

3. Will the suggested change impact other sections of a published code book or the Minnesota State Building Code or other administrative rules? If so, please list the affected sections or rule parts.

4. Who are the parties affected or segments of industry that might be affected by the suggested change?

5. Can you think of other means or methods to achieve the purpose of the suggested change? If so, please explain what they are and why your suggested change is the preferred method or means to achieve the desired result.  
no

6. Are you aware of any federal requirement or regulation related to this proposed code change? If so, please list the regulation or requirement.  
No

## CHAPTER 3 - 2012 UPC DLI Proposed changes GENERAL REGULATIONS

The department's recommendation is that the following 5 standards are NOT adopted as part of the code that remain in the appendix: IS 12-2006, IS 13-2006, IS 26-2006, SIS 1-2003, and SIS 2-2003, therefore, the remaining installation standards would be part of the code body.

**301.5.4 Appendix I IAPMO Installation Standards.** Except for IS 12-2006, IS 13-2006, IS 26-2006, SIS 1-2003, and SIS 2-2003, the standards in Appendix I are considered part of this code.

**SONAR:** Appendices must be formally adopted to be part of the code and therefore, Appendix A, B, and part of I are proposed for adoption. The proposed adoption of Appendix A & B are necessary for design, plan review, and consistent administration of the requirements. Applicable installation standards in Appendix I are proposed for adoption to provide installation requirements and ensure consistent enforcement on a statewide basis.

**DLI, Chapter 4 – 418.7: Held until Exhibit 35 could be addressed**

**Section 418.7 – Tabled for 12/10/2013 Meeting (along with 1017)**

Concerns with definitions of “open” and “enclosed” were discussed. Section 1017 does not require an interceptor, therefore 418.7 will be addressed when dealing with Exhibit 35

**Plumbing Board**  
c/o Department of Labor and Industry  
443 Lafayette Road North  
Saint Paul, MN 55155-4344  
[dli.cclboards@state.mn.us](mailto:dli.cclboards@state.mn.us)

**NATIONAL CODE REVIEW COMMITTEE SUGGESTION FORM**

(This form must be submitted electronically)

Author/requestor: Cathy Tran

Email address: [cathy.tran@state.mn.us](mailto:cathy.tran@state.mn.us)

Telephone number: 651/284-5898

Firm/Association affiliation, if any: DLI

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**Suggested Code Change - Language**

Please provide your suggested change using a strikeout and underline format. Provide the *specific* language you would like to see changed, with new words underlined and ~~strikeout~~ the words to be deleted. Tell us whether the language you are suggesting or changing is from a code book or from Minnesota Rules, chapter 4715. (You may provide the language (electronically) on a separate attached sheet).

**2012 UPC Chapter 4** -See attached documentation.

**Suggested Code Change – Need and Reason**

Please provide a thorough explanation of the need for the suggested change and why the change is a reasonable one. During the rulemaking process, the Board must defend the need for and reasonableness of all its proposed changes. (You may provide the need and reason (electronically) on a separate attached sheet).

See attached documentation.

**Suggested Code Change – Cost/Benefit Analysis**

Please explain whether the change you suggest will increase or decrease costs, or that the change will not have any cost implications. If there is an increased cost, will this cost be offset somehow by a life-safety or other benefit? If so, please explain. Are there any cost increases or decreases to enforce or comply with the suggested change? If so, please explain. (You may provide the cost/benefit analysis (electronically) on a separate attached sheet).

No cost implications.

6/18/13 National Code Committee

**Please explain:**

1. Is the suggested change meant to:
  - change language contained in a published code book? If so, list section(s).
  - change language contained in an existing Minnesota Rule in chapter 4715? If so, list the Rule part(s).
  - delete language contained in a published code book? If so, list section(s).
  - delete language contained in an existing Minnesota Rule in chapter 4715? If so, list Rule the part(s).
  - neither; the suggested change is new language and is not in a code book or in Minnesota Rules, chapter 4715.
2. Is the suggested change required by a federal requirement or regulation, state statute or new legislation? If so, please explain and provide the citation to the regulation, statute or legislation.  
MN Statutes 326b.43
3. Will the suggested change impact other sections of a published code book or the Minnesota State Building Code or other administrative rules? If so, please list the affected sections or rule parts.
4. Who are the parties affected or segments of industry that might be affected by the suggested change?
5. Can you think of other means or methods to achieve the purpose of the suggested change? If so, please explain what they are and why your suggested change is the preferred method or means to achieve the desired result.  
no
6. Are you aware of any federal requirement or regulation related to this proposed code change? If so, please list the regulation or requirement.  
No

## CHAPTER 4 - 2012 UPC DLI Proposed changes

### Fixtures

#### CHAPTER 4 PROPOSED

~~403.3.1 Nonwater Urinals. Nonwater urinals shall be listed and comply with the applicable standards referenced in Table 1401.1. Nonwater urinals shall have a barrier liquid sealant to maintain a trap seal. Nonwater urinals shall permit the uninhibited flow of waste through the urinal to the sanitary drainage system. Nonwater urinals shall be cleaned and maintained in accordance with the manufacturer's instructions after installation. Where nonwater urinals are installed they shall have a water distribution line rough-in to the urinal location to allow for the installation of an approved backflow prevention device in the event of a retrofit.~~

*Delete 403.3.1 in its entirety and replace with the following amendments:*

Nonwater urinals shall be listed and comply with the applicable standards referenced in Table 1401.1. Where a nonwater urinal is installed, a water-supplied fixture must be installed upstream of the nonwater urinal at the end of the same drainage branch. The water distribution system must be designed to allow for replacement of nonwater urinals with water-supplied urinals without dead ends. Each nonwater urinal must be separately trapped by a nonpetroleum liquid seal that is lighter than water to protect from odor escape or evaporation of the trap contents. Metallic traps or traps with elastomeric membranes for nonwater urinals are prohibited.

The owner of each nonwater urinal must ensure that the urinal is cleaned and maintained in strict compliance with the manufacturer's requirements after installation.

**SONAR:** To minimize premature failure of the drainage system resulting from build-up of dry raw urine on the drainage pipe from usage over time, the proposed change in section 403.3.1 specifically requires that a water supplied plumbing fixture must be installed upstream of nonwater urinal to provide dilution of the waste stream from the nonwater urinal. In addition, to avoid stagnant water and bacteria growth in the design of the water distribution system from rough-ins in the event of a retrofit, emphasis is placed to avoid dead end branches.

Since nonwater urinals do not have conventional water traps, the proposed language in this subpart prescribe specific fixture trap requirements for nonwater urinal by use of a liquid seal consisting of a non petroleum liquid that is lighter than water. This will prevent odor and evaporation of the trap and minimize unsanitary conditions that may exist otherwise. The proposed language prohibits metallic and elastomeric membrane type traps for nonwater urinals. These types of traps will deteriorate from pure urine waste causing premature failure of the traps. is necessary to protect the integrity of the plumbing system.

~~406.3 Miscellaneous Fixtures. Fixed wooden, or tile wash trays or sinks for domestic use shall not be installed in a building designed or used for human habitation. No sheet metal lined wooden bathtub shall be installed or reconnected. No dry or chemical closet (toilet) shall be installed in a building used for human habitation, unless first approved by the Health Officer.~~

**SONAR:** Propose to delete Section 406.3 in its entirety. Section 401.1 already prescribes general requirements for quality of fixtures that used to evaluate suitability for plumbing fixtures which are not standard fixture. By specifically listing miscellaneous fixtures that are not allowed in this part may be construed or mislead to some improper review and approval of other materials which are not code approved or are prohibited.

#### 409.0 Bathtubs and Whirlpool Bathtubs.

**409.1 Application.** Bathtubs and whirlpool bathtubs shall comply with the applicable standards referenced in Table 1401.1. Pressure sealed doors within a bathtub or whirlpool bathtub enclosure shall comply with the applicable standards referenced in Table 1401.1. Whirlpool pedicure tubs must comply with general requirements and water retention sections of ASME A112.9.7 or IAPMO IGC 155, Pipeless Whirlpool Bathtub Appliances.

**SONAR:** A pedicure whirlpool tub (chair) is considered a plumbing appliance or (special plumbing fixture), and function like the whirlpool bathtubs with the exception that the size is much smaller and only the feet is submerged instead of the entire body. In addition, concerns of sanitation and spreading of diseases through water retention from the recirculation components of the pedicure whirlpool tubs are similar to a typical whirlpool bathtub, if not more when use in commercial nail salons. Therefore, minimum requirements for health and sanitation must be established to protect the public.

One noted difference is that pedicure whirlpool tubs are only intended for submerging of feet, suction and hair entrapment requirements are not of safety concerns that need to be addressed. It is reasonable to adopt at minimum the applicable sections of the standards for the whirlpool bathtubs. The whirlpool bathtub standards are ASME A112.19.7, Hydromassage Bathtub Appliances, and the IAPMO IGC 155, Pipeless Whirlpool Bathtub Appliances. The applicable sections in ASME A112.19.7

which apply to pedicure whirlpool tubs are general requirements which cover material construction, water pump standard UL 1795, and circulation/air piping which includes water retention requirements. The applicable sections of IAPMO IGC 155 are all sections of this standard, except for hair entrapment requirements.

**418.6 Elevator Pit Drain.** An elevator pit drain must discharge to the sanitary sewer using an indirect connection that precludes the possibility of sewage backup into the pit. If a sump pump system is used, the sump must be outside the pit with a dry pan drain flowing to it.

**SONAR:** This proposed part is to clarify the proper method of draining and elevator pit consistent with the Minnesota Elevator Code. The elevator pit will receive hydraulic fluid, grease, oil, which must discharge to the sanitary sewer. In addition, the discharge must be made through an indirect connection to prevent sewage backups from the sanitary sewer system into the pit and the receptor must be sized properly to receive the pump discharge. Addition language is proposed to require a sump when used be located outside the pit so the direct access for maintenance and inspections can be made without entering the pit or elevator shaft.

**418.7 Garage and parking area floor drains.** Floor area drains in open parking areas, including open areas of parking ramps, must discharge to the storm sewer or to a place of disposal satisfactory to the municipal sewer authority. Floor drains in parking areas which are enclosed, and floor drains in areas open or enclosed which are used for maintenance or as a vehicle wash bay, must discharge to the sanitary sewer if a municipal sewer is available. Oil and flammable liquid interceptor must be provided if required by section 1017.

**Exception:** Floor drains in private garages serving one- and two-family dwellings may discharge to daylight if approved by the administrative authority.

**SONAR:** This proposed part is to clarify the proper method of draining of drains in enclosed garages by requiring the drains to discharge to sanitary sewer instead of storm sewer. Drains in enclosed garages generally do not receive rainwater, but will receive oily, greasy, and other types of waste from vehicles even vehicle washing, which need proper treatment. Open areas of parking ramps will receive significant of rainwater and therefore, must discharge to to the storm sewer unless the municipal sewer authority determines other point of disposals are proper for the intended waste in the open parking ramps. Also reference is made to section 1017, Oil and Flammable Liquid Interceptor, for proper design and installation of the interceptor when provided.

An exception for floor drains in one-and two-family dwellings to allow discharge to "daylight" when approved by the local administrative authority. The intent of "daylight" is to allow floor drain discharge onto the ground surface outside the garage. The need for local administrative authority approval is necessary to ensure the discharge is within the owner's property line and does not cross other properties, and to prevent discharge from entering into surface water. The scope is limited therefore the concerns of environmental impact are minimal since there are no commercial or industrial applications in these garages. This has been a practice that has been use as well as coordinated and approved by the Minnesota Pollution Agency.

**418.4 Food Storage Areas.** Where specifically approved by the licensing authority, floor drains may be are provided in storerooms, walk-in freezers, walk-in coolers, refrigerated equipment, or other locations where food is stored, such drains shall have indirect waste piping. Separate waste pipes shall be run from each food storage area, each with an indirect connection to the building sanitary drainage system. Traps shall be provided in accordance with Section 801.2.2 of this code and shall be vented.

**SONAR:** Consistent with section 801.2.2 (Walk-In Coolers) this is clarify that floor drains may only be installed in these types of storage areas when approved by the licensing requirements.

**420.3 Waste Outlet.** Kitchen and laundry sinks shall have a waste outlet and fixture tailpiece not less than 1½ inches (40 mm) in diameter, except commercial pot and scullery sinks must be provided with waste outlets not less than two inches in diameter. Service sinks shall have a waste outlet and fixture tailpiece not less than 2 inches (50 mm) in diameter. Fixture tailpieces shall be constructed from the materials specified in Section 701.1 for drainage piping, provided, however, that such connections where exposed or accessible shall be permitted to be of seamless drawn brass not less than No. 20 B & S Gauge (0.032 inches) (0.81 mm). Waste outlets shall be provided with an approved strainer.

**SONAR:** this is to clarify that commercial pot and scullery must be provided with two inch outlet since these sinks have large compartments and handle commercial kitchen functions that must be provided with two inch outlet.

**421.2 Limitation of Hot Water Temperature for Public Lavatories.** Hot water delivered from public-use lavatories shall be limited to a maximum temperature of 110 120°F (49°C) by a device that is in accordance with ASSE 1070 or CSA B125.3. The water heater thermostat shall not be considered a control for meeting this provision.

**SONAR:** This proposed amendment limiting the max. temperature to 110 degrees F would provide consistent requirement with the MN Commercial Energy Code (ASHRAE Standard 90.1-2004).

#### **422.0 Minimum Number of Required Fixtures.**

**422.1** ~~For all premises subject to this chapter, plumbing fixtures shall be provided for the type of building occupancy and in the minimum number listed in chapter 1305, Minnesota Building Code.~~

~~Plumbing fixtures shall be provided for the type of building occupancy and in the minimum number shown in Table 422.1. The total occupant load and occupancy classification shall be determined in accordance with the building code. Occupancy classification not shown in Table 422.1 shall be considered separately by the Authority Having Jurisdiction.~~

~~The minimum number of fixtures shall be calculated at 50 percent male and 50 percent female based on the total occupant load. Where information submitted indicates a difference in distribution of the sexes such information shall be used in order to determine the number of fixtures for each sex. Once the occupancy load and occupancy are determined, Table 422.1 shall be applied to determine the minimum number of plumbing fixtures required. Where applying the fixture ratios in Table 422.1 results in fractional numbers, such numbers shall be rounded to the next whole number. For multiple occupancies, fractional numbers shall be first summed and then rounded to the next whole number.~~

~~**422.1.1 Family or Assisted-Use Toilet and Bathing Facilities.** Where family or assisted-use toilet and bathing rooms are required, in applicable building regulations, the facilities shall be installed in accordance with those regulations.~~

~~**422.2 Separate Facilities.** Separate toilet facilities shall be provided for each sex.~~

~~Exceptions:~~

~~(1) Residential installations.~~

~~(2) In occupancies with a total occupant load of 10 or less, including customers and employees, one toilet facility, designed for use by no more than one person at a time, shall be permitted for use by both sexes.~~

~~(3) In business and mercantile occupancies with a total occupant load of 50 or less including customers and employees, one toilet facility, designed for use by no more than one person at a time, shall be permitted for use by both sexes.~~

~~**422.3 Fixture Requirements for Special Occupancies.** Additional fixtures shall be permitted to be required where unusual environmental conditions or referenced activities are encountered. In food preparation areas, fixture requirements shall be permitted to be dictated by health codes.~~

~~**422.4 Toilet Facilities Serving Employees and Customers.** Each building or structure shall be provided with toilet facilities for employees and customers. Requirements for customers and employees shall be permitted to be met with a single set of restrooms accessible to both groups.~~

~~Required toilet facilities for employees and customers located in shopping malls or centers shall be permitted to be met by providing a centrally located toilet facility accessible to several stores. The maximum travel distance from entry to any store to the toilet facility shall not exceed 300 feet (91.440 m).~~

~~Required toilet facilities for employees and customers in other than shopping malls or centers shall have a maximum travel distance not to exceed 500 feet (152.4 m).~~

~~**422.4.1 Access to Toilet Facilities.** In multi-story buildings, accessibility to the required toilet facilities shall not exceed one vertical story. Access to the required toilet facilities for customers shall not pass through areas designated as for employee use only such as kitchens, food preparation areas, storage rooms, closets, or similar spaces. Toilet facilities accessible only to private offices shall not be counted to determine compliance with this section.~~

~~**422.5 Toilet Facilities for Workers.** Toilet facilities shall be provided and maintained in a sanitary condition for the use of workers during construction.~~

**SONAR:** Section 422.0 is proposed for deletion in its entirety. Minimum fixture requirements are regulated in SBC and other licensing codes and not the Plumbing Code.

12/10/2013: Accept language as presented

443 Lafayette Road N.  
St. Paul, Minnesota 55155  
www.dli.mn.gov



MINNESOTA DEPARTMENT OF  
**LABOR & INDUSTRY**

(651) 284-5005  
1-800-DIAL-DLI  
TTY: (651) 297-4198

**NATIONAL CODE COMMITTEE COMMENT FORM**  
**FOR PROPOSED AMENDMENTS TO THE UPC**  
(This form must be submitted electronically)

*Author/requestor:* John Parizek

*Email address:* jparizek@dunwoody.edu

*Telephone number:* 612-581-1314

*Firm/Association affiliation, if any:* Plumbing Board

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**Proposed Code Change - Language**

Please provide your proposed UPC amendment in ~~strikeout~~/underline format. Provide the *specific* language you would like to see changed, with new words underlined and words to be deleted should be ~~stricken~~. Also, state whether the language contained in your proposal is from a code book or from an amendment currently found in Minnesota Rule. (You may provide the language (electronically) on a separate, attached sheet).

~~505.4.4 Single-Wall Heat Exchanger. Indirect-fired water heater that incorporate a single-wall heat exchanger shall meet the following requirements:~~

- ~~(1) Connected to a low-pressure hot water boiler limited to a maximum of 30 pounds-force per square inch gauge (psig) (207 kPa) by an approved safety or relief valve.~~
- ~~(2) Heater transfer medium is either potable water or contains fluids having a toxicity rating or Class of 1.~~
- ~~(3) Bear a label with the word "Caution," followed by the following statements:~~
  - ~~(a) The heat-transfer medium shall be water or other nontoxic fluid having a toxic rating or Class of 1 as listed in Clinical Toxicology of Commercial Products, 5th edition.~~
  - ~~(b) The pressure of the heat-transfer medium shall be limited to a maximum of 30 psig (207 kPa) by an approved safety or relief valve.~~

~~The word "Caution" and the statements in letters shall have an uppercase height of not less than 0.120 of an inch (3.048 mm). The vertical spacing between lines of type shall be not less than 0.046 of an inch (1.168 mm). Lowercase letters shall be compatible with the uppercase letter-size specification.~~

~~603.5.4 Heat Exchangers. Heat exchangers used for heat transfer, heat recovery, or solar heating shall protect the potable water system from being contaminated by the heat-transfer medium. Single-wall heat exchangers used in indirect-fired water heaters shall meet the requirements of Section 505.4.4.~~

~~603.5.4.1 Single-Wall Heat Exchanger. Indirect-fired water heater that incorporate a installation of a single-wall heat exchanger shall meet all of the following requirements:~~

- ~~(1) Connected to a low-pressure hot water boiler limited to a maximum of 30 pounds-force per square inch gauge (psig) (207 kPa) by an approved safety or relief valve.~~
- ~~(2) Heater transfer medium is either potable water or contains fluids having a toxicity rating or Class of 1.~~
- ~~(3) Bear a label with the word "Caution," followed by the following statements:~~
  - ~~(a) The heat-transfer medium shall be water or other nontoxic fluid having a toxic rating or Class of 1 as listed in Clinical Toxicology of Commercial Products, 5th edition.~~
  - ~~(b) The pressure of the heat-transfer medium shall be limited to a maximum of 30 psig (207 kPa) by an approved safety or relief valve.~~

The word "Caution" and the statements in letters shall have an uppercase height of not less than 0.120 of an inch (3.048 mm). The vertical spacing between lines of type shall be not less than 0.046 of an inch (1.168 mm). Lowercase letters shall be compatible with the uppercase letter size specification.  
(4) A reduced-pressure principle backflow prevention assembly shall be installed on the building supply before the first branch.

**603.5.4.2 Double-Wall Heat Exchanger.** Double-wall heat exchangers shall separate the potable water from the heat-transfer medium by providing a space between the two walls that are vented to the atmosphere.

**Proposed Code Change – Need and Reason**

Please provide a thorough explanation of the need for this amendment and why this proposed amendment is a reasonable change. During the rulemaking process, the Agency must defend the need and reasonableness of all its proposed changes. The Agency must submit evidence that it has considered all aspects of the proposal. (You may provide the need and reason (electronically) on a separate attached sheet).

Section 603.5.4 addresses requirements for heat exchangers and refers to section 505.4.1 for single-wall heat exchangers. Section 505.4.1 has been blended into section 603.5.4 to avoid repetition and 505.4.1 deleted. A concern with single-wall heat exchangers has always been the replacement of the heat transfer medium with a higher toxicity rated substance after the initial installation. By requiring the installation of a properly maintained reduced-pressure principle backflow prevention assembly on the building water supply, upstream of the first branch, the possible contamination of the potable water supply will be eliminated. Any contamination of the potable water due to failure of a single-wall heat exchanger will be contained within the building.

**Proposed Code Change – Cost/Benefit Analysis**

Please consider whether this proposed amendment will increase/decrease costs or indicate that it will not have any cost implications and explain how it will not. If there is an increased cost, will this cost be offset somehow by a life safety or other benefit? If so, please explain. Are there any cost increases/decreases to enforce or comply with this proposed code change? If so, please explain. (You may provide the cost/benefit analysis (electronically) on a separate, attached sheet).

There would be no additional cost since installation of a single-wall heat exchanger is an optional. This amendment to the UPC is also less restrictive than existing Minnesota Plumbing Code, part 4715.1941, subpart 3 and more cost effective. In addition, the potable water supply will have added protection.

Handed out to board - goes with Exh. 14



INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS

505.4.1, 603.5.4 to 603.5.4.2

Dear John Parizek, MN Plumbing Board Chair,

December 9th, 2013

A Toxicity Rating or Class of 1 means essentially (practically) nontoxic requiring an oral dose more than 15 grams per kilogram (or 0.24 ounces per pound) to be lethal for 50 percent of humans. Keep in mind that any substance can potentially be toxic depending on the amount ingested and the particular organism. For example, chocolate is moderately toxic to dogs but minimally to other animals. Vitamins, if ingested in very large quantities, can be toxic to humans.

Here is the toxicity rating/class breakdown for humans (70 kg or 154 pounds body weight) from the Clinical Toxicology of Commercial Products based on oral dose:

Rating/Class	Dose
6. Super toxic	<5mg/kg ..
5. Extremely toxic	5-50mg/kg
4. Very toxic	50-500 mg/kg 0.5-5g/kg
3. Moderately toxic	5-15 g/kg
2. Slightly toxic	>15g/kg
1. Practically nontoxic	

IAPMO does not recommend or endorse the following, however, some possible examples of essentially nontoxic heat transfer mediums may be:

Potable Water Propylene Glycol

Mineral oil (Food Grade) Glycerine (Food Grade) Polydimethylsiloxane Freon

Substances which are recognized as safe by the U.S. Food and Drug Administration

Respectfully,

Matthew B Marciniak, IAPMO Field Manager 4528A  
W Oklahoma Av  
Milwaukee, WI 53219  
262.501.3992  
matthew.marciniak@iapmo.org

12/10/2013: Motion to NOT accept the proposed additional language

## NATIONAL CODE COMMITTEE COMMENT FORM FOR RECOMMENDED AMENDMENTS TO THE UPC

*Author/requestor:* Minnesota Department of Health

*Email address:* ronald.thompson@state.mn.us

*Telephone number:* (651) 201-3658

*Firm/Association affiliation, if any:*

### **Recommended Code Change - Language**

Please provide your recommended UPC amendment in strikeout/underline format. Provide the *specific* language you would like to see changed, with new words underlined and words to be deleted should be ~~stricken~~. Also, state whether the language contained in your proposal is from a code book or from an amendment currently found in Minnesota Rule. (You may provide the language (electronically) on a separate, attached sheet).

XXXX.XXXX CHAPTER 6, WATER SUPPLY AND DISTRIBUTION

UPC Section 610.3 is amended as follows:

**610.3 Quantity of Water.** The quantity of water required to be supplied to every plumbing fixture shall be represented by fixture units, as shown in Table 610.3 except for well water systems that are incapable of supplying the calculated quantity. Equivalent fixture values shown in Table 610.3 include both hot and cold water demand.

### **Recommended Code Change – Need and Reason**

Please provide a thorough explanation of the need for this amendment and why this recommended amendment is a reasonable change. During the rulemaking process, the Agency must defend the need and reasonableness of all its recommended changes. The Agency must submit evidence that it has considered all aspects of the proposal. (You may provide the need and reason (electronically) on a separate attached sheet).

Some areas of Minnesota, typically in the northeast and southwest parts of the state have inadequate groundwater resources to supply sustained water yields. Wells may only produce 1 gallon per minute or less. In these cases, larger storage or pressure tanks can provide some relief but cannot practically or financially provide a sustained yield of 10 gallons per minute or more depending on the use.

### **Recommended Code Change – Cost/Benefit Analysis**

Please consider whether this recommended amendment will increase/decrease costs or indicate that it will not have any cost implications and explain how it will not. If there is an increased cost, will this cost be offset somehow by a life safety or other benefit? If so, please explain. Are there any cost increases/decreases to enforce or comply with this recommended code change? If so, please explain. (You may provide the cost/benefit analysis (electronically) on a separate, attached sheet).

The recommended amendment will reduce costs in some instances.

**Other Factors to Consider Related to Recommended Amendment**

1. Is this recommended code change meant to:

change language contained in a published code book? If so, list section(s).  
The recommended change amends Section 610.3.

change language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

delete language contained in a published code book? If so, list section(s).

delete language contained in an existing amendment in Minnesota Rule? If so, list Rule part(s).

neither; this language will be new language, not found in the code book or in Minnesota Rule.

2. Is this recommended code change required by a Minnesota Statute or new legislation? If so, please provide the citation to the Statute or legislation.  
no

3. Will this recommended code change impact other sections of a published code book or of an amendment in Minnesota Rule? If so, please list the affected sections or rule parts.  
no

4. Will this recommended code change impact other parts of the Minnesota State Building Code? If so, please list the affected parts of the Minnesota State Building Code.  
no

5. Who are the parties affected or segments of industry affected by this recommended code change?  
Persons with low yielding water supplies

6. Can you think of other means or methods to achieve the purpose of the recommended code change? If so, please explain what they are and why your recommended change is the preferred method or means to achieve the desired result.  
no

7. Are you aware of any federal requirement or regulation related to this recommended code change? If so, please list the regulation or requirement.  
no

Motion to accept as presented, striking the underlined word drinking in 611.0, 611.1, 611.1.1, 611.1.2, 611.2, 611.3, and include the exception to 611.1.2, as shown below:

Add Exception to 611.1.2, as follows:

Exception: Equipment intended to treat water for non-potable uses other than drinking that are protected by an approved backflow device, assembly or method as required in Chapter 6 of this code.

**611.0 Drinking Water Conditioning Equipment.**

**611.1 Application.** Drinking Water conditioning equipment shall comply with the ~~standards~~ requirements in this section.

**611.1.1 Definition.** Drinking Water conditioning equipment means any appliance, appurtenance, or fixture, or any combination thereof, designed to treat potable water, so as to alter, modify, add, or remove any minerals chemicals, or bacteria contained in water. Drinking Water conditioning equipment includes but is not limited to ion exchange water softeners, backwashing water filters, oxidizing water filters, cartridge filters, chemical feed cartridges, ultraviolet lights, and equipment for reverse osmosis, ultrafiltration, nanofiltration, pH adjustment, nitrate and arsenic removal and adsorption onto activated carbon.

**611.1.2 Manufacture and Assembly.** Drinking water conditioning equipment may be manufactured as a complete system or may be assembled as a complete system by a licensed plumber or licensed water conditioning contractor using various types of drinking water conditioning equipment. Wetted materials used in ~~drinking~~ water conditioning equipment shall comply with ANSI/NSF61 standards or the equipment shall comply with the applicable NSF standards as listed in 1401.1.

**Exception:** Equipment intended to treat water for non-potable uses other than drinking that are protected by an approved backflow device, assembly or method as required in Chapter 6 of this code

**611.1.3 Labeling.** All water conditioning equipment must be labeled by the manufacturer, licensed plumber or by the licensed water conditioning contractor who ~~designed, constructed~~ manufactured or assembled the equipment so as to clearly identify the type of equipment and the name and address of the manufacturer, licensed plumber or licensed contractor who ~~designed, constructed~~ manufactured or assembled the equipment.

**611.2 Airgap Discharge.** Any discharge from drinking water conditioning equipment shall enter the drainage system through an airgap in accordance with Table 603.3.1 or an airgap device in accordance with Table 603.2, NSF 58, or IAPMO PS 65. ~~Salt regenerating and backwashing water treatment equipment are low hazard devices and require no more backflow protection than provided by a properly sized airgap in accordance with Table 603.3.1.~~

**611.3 Connection Tubing.** The tubing to and from **drinking** water conditioning equipment shall be of a size and material as recommended by the manufacturer. The tubing shall comply with the requirements of NSF 14, NSF 42, NSF 44, NSF 53, NSF 55, NSF 58, NSF 62 or the appropriate material standards referenced in Table 1401.1.

**611.4 Sizing of Residential Softeners.** Residential-use water softeners shall be sized in accordance with Table 611.4.

**TABLE 611.4  
SIZING OF RESIDENTIAL WATER SOFTENERS<sup>4</sup>**

<b>REQUIRED SIZE OF SOFTENER CONNECTION (inches)</b>	<b>NUMBER OF BATHROOM GROUPS SERVED<sup>1</sup></b>
3/4	Up to 2 <sup>2</sup>
1	Up to 4 <sup>3</sup>

For SI units: 1 inch = 25 mm

**Notes:**

- <sup>1</sup> Installation of a kitchen sink and dishwasher, laundry tray, and automatic clothes washer permitted without additional size increase.
- <sup>2</sup> An additional water closet and lavatory permitted.
- <sup>3</sup> Over four bathroom groups, the softener size shall be engineered for the specific installation.
- <sup>4</sup> See also Appendix A, Recommended Rules for Sizing the Water Supply System, and Appendix C, Alternate Plumbing Systems, for alternate methods of sizing water supply systems.

GP:3496011

Plumbing Board  
c/o Department of Labor and Industry  
443 Lafayette Road North  
Saint Paul, MN 55155-4344  
[dli.cclboards@state.mn.us](mailto:dli.cclboards@state.mn.us)

**NATIONAL CODE REVIEW COMMITTEE SUGGESTION FORM**

(This form must be submitted electronically)

Author/requestor: Cathy Tran

Email address: [cathy.tran@state.mn.us](mailto:cathy.tran@state.mn.us)

Telephone number: 651/284-5898

Firm/Association affiliation, if any: DLI

Section 710.13  
Motion to accept new language and stricken, as presented

Section 715.3  
Motion to accept as presented

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**Suggested Code Change - Language**

Please provide your suggested change using a strikeout and underline format. Provide the *specific* language you would like to see changed, with new words underlined and ~~strikeout~~ the words to be deleted. Tell us whether the language you are suggesting or changing is from a code book or from Minnesota Rules, chapter 4715. (You may provide the language (electronically) on a separate attached sheet).

**2012 UPC Chapter 7, Sanitary Drainage**-See attached documents.

**Suggested Code Change – Need and Reason**

Please provide a thorough explanation of the need for the suggested change and why the change is a reasonable one. During the rulemaking process, the Board must defend the need for and reasonableness of all its proposed changes. (You may provide the need and reason (electronically) on a separate attached sheet).

See attached documentation.

**Suggested Code Change – Cost/Benefit Analysis**

Please explain whether the change you suggest will increase or decrease costs, or that the change will not have any cost implications. If there is an increased cost, will this cost be offset somehow by a life-safety or other benefit? If so, please explain. Are there any cost increases or decreases to enforce or comply with the suggested change? If so, please explain. (You may provide the cost/benefit analysis (electronically) on a separate attached sheet).

No cost implications.

**710.13 Macerating Toilet Systems.** Listed macerating toilet systems shall be permitted as an alternate to a sewage pump system, ~~where approved by the Authority Having Jurisdiction.~~ A macerating toilet system may only be installed in one- or two-family dwellings when gravity flow is not possible. Not more than one bathroom group, consisting of a toilet, a lavatory, and a shower or bathtub, may discharge into a macerating toilet system. Components of macerating toilet systems shall be accessible.

**715.3 Existing Sewers.** Replacement of existing building sewers and building storm sewers using cured-in-place pipe lining trenchless methodology and materials shall be installed in accordance with ASTM F 1216. Replacement using cured-in-place pipe liners must not be used on collapsed piping or when the existing piping is compromised to a point where the installation of the liners will not eliminate hazardous or insanitary conditions.

**SONAR:** This amendment would add conditions where the existing sewers are significantly damaged and using cured-in-place lining technology must not be used. This is necessary to clarify that some existing sewers are substantially damaged, collapsed, or compromised to the point that lining will not provide sufficient remedy to eliminate insanitary conditions. Replacement with code approved pipe materials may be necessary in those cases.

All language was accepted as presented, with the modification to Section 814.3 as follows: "or to a place of disposal approved by ~~the rules governed by~~ the Minnesota Pollution Control Agency."

**Exhibit 32**

## **NATIONAL CODE REVIEW COMMITTEE SUGGESTION FORM**

(This form must be submitted electronically)

*Author/requestor:* Cathy Tran

*Email address:* cathy.tran@state.mn.us

*Telephone number:* 651/284-5898

*Firm/Association affiliation, if any:* DLI

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### **Suggested Code Change - Language**

Please provide your suggested change using a ~~strikeout~~ and underline format. Provide the *specific* language you would like to see changed, with new words underlined and ~~strikeout~~ the words to be deleted. Tell us whether the language you are suggesting or changing is from a code book or from Minnesota Rules, chapter 4715. (You may provide the language (electronically) on a separate attached sheet).

**2012 UPC Chapter 8, Indirect Wastes**-See attached document.

### **Suggested Code Change – Need and Reason**

Please provide a thorough explanation of the need for the suggested change and why the change is a reasonable one. During the rulemaking process, the Board must defend the need for and reasonableness of all its proposed changes. (You may provide the need and reason (electronically) on a separate attached sheet).

See attached documentation.

### **Suggested Code Change – Cost/Benefit Analysis**

Please explain whether the change you suggest will increase or decrease costs, or that the change will not have any cost implications. If there is an increased cost, will this cost be offset somehow by a life-safety or other benefit? If so, please explain. Are there any cost increases or decreases to enforce or comply with the suggested change? If so, please explain. (You may provide the cost/benefit analysis (electronically) on a separate attached sheet).

No cost implications.

**Please explain:**

1. Is the suggested change meant to:

x change language contained in a published code book? If so, list section(s).

change language contained in an existing Minnesota Rule in chapter 4715? If so, list the Rule part(s).

delete language contained in a published code book? If so, list section(s).

delete language contained in an existing Minnesota Rule in chapter 4715? If so, list Rule the part(s).

neither; the suggested change is new language and is not in a code book or in Minnesota Rules, chapter 4715.

2. Is the suggested change required by a federal requirement or regulation, state statute or new legislation? If so, please explain and provide the citation to the regulation, statute or legislation.  
MN Statutes 326b.43

3. Will the suggested change impact other sections of a published code book or the Minnesota State Building Code or other administrative rules? If so, please list the affected sections or rule parts.

4. Who are the parties affected or segments of industry that might be affected by the suggested change?

5. Can you think of other means or methods to achieve the purpose of the suggested change? If so, please explain what they are and why your suggested change is the preferred method or means to achieve the desired result.

no

6. Are you aware of any federal requirement or regulation related to this proposed code change? If so, please list the regulation or requirement.

No

## CHAPTER 8 - 2012 UPC DLI Recommended changes

### Chapter 8 Indirect Waste- Proposed Amendments

**801.2.2 Walk-In Coolers.** Floor drains shall not be located inside walk-in coolers unless they are specifically required by the licensing authority. ~~For walk-in coolers,~~ Where required, floor drains shall be permitted to be connected to a separate drainage line discharging into an outside receptor. The flood-level rim of the receptor shall be not less than 6 inches (152 mm) lower than the lowest floor drain. Such floor drains shall be trapped and individually vented. Cleanouts shall be provided at 90 degree (1.57 rad) turns and shall be accessibly located. Such waste shall discharge through an air gap or air break into a trapped and vented receptor, except that a full-size air gap is required where the indirect waste pipe is under vacuum.

**SONAR:** This section is amended to address licensing requirements and provide consistency with licensing regulations to only allow floor drains inside walk in coolers when required.

**801.2.3 Food-Handling Fixtures.** ~~Food preparation sinks,~~ cooking ranges, steam kettles, potato peelers, ice cream dipper wells, and similar equipment shall be indirectly connected to the drainage system by means of an air gap. ~~Bins, sinks, cooling counters, compartments,~~ receptacles, and other equipment having drainage connections and used for the storage of unpackaged ice used for human ingestion, or used in direct contact with ready-to-eat food, shall be indirectly connected to the drainage system by means of an air gap. Each indirect waste pipe from food-handling fixtures, storage or holding compartments, or equipment shall be separately trapped and piped to the indirect waste receptor and shall not combine with other indirect waste pipes. The piping from the equipment to the receptor shall be not less than the drain on the unit, and in no case less than  $\frac{1}{2}$  ~~2~~  $\frac{3}{4}$  of an inch (~~15~~ 20mm).

**SONAR:** This section is amended to add similar related food storage compartments provide consistency with licensing regulations and clarify that the indirect piping must be trapped to prevent insects or living creatures from crawling into the food compartments.

**801.3 Bar and Fountain Sink Traps.** ~~Where the sink in a bar, soda fountain, or counter is so located that the trap serving the sink cannot be vented, the sink drain shall discharge through an air gap or air break (see Section 801.2.3) into an approved receptor that is vented. The developed length from the fixture outlet to the receptor shall not exceed 5 feet (1524 mm).~~

**SONAR:** Repealed. This section is proposed to be deleted in its entirety. Bar sinks must be at all times directly connected and vented properly for sanitation purpose and maintain consistent with the licensing authority's requirements. When a conventional vent is not possible, there are other options to venting in this code.

### **804.2 Domestic or Culinary Type Fixtures prohibited as receptors.**

No plumbing fixture which is used for domestic or culinary purposes shall be used to receive the discharge of an indirect waste. Domestic use dishwashers may discharge into a sink, or discharge to a sink tailpiece or food-waste grinder when installed in accordance with section 807.4.

**SONAR: 804.2** This amendment is added to clarify that sinks that are intended for food preparation in commercial application must not receive any indirect waste piping as there is a possibility of contaminating food in sinks intended for those uses. Allowance is made recognize that dishwashers in domestic installation such as residential applications are acceptable.

### **813.0 Swimming Pools.**

**813.1 General.** Pipes carrying wastewater from swimming or wading pools, including pool drainage and backwash from filters, including water from scum gutter drains and pool deck drains shall be installed as an indirect waste. Where a pump is used to discharge waste pool water to the drainage system, the pump discharge shall be installed as an indirect waste.

**SONAR: 813.1** The amendments to this section is necessary to clarify that deck drains and water from the pool gutters must also discharge to the drainage system through an indirect connection. This is necessary to prevent possibility of any sewage back-ups into areas of the pool that will contaminate pool water.

**814.0 Condensate Wastes and Control.**

**814.1 Condensate Disposal.** Condensate from air washers, air-cooling coils, fuel-burning condensing appliances, the overflow from evaporative coolers, and similar water-supplied equipment or similar air-conditioning equipment shall be collected and discharged to an approved plumbing fixture or disposal area. Where discharged into the drainage system, equipment shall drain by means of an indirect waste pipe. The waste pipe shall have a slope of not less than 1/8 inch per foot (10.4 mm/m) or 1 percent slope and shall be of approved corrosion-resistant material ~~not smaller than the outlet size in accordance with Table 814.1 for condensing fuel-burning appliances, respectively.~~ Condensate or wastewater shall not drain over a public way.

**TABLE 814.1**

**MINIMUM CONDENSATE PIPE SIZE**

<b>EQUIPMENT CAPACITY IN TONS OF REFRIGERATION</b>	<b>MINIMUM CONDENSATE PIPE DIAMETER (inches)</b>
Up to 20	3/4
21-40	1
41-90	1 1/4
91-125	1 1/2
126-250	2

For SI units: 1 ton = 3.52 kW, 1 inch = 25 mm

**SONAR:** Table 814.1 The table is currently regulated by the mechanical code and is deleted in its entirety to avoid discrepancies and overlapping requirements.

~~**814.2 Size.** The size of condensate waste pipes is for one unit or a combination of units, or as recommended by the manufacturer. The capacity of waste pipes assumes a 1/8 inch per foot (10.4 mm/m) or 1 percent slope, with the pipe running three quarters full at the following pipe conditions:~~

~~Outside Air — 20% Room Air — 80%  
DB — WB — DB — WB  
90°F — 73°F — 75°F — 62.5°F~~

~~For SI units: °C = (°F - 32)/1.8~~

~~Condensate drain sizing for other slopes or other conditions shall be approved by the Authority Having Jurisdiction.~~

~~Air conditioning waste pipes shall be constructed of materials specified in Chapter 7.~~

**SONAR:** 814.2 Repealed. This section is regulated by the mechanical code and is deleted in its entirety.

**814.3 Point of Discharge.** Air-conditioning condensate waste pipes shall connect indirectly to the drainage system through an air gap or air break to properly trapped and vented receptors, ~~dry wells, leach pits, or the tailpiece of a plumbing fixtures~~ **or to a place of disposal approved by the rules governed by the Minnesota Pollution Control Agency.**

Condensate waste shall not drain over a public way or in areas causing nuisance.

**SONAR:** 814.3 The amendments to this section is necessary since dry wells, leach pits, or any other means of disposals that are exterior that may discharge into the waters of the states are points of disposal regulated in rules governed by the MPCA and not by the MN Plumbing Code.

## NATIONAL CODE REVIEW COMMITTEE SUGGESTION FORM

(This form must be submitted electronically)

Author/requestor: Cathy Tran

Email address: cathy.tran@state.mn.us

Telephone number: 651/284-5898

Firm/Association affiliation, if any: DLI

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### **Suggested Code Change - Language**

Please provide your suggested change using a ~~strikeout~~ and underline format. Provide the *specific* language you would like to see changed, with new words underlined and ~~strikeout~~ the words to be deleted. Tell us whether the language you are suggesting or changing is from a code book or from Minnesota Rules, chapter 4715. (You may provide the language (electronically) on a separate attached sheet).

**2012 UPC Chapter 9 Vents** - See attached document below.

### **Suggested Code Change – Need and Reason**

Please provide a thorough explanation of the need for the suggested change and why the change is a reasonable one. During the rulemaking process, the Board must defend the need for and reasonableness of all its proposed changes. (You may provide the need and reason (electronically) on a separate attached sheet).

See attached documentation.

### **Suggested Code Change – Cost/Benefit Analysis**

Please explain whether the change you suggest will increase or decrease costs, or that the change will not have any cost implications. If there is an increased cost, will this cost be offset somehow by a life-safety or other benefit? If so, please explain. Are there any cost increases or decreases to enforce or comply with the suggested change? If so, please explain. (You may provide the cost/benefit analysis (electronically) on a separate attached sheet).

No cost implications.

**Please explain:**

1. Is the suggested change meant to:

x change language contained in a published code book? If so, list section(s).

change language contained in an existing Minnesota Rule in chapter 4715? If so, list the Rule part(s).

delete language contained in a published code book? If so, list section(s).

delete language contained in an existing Minnesota Rule in chapter 4715? If so, list Rule the part(s).

neither; the suggested change is new language and is not in a code book or in Minnesota Rules, chapter 4715.

2. Is the suggested change required by a federal requirement or regulation, state statute or new legislation? If so, please explain and provide the citation to the regulation, statute or legislation.  
MN Statutes 326b.43

3. Will the suggested change impact other sections of a published code book or the Minnesota State Building Code or other administrative rules? If so, please list the affected sections or rule parts.

4. Who are the parties affected or segments of industry that might be affected by the suggested change?

5. Can you think of other means or methods to achieve the purpose of the suggested change? If so, please explain what they are and why your suggested change is the preferred method or means to achieve the desired result.

no

6. Are you aware of any federal requirement or regulation related to this proposed code change? If so, please list the regulation or requirement.

No

## CHAPTER 9 - 2012 UPC DLI Recommended changes

Accept all language as presented with modification to 906.7

### CHAPTER 9 (VENTS) Proposed Amendments

~~**902.2 Bars, Soda Fountains, and Counter.** Traps serving sinks that are part of the equipment of bars, soda fountains, and counters need not be vented where the location and construction of such bars, soda fountains, and counters is such as to make it impossible to do so. Where such conditions exist, said sinks shall discharge by means of approved indirect waste pipes into a floor sink or other approved type of receptor.~~

**SONAR:** This amendment is necessary to require all sinks are directly connected, trapped and vented accordingly. This change is also consistently with section 801.3 for proper sanitation and maintaining consistency with the licensing authority's requirements.

**903.1 Applicable Standards.** Vent pipe and fittings shall comply with the applicable standards referenced in Table 701.1, except that:

- (1) No galvanized steel or 304 stainless steel pipe shall be installed underground and shall be not less than 6 inches (152 mm) aboveground.
- (2) ABS and PVC DWV piping installations shall be in accordance with the applicable standards referenced in Table 1401.1, ~~and Chapter 15 "Firestop Protection."~~ Except for individual single-family dwelling units, materials exposed within ducts or plenums shall have a flame spread index of a maximum of 25 and a smoke developed index of not more than 50 where tested in accordance with ASTM E 84 or UL 723.

**SONAR:** This amendment would remove the reference to Chapter 15. Chapter 15 is governed by rules that are regulated by other codes and agency.

~~**905.3 Vent Pipe Rise.** Unless prohibited by structural conditions as provided elsewhere in this code, each vent shall rise vertically to a point not less than 6 inches (152 mm) above the flood-level rim of the fixture served before offsetting horizontally, and where two or more vent pipes converge, each such vent pipe shall rise to a point not less than 6 inches (152 mm) in height above the flood-level rim of the plumbing fixture it serves before being connected to any other vent. Vents less than 6 inches (152 mm) above the flood-level rim of the fixture shall be installed with approved drainage fittings, material, and grade to the drain.~~

**SONAR:** This amendment would remove the allowance of vents to be installed below 6 inches of the flood-level rim of the fixture. Proper venting is important to prevent siphoning of the traps and sewer gas to escape to the environment. This is necessary to protect public health & safety.

**906.1 Roof termination** Each vent pipe or stack shall extend through its flashing and shall terminate vertically not less than 12 ~~6 inches (152 mm)~~ above the roof ~~nor less than 1 foot (305 mm) from a vertical surface.~~

**SONAR:** This amendment is necessary to address Minnesota winter weather/snow conditions. It is common to have snow load higher than 6 inches on the roof in a typical winter in Minnesota which may block the opening of the vent pipe.

**906.3 Use of Roof.** Vent pipes shall be extended separately or combined, of full required size, not less than 12 ~~6 inches (152 mm)~~ above the roof ~~or fire wall~~. Flagpoling of vents shall be prohibited except where the roof is used for purposes other than weather protection. Vents within 10 feet (3048 mm) of a part of the roof that is used for such other purposes shall extend not less than 7 feet (2134 mm) above such roof and shall be securely stayed.

**SONAR:** Consistent with proposed changes in 906.1, this amendment is necessary to address Minnesota winter weather/snow conditions.

**DLI – 906.7: Accept with modification: Strike: ~~the minimum v~~**

**906.7 Frost or Snow Closure.** ~~Where frost or snow closure is likely to occur in locations having minimum design temperature below 0°F (-17.8°C),~~ **The minimum v** Vent terminals shall be not less than 2 inches (50 mm) in diameter, but in no event smaller than the required vent pipe. The change in diameter shall be made inside the building not less than 1 foot (305 mm) below the roof in an insulated space and terminate not less than 12 ~~40~~ inches (254 mm) above the roof, ~~or in accordance with the Authority Having Jurisdiction.~~

**SONAR:** Consistent with proposed changes in 906.1, this amendment is necessary to address Minnesota winter weather/snow conditions. In addition, clarification is made that the minimum size vent terminal is 2 inches to prevent freezing in pipes which are smaller than 2 inches. Temperatures in Minnesota winter is consistently below zero degrees Fahrenheit.

**Previous motion denied recommended language in Chapter 9 but maintained C6.0 Vent System Sizing to C6.4.2 Venting Lower Section of Appendix C as is, keeping as an appendix**

## DLI Recommended changes from previous National Code Committee meetings

### **907.0 Stack Vent, Vent Stacks and Relief Vents.**

**907.1 Drainage stack.** Each soil or waste stack that receives the discharge of fixtures located on two or more floors, and the uppermost fixtures is located three or more floors above the building drain, such stack and stack vent shall continue undiminished in size through the roof.

**907.2 Vent stack required.** Sizing of the vent system for a drainage stack that extends five branch intervals or more must be in accordance with section C6 of Appendix C. For drainage stack of 10 stories or more, part 907.3 & part 907.4 shall apply.

**SONAR 907.1 and 907.2:** The proposed language is to address the necessary venting requirements of multi-story building. This is necessary as follows:

- *The likelihood of simultaneous discharges into a drainage stack from many stories of a multi-story are high and are needed, especially, most hi-rise are apartments and office buildings with common drainage stacks and peak usage, and therefore venting of drainage stack and additional vent stacks for more than 5 stories. These requirements are necessary to handle the fluctuation of pressures in the system.*
- If this is not adopted, the code would NOT have any venting language or no requirements to address multi-story building less than 10 stories. This would leave a designer (plumber/engineer) and AHJ to determine when a vent stack is required for each drainage stack for a multi-story building, meaning a designer regardless of (engineer or plumber) must provide calculation on every project to determine pressure fluctuations for each drainage and vent stack so that the pressure differential to protect the trap seal within 1 inch water column.
- Also implies that an engineer must design all multi-story building.
- Needed for consistent requirements.

**907.4 3 Drainage Stack of 10 stories or more.** Each drainage stack that extends 10 or more stories above the building drain or other horizontal drain shall be served by a parallel vent stack, which shall extend undiminished in size from its upper terminal and connect to the drainage stack at or immediately below the lowest fixture drain. Each such vent stack shall also be connected to the drainage stack at each fifth floor, counting down from the uppermost fixture drain, by means of a yoke vent, the size of which shall be not less in diameter than either the drainage or the vent stack, whichever is smaller.

**SONAR:** The proposed language is to clarify this section will apply to drainage stacks with 10 stories or more as well as renumbering of the part accordingly. Part 907.3 addresses requirements for additional vent stack and to ensure this vent stack is full size. Both are necessary for the properly functioning of the plumbing system in this type of building.

**907.2 4 Yoke Vent.** The yoke vent connection to the vent stack shall be placed not less than 42 inches (1067 mm) above the floor level, and the yoke vent connection to the drainage stack shall be by means of a wye-branch fitting placed below the lowest drainage branch connection serving that floor.

**SONAR:** The proposed change is not substantial. It is necessary to renumber this part due to other changes in the this section.

~~**1014.3.7 Abandoned Gravity Grease Interceptors.** Abandoned grease interceptors shall be pumped and filled as required for abandoned sewers and sewage disposal facilities in Section 722.0.~~

**SONAR:** This part refers to Section 722.0. Section 722.0 has been proposed to be deleted and therefore no longer would exist in this code. Consistent with Section 722.0, this part is proposed for deletion. Abandonment of sewers and related fixtures have not been historically addressed by Plumbing Code, but rather by local ordinances for proper disposal and abandonment. If this part is not deleted, it will create conflict of requirements with local ordinances, and will many municipalities will need to revise ordinances to reflect the new requirements of the MN Plumbing Code.

## NATIONAL CODE REVIEW COMMITTEE SUGGESTION FORM

(This form must be submitted electronically)

*Author/requestor:* Cathy Tran

*Email address:* cathy.tran@state.mn.us

*Telephone number:* 651/284-5898

*Firm/Association affiliation, if any:* DLI

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### **Suggested Code Change - Language**

Please provide your suggested change using a strikeout and underline format. Provide the *specific* language you would like to see changed, with new words underlined and ~~strikeout~~ the words to be deleted. Tell us whether the language you are suggesting or changing is from a code book or from Minnesota Rules, chapter 4715. (You may provide the language (electronically) on a separate attached sheet).

**2012 UPC Chapter 10** -See attached documentation.

### **Suggested Code Change – Need and Reason**

Please provide a thorough explanation of the need for the suggested changed and why the change is a reasonable one. During the rulemaking process, the Board must defend the need for and reasonableness of all its recommended changes. (You may provide the need and reason (electronically) on a separate attached sheet).

See attached documentation.

### **Suggested Code Change – Cost/Benefit Analysis**

Please explain whether the change you suggest will increase or decrease costs, or that the change will not have any cost implications. If there is an increased cost, will this cost be offset somehow by a life-safety or other benefit? If so, please explain. Are there any cost increases or decreases to enforce or comply with the suggested change? If so, please explain. (You may provide the cost/benefit analysis (electronically) on a separate attached sheet).

No cost implications.

**Please explain:**

1. Is the suggested change meant to:

change language contained in a published code book? If so, list section(s).

change language contained in an existing Minnesota Rule in chapter 4715? If so, list the Rule part(s).

delete language contained in a published code book? If so, list section(s).

delete language contained in an existing Minnesota Rule in chapter 4715? If so, list Rule the part(s).

neither; the suggested change is new language and is not in a code book or in Minnesota Rules, chapter 4715.

2. Is the suggested change required by a federal requirement or regulation, state statute or new legislation? If so, please explain and provide the citation to the regulation, statute or legislation.  
MN Statutes 326b.43

3. Will the suggested change impact other sections of a published code book or the Minnesota State Building Code or other administrative rules? If so, please list the affected sections or rule parts.

4. Who are the parties affected or segments of industry that might be affected by the suggested change?

5. Can you think of other means or methods to achieve the purpose of the suggested change? If so, please explain what they are and why your suggested change is the preferred method or means to achieve the desired result.  
no

6. Are you aware of any federal requirement or regulation related to this recommended code change? If so, please list the regulation or requirement.  
No

All language accepted as presented, with amendment to 1014.3.7 to read as follows:

**1014.3.7 Abandoned Gravity Grease Interceptors.**

“Abandoned grease interceptors shall be pumped and filled as required **for abandoned sewers and sewage disposal facilities in Section 722.0 per the authority having jurisdiction.**”

## CHAPTER 10 - 2012 UPC DLI Recommended changes

### Chapter 10 Recommended Amendments:

**1001.1 Where Required.** Each plumbing fixture shall be separately trapped by an approved type of liquid seal trap. This section shall not apply to fixtures with integral traps. Not more than one trap shall be permitted on a trap arm. Food waste disposal units installed with a set of restaurant, commercial, or industrial sinks shall be connected to a separate trap. Each domestic clothes washer and each laundry tub shall be connected to a separate and independent trap, except that ~~a trap serving~~ a laundry tub shall be permitted to also receive the waste from a clothes washer set adjacent thereto. The vertical distance between a fixture outlet and the trap weir shall be as short as practicable, but in no case shall the tailpiece from a fixture exceed 24 inches (610 mm) in length. One trap shall be permitted to serve a set of not more than three single compartment sinks or laundry tubs of the same depth or three lavatories immediately adjacent to each other and in the same room where the waste outlets are not more than 30 inches (762 mm) apart and the trap is centrally located where three compartments are installed.

**Sonar:** The recommended change is to clarify that a laundry tub is a receptor and may receiving the indirect waste discharge from a clothes washer. As written and without proposing the change, it may be interpreted that a trap of a laundry tub to receive discharges from a clothes washer adjacent to it. Concerns of having physical connection into the trap of the laundry tub would siphon dirty waste from the laundry tub or its trap during the clothes washer spinning cycle.

**1009.2 Approval.** The size, type, and location of each interceptor (clarifier) or separator shall meet the requirements of this chapter, except for interceptors or separators which are engineered and manufactured and which are documented by the manufacturer and the project design engineer to be properly designed and sized for the specific project, and ~~be approved by the Authority Having Jurisdiction.~~ Except where otherwise specifically permitted, no wastes other than those requiring treatment or separation shall be discharged into an interceptor (clarifier).

**Sonar:** The recommended change is to clarify that engineered units are acceptable and are needed for special uses or designs where interceptors that are approved in this chapter would not address the needed design or special types of waste for a specific project. Therefore, the recommended change allows an option for interceptors and separators which are engineered, design, size, and manufacture for a specific use when documentation from the manufacturer and the project engineer stating the interceptor is properly designed and sized for the specific project.

~~**1014.3.7 Abandoned Gravity Grease Interceptors.** Abandoned grease interceptors shall be pumped and filled as required for abandoned sewers and sewage disposal facilities in Section 722.0.~~

**Sonar:** This section refers to Section 722.0. Section 722.0 has been recommended to be deleted and therefore no longer would exist in this code. Consistent with Section 722.0, this part is recommended for deletion since private sewage treatment regulations are governed by the MPCA rules and not the MN Plumbing Code.

*Delete languages in 1017.1 and 1017.2 entirely and replace with recommended changes:*

**1017.0 Oil and Flammable Liquid Interceptors.**

The National Code Review Committee recommended striking the underlined language and un-striking the stricken language, with the following friendly amendment to read as follows:

### 1017.2 Design of Interceptors.

~~Oil separators are to be designed to the standards as listed in chapter 14.~~ Each manufactured interceptor that is rated shall be stamped or labeled by the manufacturer with an indication of its full discharge rate in gpm (L/s). The full discharge rate to such an interceptor shall be determined at full flow. Each interceptor shall be rated equal to or greater than the incoming flow. ~~and shall be provided with an overflow line to an underground tank.~~

IAPMO PS80 Standards were reviewed and due to time constraints, chapter 10 was tabled.

Motion to deny recommended language by DLI and keep UPC language, with the following friendly amendment:

### 1017.2 Design of Interceptors.

Oil separators are to be designed to the standards as listed in chapter 14. Each manufactured interceptor that is rated shall be stamped or labeled by the manufacturer with an indication of its full discharge rate in gpm (L/s). The full discharge rate to such an interceptor shall be determined at full flow. Each interceptor shall be rated equal to or greater than the incoming flow. ~~and shall be provided with an overflow line to an underground tank.~~

~~1017.1 Interceptors Required. Repair garages and gasoline stations with grease racks or grease pits, and factories that have oily, flammable, or both types of wastes as a result of manufacturing, storage, maintenance, repair, or testing processes, shall be provided with an oil or flammable liquid interceptor that shall be connected to necessary floor drains. The separation or vapor compartment shall be independently vented to the outer air. Where two or more separation or vapor compartments are used, each shall be vented to the outer air or shall be permitted to connect to a header that is installed at a minimum of 6 inches (152 mm) above the spill line of the lowest floor drain and vented independently to the outer air. The minimum size of a flammable vapor vent shall be not less than 2 inches (51 mm), and, where vented through a sidewall, the vent shall be not less than 10 feet (3048 mm) above the adjacent level at an approved location. The interceptor shall be vented on the sewer side and shall not connect to a flammable vapor vent. Oil and flammable interceptors shall be provided with gastight cleanout covers that shall be readily accessible. The waste line shall be not less than 3 inches (80 mm) in diameter with a full size cleanout to grade. Where an interceptor is provided with an overflow, it shall be provided with an overflow line [not less than 2 inches (50 mm) in diameter] to an approved waste oil tank having a minimum capacity of 550 gallons (2082 L) and meeting the requirements of the Authority Having Jurisdiction. The waste oil from the interceptor shall flow by gravity or shall be pumped to a higher elevation by an automatic pump. Pumps shall be adequately sized and accessible. Waste oil tanks shall have a 2 inch (50 mm) minimum pump out connection at grade and a 1<sup>+</sup>/<sub>2</sub> inch (38 mm) minimum vent to atmosphere at an approved location not less than 10 feet (3048 mm) above grade.~~

~~1017.2 Design of Interceptors. Each manufactured interceptor that is rated shall be stamped or labeled by the manufacturer with an indication of its full discharge rate in gpm (L/s). The full discharge rate to such an interceptor shall be determined at full flow. Each interceptor shall be rated equal to or greater than the incoming flow and shall be provided with an overflow line to an underground tank.~~

~~Interceptors not rated by the manufacturer shall have a depth of not less than 2 feet (610 mm) below the invert of the discharge drain. The outlet opening shall have not less than an 18 inch (457 mm) water seal and shall have a minimum capacity as follows: Where not more than three motor vehicles are serviced, stored, or both, interceptors shall have a minimum capacity of 6 cubic feet (0.2 m<sup>3</sup>), and 1 cubic foot (0.03 m<sup>3</sup>) of capacity shall be added for each vehicle up to 10 vehicles. Above 10 vehicles, the Authority Having Jurisdiction shall determine the size of the interceptor required. Where vehicles are serviced and not stored, interceptor capacity shall be based on a net capacity of 1 cubic foot (0.03 m<sup>3</sup>) for each 100 square feet (9.29 m<sup>2</sup>) of surface to be drained into the interceptor, with a minimum of 6 cubic feet (0.2 m<sup>3</sup>).~~

### 1017.0 Oil and Flammable Liquid Interceptors.

1017.1 Interceptors Required. Enclosed garages of over 1,000 square feet or housing more than four motor vehicles, repair garages, gasoline stations with grease racks, work or wash racks, auto washes, and all buildings where oily and/or flammable liquid wastes are produced as a result of manufacturing, storage, maintenance, repair, or testing processes shall have an interceptor installed into which all oil, grease, and sand bearing and/or flammable wastes shall be discharged before emptying into the building drainage system or other point of disposal, when floor drains or trench drains are provided. The interceptor shall be located inside the building.

Exception: Private garages serving one- and two-family dwellings.

**1017.2 Design of Interceptors.** Each interceptor shall be of watertight construction and of not less than 35 cubic feet holding capacity, be provided with a water seal of not less than three inches on the inlet and not less than 18 inches on the outlet. The minimum depth below the invert of the discharge drain shall be three feet. The minimum size of the discharge drain shall be four inches. The interceptor may be constructed either: (i) of monolithic poured reinforced concrete with a minimum floor and wall thickness of six inches with protected treatment approved by the manufacturer for the intended use (ii) of iron or steel of a minimum thickness of 3/16 inch, protected with an approved corrosion resistant coating on both the inside and the outside, or (iii) of fiberglass resins that comply with ASTM C-581 and meets IAPMO Material and Property Standard, PS 80-2003b, for clarifiers.

The interceptor must be provided with a nonperforated iron or steel cover and ring of not less than 24 inches in diameter, and the air space in the top of the tank must have a three-inch vent pipe, constructed of approved metallic material, extending separately to a point at least 12 inches above the roof of the building. Drains and piping from motor vehicle areas must be a minimum of three inches in size. Drains discharging to an interceptor must not be trapped and must be constructed so as not to retain liquids. In motor vehicle wash facilities, a sand interceptor which meets the requirements of section 1016.0, except that no water seal is permitted, may be installed to receive wastes before discharging into a flammable waste interceptor.

No cleanout, mechanical joint, or backwater valve shall be installed inside the interceptor which could provide a bypass of the trap seal. Only wastes that require separation shall discharge into the interceptor, except that a water supplied and trapped sink may be connected to the vent of the interceptor. Whenever the outlet branch drain serving an interceptor is more than 25 feet from a vented drain, such branch drain shall be provided with a two inch vent pipe. A backwater valve shall be installed in the outlet branch drain whenever in the judgment of the administrative authority backflow from the building drain could occur.

**Sonar: 1017.1 and 1017.2** Recommend deleting the languages in 1017.1 and 1017.2 entirely and replace with language consistent with MN part 4715.1120. The language in 1017.1 & 1017.2 would not provide consistent administration throughout the state. The recommended new language is consistent with past requirements specific to Minnesota. Allowance for other types of interceptors which are engineered and manufactured may be entertained in recommended changes in section 1009.2. The following are reasons why 1017.1 and 1017.2 should not be adopted:

1. The language in UPC 1017.1 does not include drains in vehicle wash bays, or vehicle storage facilities/parking garages which also receive oily and flammable wastes.
2. UPC 1017.1 and 1017.2 does not clearly spelled out do not address minimum interceptor size required, would allow any size of floor drains or drainage piping upstream of the interceptor, no dry-pan design required.
3. The language in 1017.1 does not specifically reference types of construction for the interceptor nor waste oil tank but allow both which leads to maintenance of two tanks instead of one, and higher chance of leakage. Material construction and compatibility with wastes being stored needs to be addressed under the UPC
4. Minimum size and leak proof requirements of waste oil tank are not specify in 1017.1.
5. There are pumping provisions as an option for compliance without requiring fire explosion proof pumps.
6. 1017.2 for design of interceptors allows for minimum sizing of 6 gallons interceptor and mandates underground oily/flammable storage tank for overflow from the interceptor which is an added cost for owners and building pumping connection to the outside.
7. The language suggests a minimum interceptor size of 6 gallons in vehicle service garage which is substantially small and would require more frequent pump schedule even with the waste oil tank.
8. Allow traps upstream of the interceptor which is a possible fire/safety hazard.
9. Language does not provide exception for residential/single family garages.
10. Concerns of sufficient vapor vent sizes of 2-inches and allowance of venting to the side wall of the building.

**Water Reuse Group – this Exhibit 40, DRAFT 11/7/2013, was distributed at the 12/10/13 meeting and replaced Exhibit 40 found in the Recommended Code Language 2013 binder.**

## CHAPTER 16 ALTERNATE WATER SOURCES FOR NONPOTABLE APPLICATIONS

### 1601.0 General.

**1601.1 Applicability.** The provisions of this chapter shall apply to the construction, alteration, and repair of alternate water source systems for nonpotable applications.

**1601.1.1 Allowable Use of Alternate Water.** Alternate water sources shall be permitted to be used in lieu of potable water for the applications identified in this chapter.

**1601.2 System Design.** Components, piping, and fittings used in an alternate water source system shall be listed per Chapter 14 and installed per all applicable chapters of this plumbing code. Additional design requirements may be covered by other authorities or codes.

**1601.2 Irrigation.** Alternate water systems designed for irrigation is not covered under this Chapter. No irrigation here but irrigation is included in 17?

**1601.4 Component Identification.** System components shall be properly identified as to the manufacturer.

**1601.5 Maintenance and Inspection.** Alternate water source systems and components shall be inspected and maintained in accordance with Section 1601.5.1 through Section 1601.5.3.

**1601.5.1 Frequency.** Alternate water source systems and components shall be inspected and maintained in accordance with the manufacturer's recommendations unless more frequent inspection and maintenance is required by an enforcing agency.

**1601.5.2 Maintenance Log.** A maintenance log for gray water and on-site treated nonpotable water systems is required and shall be maintained by the property owner and be available for inspection. The property owner or designated appointee shall ensure that a record of testing, inspection and maintenance is maintained in the log. The log will indicate the frequency of inspection and maintenance for each system.

**1601.5.3 Maintenance Responsibility.** The required maintenance and inspection of alternate water source systems shall be the responsibility of the property owner. Additional certifications may be required by another enforcing agency.

**1601.6 Operation and Maintenance Manual.** An operation and maintenance manual for gray water and on-site treated water systems shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following:

- (1) Detailed diagram of the entire system and the location of system components.
- (2) Instructions on operating and maintaining the system.
- (4) Details on deactivating the system for maintenance, repair, or other purposes.
- (5) Applicable testing, inspection, and maintenance.
- (6) A method of contacting the manufacturer(s).

### 1607.7 Minimum Treatment Requirements

**Treatment of alternate sources is required in order to maintain satisfactory water quality and will be reviewed along with the system design.**

**Exceptions?**

**(1) Water treatment is not required for rainwater catchment systems used for aboveground irrigation with a maximum storage capacity of 360 gallons (1363 L).**

**(2) Water treatment is not required for gray water used for subsurface irrigation.**

**(3) Water treatment is not required for rainwater catchment systems used for subsurface or drip irrigation.**

**1601.8 Material Compatibility.** Alternate water source systems shall be constructed of materials that are compatible with the type of pipe and fitting materials, water treatment, and water conditions in the system. Components, piping, and fittings used in an alternate water source system shall be listed per Chapter 14 of this plumbing code.

**1601.9 System Controls.** Controls for pumps, valves, and other devices that contain mercury that come in contact with alternate water source water supply shall not be permitted.

**1601.10 Commercial, Industrial, and Institutional Restroom Signs.** A sign shall be installed in all restrooms in commercial, industrial, and institutional occupancies using gray water, and on-site treated water, for water closets, urinals, or similar uses. Each sign shall contain ½ inch letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to all users. The location of the sign(s) shall be approved by the Administrative Authority and shall contain the following text:

TO CONSERVE WATER, THIS BUILDING USES \* \_\_\_\_\_ \* TO FLUSH TOILETS AND URINALS.

**1601.10.1 Equipment Room Signs.** Each room containing gray water, and on-site treated water equipment shall have a sign posted in a location that is visible to anyone working on or near non-potable water equipment with the following wording in 1 inch letters:

CAUTION: NON-POTABLE \* \_\_\_\_\_ \*, DO NOT DRINK. DO NOT CONNECT TO DRINKING WATER SYSTEM.  
NOTICE: CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM.  
\* \_\_\_\_\_ \* Shall indicate GRAY WATER or ON-SITE TREATED WATER, accordingly.

**1601.11 Inspection and Testing.** Alternate water source systems shall be inspected and tested in accordance with Section 1601.11.1 and Section 1601.11.2.

**1601.11.1 Supply System Inspection and Test.** Alternate water source systems shall be inspected and tested in accordance with the plumbing code for testing of potable water piping.

**1601.11.2 Cross-Connection Inspection and Testing.** An inspection and test shall be performed on both the potable and alternate water source systems. The potable and alternate water source system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section 1601.11.2.1 through Section 1601.11.2.4.

**1601.11.2.1 Visual System Inspection.** Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by an individual certified to ASSE Standard 5120 as follows:

- (1) Meter locations of the alternate water source and potable water lines shall be checked to verify that no modifications were made, and that no cross-connections are visible.
- (2) Pumps and equipment, equipment room signs, and exposed piping in equipment room shall be checked.
- (3) Valves shall be checked to ensure that valve lock seals are still in place and intact. Valve control door signs shall be checked to verify that no signs have been removed.

**1601.11.2.2 Cross-Connection Test.** The procedure for determining cross-connection shall be followed by the plumbing contractor to determine whether a cross connection has occurred as follows:

- (1) The potable water system shall be activated and pressurized. The alternate water source system shall be shut down, depressurized, and drained.
- (2) The potable water system shall remain pressurized while the alternate water source system is empty. The minimum period the alternate water source system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and the alternate water source distribution systems, but in no case shall that period be less than 1 hour.
- (3) The drain on the alternate water source system shall be checked for flow during the test and all fixtures, potable and alternate water source, shall be tested and inspected for flow. Flow from any alternate water source system outlet indicates a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the alternate water source system.
- (4) The potable water system shall then be depressurized and drained.
- (5) The alternate water source system shall then be activated and pressurized.
- (6) The alternate water source system shall remain pressurized while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than 1 hour.
- (7) All fixtures, potable and alternate water source, shall be tested and inspected for flow. Flow from any potable water system outlet indicates a cross-connection. No flow from an alternate water source outlet will indicate that it is connected to the potable water system.
- (8) The drain on the potable water system shall be checked for flow during the test and at the end of the test.
- (9) If there is no flow detected in any of the fixtures which would indicate a cross-connection, the potable water system shall be re-pressurized.

**1601.11.2.3 Discovery of Cross-Connection.** In the event that a cross-connection is discovered, the following procedure shall be activated immediately:

- (1) The alternate water source piping to the building shall be shut down at the meter, and the alternate water source riser shall be drained.
- (2) Potable water piping to the building shall be shut down at the meter.
- (3) The cross-connection shall be uncovered and disconnected.
- (4) The building shall be retested following procedures listed in Section 1601.11.2.1 and Section 1601.11.2.2.
- (5) The potable water system shall be chlorinated with 50 parts-per-million (ppm) chlorine for 24 hours.
- (6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. If test results are acceptable, the potable water system shall be permitted to be recharged.

**1601.11.2.4 Annual Inspection.** An annual inspection of the alternate water source system, following the procedures listed in Section 1601.11.2.1 shall be required. Annual cross-connection testing of the alternate water source system, following the procedures listed in Section 1601.11.2.2 shall be required unless otherwise specified by the Administrative Authority. In no event shall the cross-connection test occur less than once in 5 years. Written records must be maintained and submitted to the Administrative Authority. Alternate testing requirements shall be permitted by the Administrative Authority.

**1601.12 Separation Requirements.** All underground alternate water source service piping shall be separated from the building sewer in accordance with the plumbing code. Treated non-potable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12 inch minimum vertical and horizontal separation when both pipe materials are approved for use within a building. Where

horizontal piping materials do not meet this requirement the minimum separation shall be increased to 60 inches. The potable water piping shall be installed at an elevation above the treated non-potable water piping.

**1601.13 Abandonment.** All alternate water source systems that are no longer in use or fails to be maintained in accordance with Section 1601.5 shall be abandoned. Abandonment shall comply with Section 1601.13.1 and Section 1601.13.2.

**1601.13.1 General.** Every abandoned system or part thereof covered under the scope of this chapter shall be disconnected from any remaining systems, drained, plugged, and capped per the requirements of this plumbing code.

**1601.13.2 Underground Tank.** Every underground water storage tank that has been abandoned or otherwise discontinued from use in a system covered under the scope of this chapter shall be completely drained and filled with earth, sand, gravel, concrete, or other approved material or removed in a manner approved by the Administrative Authority.

**1601.14 Sizing.** Unless otherwise provided for in this supplement, alternate water source piping shall be sized in accordance with Chapter 6 for sizing potable water piping.

## **1602.0 Gray Water Systems.**

**1602.1 General.** The provisions of this section shall apply to the construction, alteration, and repair of gray water systems.

**1602.1.1 Allowable Use of Gray Water.** Gray water shall be permitted to be used in lieu of potable water for the applications listed in 1604.1 and meet the requirements of 1602.2 through 1602.14 and the requirements listed in 1604.0 through 1604.12 for On-Site Treated Nonpotable Water Systems. Is this eliminating the use of gray water for subsurface irrigation?

Are surge tanks not allowed or just covered by other authorities?

## **1602.2 System Requirements.**

**1602.2.1 Discharge.** Gray water shall be permitted to be diverted away from a sewer as allowed by MPCA rules?.

**1602.2.3 Diversion.** The gray water system shall connect to the sanitary drainage system downstream of fixture traps and vent connections through an approved and listed gray water diverter valve per Chapter 14. The gray water diverter shall be installed in an accessible location and clearly indicate the direction of flow.

**1602.2.4 Backwater Valves.** Gray water drains subject to backflow shall be provided with a backwater valve so located as to be accessible for inspection and maintenance.

**1602.9.2 Gray Water Pipe and Fitting Materials.** Aboveground and underground building drainage and vent pipe and fittings for gray water systems shall comply with the requirements for aboveground and underground sanitary building drainage and vent pipe and fittings in this code.

**1602.9.5 Valves.** Valves shall be accessible.

**1602.9.6 Trap.** Gray water piping discharging into the surge tank or having a direct connection to the sanitary drain or sewer piping shall be downstream of an approved water seal type trap(s). Where no such trap(s) exists, an approved vented running trap shall be installed upstream of the connection to protect the building from possible waste or sewer gases.

**1602.9.7 Backwater Valve.** A backwater valve shall be installed on gray water drain connections to the sanitary drain or sewer.

**1602.14 Testing.** Building drains and vents for gray water systems shall be tested in accordance with this code.

**1604.0 On-Site Treated Nonpotable Water Systems. Somehow make this case-by-case basis? I think we want a certified operator, etc. for this one.**

**1604.1 General.** The provisions of this section shall apply to the installation, construction, alteration, and repair of on-site treated nonpotable water systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, and similar uses approved by the Administrative Authority.

**1604.2 Plumbing Plan Submission.** No permit for an on-site treated nonpotable water system shall be issued until complete plumbing plans, have been submitted in duplicate and approved by the commissioner. Additional plans may be required by other authorities.

**1604.3 System Changes.** No changes or connections shall be made to either the on-site treated nonpotable water system or the potable water system within a site containing an on-site treated nonpotable water system without approval by the commissioner (defined?).

**1604.4 Connections to Potable Water Systems.** On-site treated nonpotable water systems shall have no connection to a potable water supply.

**1604.5 Initial Cross-Connection Test.** A cross-connection test is required in accordance with Section 1604.12.2. Before the building is occupied or the system is activated, the plumbing contractor shall perform the initial cross-connection test in the presence of the proper administrative authority. The test shall be ruled successful before final approval is granted.

**1604.6 On-Site Treated Nonpotable Water System Materials.** On-site treated nonpotable water supply and distribution system materials shall comply with the requirements of this code for potable water supply and distribution systems, unless otherwise provided for in this section.

**1604.7 On-Site Treated Nonpotable Water Devices and Systems.** Devices or equipment used to treat on-site treated nonpotable water shall be listed, and labeled by a third-party certifying listing agency and approved for the intended application. Devices or equipment used to treat gray water or wastewater for non-potable water for use in water closet, urinal flushing, and similar applications shall be listed and labeled to IAPMO IGC207-2009a, NSF 350-2011. Other authorities may have additional treatment requirements.

**1604.8 On-Site Treated Nonpotable Water System Color and Marking Information.** On-site treated water systems shall have a colored background and marking information in accordance with Section 601.2 of this code.

**1604.9 Valves.** Valves, except fixture supply control valves, shall be equipped with a locking feature.

**1604.10 Design and Installation.** The design and installation of on-site treated nonpotable systems shall be in accordance with Section 1604.10.1 through Section 1604.10.5.

**1604.10.1 Listing Terms and Installation Instructions.** On-site treated nonpotable water systems shall be installed in accordance with the terms of its listing and the manufacturer's installation instructions.

**1604.10.3 Deactivation and Drainage.** The on-site treated nonpotable water system and the potable water system within the building shall be provided with the required valves, air and vacuum relief valves, or other appurtenances to allow for deactivation or drainage as required for a cross-connection test in accordance with Section 1601.11.2.2.

**1604.10.4 Near Underground Potable Water Pipe.** On-site treated nonpotable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12 inch minimum vertical and horizontal separation where both pipe materials are approved for use within a building. Where piping materials do not meet this requirement the minimum separation shall be increased to 60 inches. The potable water piping shall be installed at an elevation above the on-site treated nonpotable water piping.

**1604.11 Signs.** Signs in buildings using on-site treated nonpotable water shall comply with Section 1601.10.

**1604.12 Inspection and Testing.** On-site treated nonpotable water systems shall be inspected and tested in accordance with Section 1601.11.

Put this somewhere:

**Higher Requirements.** Nothing contained in this chapter shall be construed to prevent the Administrative Authority from requiring compliance with higher requirements than those contained herein, where such higher requirements are essential to maintain a safe and sanitary condition.

It seems to me that we would be more ready to approve the reclaimed wastewater section since by definition reclaimed wastewater is "Nonpotable water provided by a water/wastewater utility that, as a result of tertiary treatment of domestic wastewater, meets requirements of the public health Authority Having Jurisdiction for its intended uses".  
vs. on-site treated water which will need a separate operator

DLI – this Exhibit 40, DRAFT 11/7/2013, was distributed at the 12/10/13 meeting and replaced Exhibit 40 found in the Recommended Code Language 2013 binders.

## CHAPTER 16 ALTERNATE WATER SOURCES FOR NONPOTABLE APPLICATIONS

### 1601.0 General.

**1601.1 Applicability.** The provisions of this chapter shall apply to the construction, alteration, and repair of alternate water source systems for nonpotable applications.

**1601.1.1 Allowable Use of Alternate Water.** Alternate water sources shall be permitted to be used in lieu of potable water for the applications identified in this chapter.

**1601.2 System Design.** Components, piping, and fittings used in an alternate water source system shall be listed per Chapter 14 and installed per all applicable chapters of this plumbing code.

**1601.1.2 Irrigation.** Alternate water systems designed for irrigation is not covered under this Chapter.

**1601.4 Component Identification.** System components shall be properly identified as to the manufacturer.

**1601.5 Maintenance and Inspection.** Alternate water source systems and components shall be inspected and maintained in accordance with Section 1601.5.1 through Section 1601.5.3.

**1601.5.1 Frequency.** Alternate water source systems and components shall be inspected and maintained in accordance with the manufacturer's recommendations.

**1601.5.2 Maintenance Log.** A maintenance log for gray water and on-site treated nonpotable water systems is required and shall be maintained by the property owner and be available for inspection. The property owner or designated appointee shall ensure that a record of testing, inspection and maintenance in accordance with Table 1601.5 is maintained in the log. The log will indicate the frequency of inspection and maintenance for each system.

**1601.5.3 Maintenance Responsibility.** The required maintenance and inspection of alternate water source systems shall be the responsibility of the property owner.

**1601.6 Operation and Maintenance Manual.** An operation and maintenance manual for gray water and on-site treated water systems shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following:

- (1) Detailed diagram of the entire system and the location of system components.
- (2) Instructions on operating and maintaining the system.
- (3) Details on maintaining the ~~required~~ water quality.
- (4) Details on deactivating the system for maintenance, repair, or other purposes.
- (5) Applicable testing, inspection, and maintenance.
- (6) A method of contacting the manufacturer(s).

**1601.8 Material Compatibility.** Alternate water source systems shall be constructed of materials that are compatible with the type of pipe and fitting materials, water treatment, and water conditions in the system. Components, piping, and fittings used in an alternate water source system shall be listed per Chapter 14 of this plumbing code.

**1601.9 System Controls.** Controls for pumps, valves, and other devices that contain mercury that come in contact with alternate water source water supply shall not be permitted.

**1601.10 Commercial, Industrial, and Institutional Restroom Signs.** A sign shall be installed in all restrooms in commercial, industrial, and institutional occupancies using gray water, and on-site treated water, for water closets, urinals, or similar uses. Each sign shall contain ½ inch letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to all users. The location of the sign(s) shall be approved by the Administrative Authority and shall contain the following text:

TO CONSERVE WATER, THIS BUILDING USES \* \_\_\_\_\_ \* TO FLUSH TOILETS AND URINALS.

**1601.10.1 Equipment Room Signs.** Each room containing gray water, and on-site treated water equipment shall have a sign posted in a location that is visible to anyone working on or near non-potable water equipment with the following wording in 1 inch letters:

CAUTION: NON-POTABLE \* \_\_\_\_\_ \*, DO NOT DRINK. DO NOT CONNECT TO DRINKING WATER SYSTEM.  
NOTICE: CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM.

\* \_\_\_\_\_ \* Shall indicate GRAY WATER or ON-SITE TREATED WATER, accordingly.

**1601.11 Inspection and Testing.** Alternate water source systems shall be inspected and tested in accordance with Section 1601.11.1 and Section 1601.11.2.

**1601.11.1 Supply System Inspection and Test.** Alternate water source systems shall be inspected and tested in accordance with the plumbing code for testing of potable water piping.

**1601.11.2 Cross-Connection Inspection and Testing.** An inspection and test shall be performed on both the potable and alternate water source systems. The potable and alternate water source system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section 1601.11.2.1 through Section 1601.11.2.4.

**1601.11.2.1 Visual System Inspection.** Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by an individual certified to ASSE Standard 5120 as follows:

- (1) Meter locations of the alternate water source and potable water lines shall be checked to verify that no modifications were made, and that no cross-connections are visible.
- (2) Pumps and equipment, equipment room signs, and exposed piping in equipment room shall be checked.
- (3) Valves shall be checked to ensure that valve lock seals are still in place and intact. Valve control door signs shall be checked to verify that no signs have been removed.

**1601.11.2.2 Cross-Connection Test.** The procedure for determining cross-connection shall be followed by the plumbing contractor to determine whether a cross connection has occurred as follows:

- (1) The potable water system shall be activated and pressurized. The alternate water source system shall be shut down, depressurized, and drained.
- (2) The potable water system shall remain pressurized while the alternate water source system is empty. The minimum period the alternate water source system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and the alternate water source distribution systems, but in no case shall that period be less than 1 hour.
- (3) The drain on the alternate water source system shall be checked for flow during the test and all fixtures, potable and alternate water source, shall be tested and inspected for flow. Flow from any alternate water source system outlet indicates a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the alternate water source system.
- (4) The potable water system shall then be depressurized and drained.
- (5) The alternate water source system shall then be activated and pressurized.
- (6) The alternate water source system shall remain pressurized while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than 1 hour.
- (7) All fixtures, potable and alternate water source, shall be tested and inspected for flow. Flow from any potable water system outlet indicates a cross-connection. No flow from an alternate water source outlet will indicate that it is connected to the potable water system.
- (8) The drain on the potable water system shall be checked for flow during the test and at the end of the test.
- (9) If there is no flow detected in any of the fixtures which would indicate a cross-connection, the potable water system shall be re-pressurized.

**1601.11.2.3 Discovery of Cross-Connection.** In the event that a cross-connection is discovered, the following procedure shall be activated immediately:

- (1) The alternate water source piping to the building shall be shut down at the meter, and the alternate water source riser shall be drained.
- (2) Potable water piping to the building shall be shut down at the meter.
- (3) The cross-connection shall be uncovered and disconnected.
- (4) The building shall be retested following procedures listed in Section 1601.11.2.1 and Section 1601.11.2.2.
- (5) The potable water system shall be chlorinated with 50 parts-per-million (ppm) chlorine for 24 hours.
- (6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. If test results are acceptable, the potable water system shall be permitted to be recharged.

**1601.11.2.4 Annual Inspection.** An annual inspection of the alternate water source system, following the procedures listed in Section 1601.11.2.1 shall be required. Annual cross-connection testing of the alternate water source system, following the procedures listed in Section 1601.11.2.2 shall be required unless otherwise specified by the Administrative Authority. In no event shall the cross-connection test occur less than once in 5 years. Written records must be maintained and submitted to the Administrative Authority. Alternate testing requirements shall be permitted by the Administrative Authority.

**1601.12 Separation Requirements.** All underground alternate water source service piping shall be separated from the building sewer in accordance with the plumbing code. Treated non-potable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12 inch minimum vertical and horizontal separation when both pipe materials are approved for use within a building. Where horizontal piping materials do not meet this requirement the minimum separation shall be increased to 60 inches. The potable water piping shall be installed at an elevation above the treated non-potable water piping.

**1601.13 Abandonment.** All alternate water source systems that are no longer in use or fails to be maintained in accordance with Section 1601.5 shall be abandoned. Abandonment shall comply with Section 1601.13.1 and Section 1601.13.2.

**1601.13.1 General.** Every abandoned system or part thereof covered under the scope of this chapter shall be disconnected from any remaining systems, drained, plugged, and capped per the requirements of this plumbing code.

**1601.13.2 Underground Tank.** Every underground water storage tank that has been abandoned or otherwise discontinued from use in a system covered under the scope of this chapter shall be completely drained and filled with earth, sand, gravel, concrete, or other approved material or removed in a manner approved by the Administrative Authority.

**1601.14 Sizing.** Unless otherwise provided for in this supplement, alternate water source piping shall be sized in accordance with Chapter 6 for sizing potable water piping.

## **1602.0 Gray Water Systems.**

**1602.1 General.** The provisions of this section shall apply to the construction, alteration, and repair of gray water systems.

**1602.1.1 Allowable Use of Gray Water.** Gray water shall be permitted to be used in lieu of potable water for the applications listed in 1604.1 and meet the requirements of 1602.2 through 1602.14 and the requirements listed in 1604.0 through 1604.12 for On-Site Treated Nonpotable Water Systems.

## **1602.2 System Requirements.**

**1602.2.1 Discharge.** Gray water shall be permitted to be diverted away from a sewer.

**1602.2.3 Diversion.** The gray water system shall connect to the sanitary drainage system downstream of fixture traps and vent connections through an approved and listed gray water diverter valve per Chapter 14. The gray water diverter shall be installed in an accessible location and clearly indicate the direction of flow.

**1602.2.4 Backwater Valves.** Gray water drains subject to backflow shall be provided with a backwater valve so located as to be accessible for inspection and maintenance.

**1602.9.1 Surge Tanks.** Where installed, surge tanks shall be in accordance with the following:

- (1) Surge tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. Surge tanks constructed of steel shall be ~~approved by the Administrative Authority, provided such tanks are~~ in accordance with approved applicable standards.
- (2) Each surge tank shall be vented in accordance with this code. The vent size shall be determined based on the total gray water fixture units as outlined in this code.
- (3) Each surge tank shall have an access opening with lockable gasketed covers or approved equivalent to allow for inspection and cleaning.
- (4) Each surge tank shall have its rated capacity permanently marked on the unit. In addition, a sign stating GRAY WATER, DANGER — UNSAFE WATER shall be permanently marked on the holding tank.
- (5) Each surge tank shall have an overflow drain. The overflow drains shall have permanent connections to the building drain or building sewer, upstream of septic tanks. The overflow drain shall not be equipped with a shutoff valve.
- (6) The overflow drain pipes shall not be less in size than the inlet pipe. Unions or equally effective fittings shall be provided for piping connected to the surge tank.
- (7) Surge tank shall be structurally designed to withstand anticipated earth or other loads. Surge tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft<sup>2</sup>) where the tank is designed for underground installation.
- (8) Where a surge tank is installed underground, the system shall be designed so that the tank overflow will gravity drain to the existing sewer line or septic tank. The tank shall be protected against sewer line backflow by a backwater valve installed in accordance with this code.
- (9) Surge tanks shall be installed on dry, level, well-compacted soil where underground or on a level 3 inch thick concrete slab where aboveground.
- (10) Surge tanks shall be anchored to prevent against overturning where installed aboveground. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground where empty. The combined weight of the tank and hold down system shall meet or exceed the buoyancy forces of the tank.

**1602.9.2 Gray Water Pipe and Fitting Materials.** Aboveground and underground building drainage and vent pipe and fittings for gray water systems shall comply with the requirements for aboveground and underground sanitary building drainage and vent pipe and fittings in this code.

**1602.9.5 Valves.** Valves shall be accessible.

**1602.9.6 Trap.** Gray water piping discharging into the surge tank or having a direct connection to the sanitary drain or sewer piping shall be downstream of an approved water seal type trap(s). Where no such trap(s) exists, an approved vented running trap shall be installed upstream of the connection to protect the building from possible waste or sewer gases.

**1602.9.7 Backwater Valve.** A backwater valve shall be installed on gray water drain connections to the sanitary drain or sewer.

**1602.14 Testing.** Building drains and vents for gray water systems shall be tested in accordance with this code.

## **1604.0 On-Site Treated Nonpotable Water Systems.**

**1604.1 General.** The provisions of this section shall apply to the installation, construction, alteration, and repair of on-site treated nonpotable water systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, and similar uses approved by the Administrative Authority.

**1604.2 Plumbing Plan Submission.** No permit for an on-site treated nonpotable water system shall be issued until complete plumbing plans, have been submitted in duplicate and approved by the commissioner.

**1604.3 System Changes.** No changes or connections shall be made to either the on-site treated nonpotable water system or the potable water system within a site containing an on-site treated nonpotable water system without approval by the.

- 1604.4 Connections to Potable.** On-site treated nonpotable water systems shall have no connection to a potable water supply.
- 1604.5 Initial Cross-Connection Test.** A cross-connection test is required in accordance with Section 1604.12.2. Before the building is occupied or the system is activated, the plumbing contractor shall perform the initial cross-connection test in the presence of the proper administrative authority. The test shall be ruled successful before final approval is granted.
- 1604.6 On-Site Treated Nonpotable Water System Materials.** On-site treated nonpotable water supply and distribution system materials shall comply with the requirements of this code for potable water supply and distribution systems, unless otherwise provided for in this section.
- 1604.7 On-Site Treated Nonpotable Water Devices and Systems.** Devices or equipment used to treat on-site treated nonpotable water ~~in order to maintain the minimum water quality requirements determined in 1601.7~~ shall be listed, and labeled by a third-party certifying listing agency and approved for the intended application. Devices or equipment used to treat on-site treated non-potable water for use in water closet, urinal flushing, and similar applications shall be listed and labeled to IAPMO IGC207-2009a, NSF 350-2011.
- 1604.8 On-Site Treated Nonpotable Water System Color and Marking Information.** On-site treated water systems shall have a colored background and marking information in accordance with Section 601.2 of this code.
- 1604.9 Valves.** Valves, except fixture supply control valves, shall be equipped with a locking feature.
- 1604.10 Design and Installation.** The design and installation of on-site treated nonpotable systems shall be in accordance with Section 1604.10.1 through Section 1604.10.5.
- 1604.10.1 Listing Terms and Installation Instructions.** On-site treated nonpotable water systems shall be installed in accordance with the terms of its listing and the manufacturer's installation instructions.
- 1604.10.3 Deactivation and Drainage.** The on-site treated nonpotable water system and the potable water system within the building shall be provided with the required valves, air and vacuum relief valves, or other appurtenances to allow for deactivation or drainage as required for a cross-connection test in accordance with Section 1601.11.2.2.
- 1604.10.4 Near Underground Potable Water Pipe.** On-site treated nonpotable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12 inch minimum vertical and horizontal separation where both pipe materials are approved for use within a building. Where piping materials do not meet this requirement the minimum separation shall be increased to 60 inches. The potable water piping shall be installed at an elevation above the on-site treated nonpotable water piping.
- 1604.11 Signs.** Signs in buildings using on-site treated nonpotable water shall comply with Section 1601.10.
- 1604.12 Inspection and Testing.** On-site treated nonpotable water systems shall be inspected and tested in accordance with Section 1601.11.

**Water Reuse Group – this Exhibit 41, DRAFT 11/12/2013, was distributed at the 12/10/13 meeting and replaced Exhibit 41 found in the Recommended Code Language 2013 binder.**

## **CHAPTER 17**

### **NONPOTABLE RAINWATER CATCHMENT SYSTEMS**

#### **1701.0 General.**

**1701.1 Applicability.** The provisions of this chapter shall apply to the installation, construction, alteration, and repair of rainwater catchment systems for nonpotable applications listed in 1702.1.

**1701.1.1 Allowable Use of Rainwater.** Rainwater shall be permitted to be used in lieu of potable water for the applications identified in this chapter.

**1701.4 Component Identification.** System components shall be properly identified as to the manufacturer.

**1701.5 Maintenance and Inspection.** Rainwater systems and components shall be inspected and maintained in accordance with Section 1701.5.1 through Section 1701.5.3.

**1701.5.1 Frequency.** Rainwater systems and components shall be inspected and maintained in accordance with the manufacturer's recommendations.

**1701.5.2 Maintenance Log.** A maintenance log for rainwater systems is required. The property owner or designated appointee shall ensure that a record of testing, inspection, and maintenance is maintained in the log. The log will indicate the frequency of inspection and maintenance for each system.

**1701.5.3 Maintenance Responsibility.** The required maintenance and inspection of rainwater systems shall be the responsibility of the property owner.

**1701.6 Operation and Maintenance Manual.** An operation and maintenance manual for rainwater systems shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following:

- (1) Detailed diagram of the entire system and the location of system components.
- (2) Instructions on operating and maintaining the system.
- (3) Details on maintaining the ~~required~~ water quality.
- (4) Details on deactivating the system for maintenance, repair, or other purposes.
- (5) Applicable testing, inspection, and maintenance frequencies.
- (6) A method of contacting the manufacturer(s).

**1701.8 Material Compatibility.** Rainwater systems shall be constructed of materials that are compatible with the type of pipe and fitting materials, water treatment, and water conditions in the system. Components, piping, and fittings used in rainwater systems shall be listed per Chapter 14 and installed in accordance with the requirements of this plumbing code.

**1701.9 System Controls.** Controls for pumps, valves, and other devices that contain mercury that come in contact with rainwater supply shall not be permitted.

**1701.10 Separation Requirements.** All underground rainwater service piping shall be separated from the building sewer in accordance with Section 609.2. Treated non-potable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12 inch minimum vertical and horizontal separation when both pipe materials are approved for use within a building. Where horizontal piping materials do not meet this requirement the minimum separation shall be increased to 60 inches. The potable water piping shall be installed at an elevation above the non-potable water piping.

**1701.11 Abandonment.** All rainwater systems that are no longer in use or fails to be maintained in accordance with Section 1701.5 shall be abandoned. Abandonment shall comply with Section 1701.11.1 and Section 1701.11.2.

**1701.11.1 General.** Every abandoned system or part thereof covered under the scope of this chapter shall be disconnected from any remaining systems, drained, plugged, and capped per the requirements of this plumbing code.

**1701.11.2 Underground Tank.** Every underground water storage tank that has been abandoned or otherwise discontinued from use in a system covered under the scope of this chapter shall be completely drained and filled with earth, sand, gravel, concrete, or removed in a manner satisfactory to the Administrative Authority.

**1701.12 Sizing.** Unless otherwise provided for in this Chapter, rainwater piping shall be sized in accordance with Chapter 6 for sizing potable water piping.

#### **1702.0 Nonpotable Rainwater Catchment Systems.**

**1702.1 General.** The installation, construction, alteration, and repair of rainwater catchments systems intended to supply uses such as water closets, urinals, trap primers for floor drains, industrial processes, water features, cooling tower makeup, and similar uses shall be approved by the commissioner.

**1702.1.1 Irrigation.** Catchment systems used for irrigation in combination with any uses listed in 1702.1 shall meet the requirements of this Chapter.

**1702.2 Plumbing Plan Submission.** No permit for a rainwater catchment system shall be issued until complete plumbing plans have been submitted in duplicate and approved by the commissioner. No changes or connections shall be made to either the rainwater catchment or the potable water system within a site containing a rainwater catchment water system without approval by the commissioner.

**1702.3 System Changes.** No changes or connections shall be made to either the rainwater catchment system or the potable water system within a site containing a rainwater catchment system requiring a permit without approval by the commissioner.

**1702.4 Connections to Potable Water Systems.** Rainwater catchment systems shall have no direct connection to a potable water supply. Potable water is permitted to be used as makeup water for a rainwater catchment system provided the potable water supply connection is protected by an air gap or reduced-pressure principle backflow preventer in accordance with this code. An automatic means shall be installed to supply the rainwater catchment system with makeup water when there is insufficient rainwater to meet the required demand.

**1702.5 Initial Cross-Connection Test.** Where a portion of a rainwater catchment system is installed within a building, a cross-connection test is required in accordance with Section 1702.11.2. Before the building is occupied or the system is activated, the plumbing contractor shall perform the initial cross-connection test in the presence of the Administrative Authority. The test shall be ruled successful before final approval is granted.

**1702.6 Sizing.** The design and size of rainwater drains, conductors, and leaders shall comply with Chapter 11 of this code.

**1702.7 Rainwater Catchment System Materials.** Rainwater catchment system materials shall comply with Section 1702.7.1 through Section 1702.7.3.

**1702.7.1 Water Supply and Distribution Materials.** Rainwater catchment water supply and distribution materials shall comply with Chapter 6 and the requirements for potable water supply and distribution systems of this code, unless otherwise provided for in this section.

**1702.7.2 Rainwater Catchment System Drainage Materials.** Materials used in rainwater catchment drainage systems shall be in accordance with Chapter 11 and the requirements for storm drainage in this code.

**1702.7.3 Storage Tanks.** Rainwater storage tanks shall comply with Section 1702.9.5.

**1702.8 Rainwater Catchment System Color and Marking Information.** Rainwater catchment systems shall have a colored background in accordance with Section 601.2. Rainwater catchment systems shall be marked, in lettering in accordance with Section 601.2, with the words: "CAUTION: NONPOTABLE RAINWATER WATER, DO NOT DRINK."

**1702.9 Design and Installation.**

**1702.9.1 Outside Hose Bibbs.** Outside hose bibbs shall be allowed on rainwater piping systems. Hose bibbs supplying rainwater shall be marked with the words: "CAUTION: NONPOTABLE WATER, DO NOT DRINK" and Figure 1702.9.



**FIGURE 1702.9**

**1702.9.2 Deactivation and Drainage for Cross-Connection Test.** The rainwater catchment system and the potable water system within the building shall be provided with the required valves, air and vacuum relief valves, or other appurtenances to allow for deactivation or drainage as required for a cross-connection test in accordance with Section 1702.11.2.

**1702.9.3 Collection Surfaces.**

**1702.9.3.1 Rainwater Catchment System Surfaces.** Rainwater shall be collected from roof surfaces or other manmade, aboveground collection surfaces.

**1702.9.3.2 Other Surfaces.** Natural precipitation collected from surface water runoff, vehicular parking surfaces or manmade surfaces at or below grade shall be prohibited.

**1702.9.3.3 Prohibited Discharges.** Discharge from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater.

**1702.9.5 Rainwater Storage Tanks.** Rainwater storage tanks shall be constructed and installed in accordance with Section 1702.9.5.1 through Section 1702.9.5.8.

**1702.9.5.1 Construction.** Rainwater storage tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight.

**1702.9.5.2 Location.** Rainwater storage tanks shall be permitted to be installed above or below grade.

**1702.9.5.3 Above Grade.** Above grade storage tanks shall be of an opaque material, approved for aboveground use in direct sunlight or shall be shielded from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate loads in accordance with the building code.

**1702.9.5.4 Below Grade.** Rainwater storage tanks installed below grade shall be structurally designed to withstand anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft<sup>2</sup>) where the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. The manhole opening shall be a minimum diameter of 20 inches above and located not less than 4 inches above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down system shall meet or exceed the buoyancy force of the tank.

**1702.9.5.5 Drainage and Overflow.** Rainwater storage tanks shall be provided with a means of draining and cleaning. The overflow drain shall not be equipped with a shutoff valve. The overflow outlet shall discharge in accordance with this code for storm drainage systems. Where discharging to the storm drainage system, the overflow drain shall be protected from backflow of the storm drainage system by a backwater valve or other approved methods.

**1702.9.5.5(A) Overflow Outlet Size.** The overflow outlet shall be sized to accommodate the flow of the rainwater entering the tank and not less than the aggregate cross-sectional area of inflow pipes.

**1702.9.5.6 Opening and Access Protection.**

**1702.9.5.6(A) Animals and Insects.** Rainwater tank openings shall be protected to prevent the entrance of insects, birds, or rodents into the tank.

**1702.9.5.6(B) Human Access.** Rainwater tank access openings exceeding 12 inches in diameter shall be secured to prevent tampering and unintended entry by either a lockable device or other approved method.

**1702.9.5.7 Marking.** Rainwater tanks shall be permanently marked with the capacity and the language: "NONPOTABLE RAINWATER." Where openings are provided to allow a person to enter the tank, the opening shall be marked with the following language: "DANGER-CONFINED SPACE."

**1702.9.5.8 Storage Tank Venting.** A vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate a minimum of 12 inches above grade and shall be a minimum of 1-½ inches in diameter. The vent terminal shall be directed downward and covered with a 3/32 inch mesh screen to prevent the entry of vermin and insects.

**1702.9.6 Pumps.** Pumps serving rainwater catchment systems shall be listed per Chapter 14 of this plumbing code. Pumps supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 pounds-force per square inch (psi) residual pressure at the highest and most remote outlet served. Where the water pressure in the rainwater supply system within the building exceeds 80 psi, a listed pressure reducing valve reducing the pressure to 80 psi or less to water outlets in the building shall be installed in accordance with this code.

**1702.9.7 Roof Drains.** Primary and secondary roof drains, conductors, and leaders, shall be designed and installed in accordance with Chapter 11 of this code. Secondary roof drains shall be alarmed.

**1702.9.8 Water Quality Devices and Equipment.** Devices and equipment used to treat rainwater shall be listed, and labeled by a third-party certifying listing agency and approved for the intended application.

**1702.9.9 Freeze Protection.** Tanks and piping installed in locations subject to freezing shall be provided with an approved means of freeze protection.

**1702.10 Signs.** Signs in buildings using rainwater shall be in accordance with Section 1702.10.1 and Section 1702.10.2.

**1702.10.1 Commercial, Industrial, and Institutional Restroom Signs.** A sign shall be installed in restrooms in commercial, industrial, and institutional occupancies using nonpotable rainwater for water closets, urinals, or similar uses. Each sign shall contain ½ inch letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to users. The number and location of the signs shall be approved by the Administrative Authority and shall contain one the following texts determined by the following applications:

**1702.10.1(A)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS AND URINALS.

**1702.10.1(B)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS.

**1702.10.1(C)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH URINALS.

**1702.10.1(D)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO \* \_\_\_\_\_ \*

\* \_\_\_\_\_ \* Shall indicate the Rainwater usage.

**1702.10.2 Equipment Room Signs.** Each equipment room containing nonpotable rainwater equipment shall have a sign posted with the following wording in 1 inch letters:

CAUTION NONPOTABLE RAINWATER, DO NOT DRINK. DO NOT CONNECT TO DRINKING WATER SYSTEM. NOTICE: CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM.

This sign shall be posted in a location that is visible to anyone working on or near rainwater water equipment.

**1702.11 Inspection and Testing.** Rainwater catchment systems shall be inspected and tested in accordance with Section 1702.11.1 and Section 1702.11.2. Storage tanks shall be filled with water to the overflow opening for a period of 24 hours and during inspection or by other means as approved by the Administrative Authority. All seams and joints shall be exposed during inspection and checked for water tightness.

**1702.11.1 Supply System Inspection and Test.** Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of this code for testing of potable water and storm drainage systems.

**1702.11.2 Cross-Connection Inspection and Testing.** An initial inspection and test shall be performed on both the potable and rainwater catchment water systems. The potable and rainwater catchment water systems shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section 1702.11.2.1 through Section 1702.11.2.3.

**1702.11.2.1 Visual System Inspection.** Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by a plumber licensed under Minnesota Statutes, section 326B.46 and currently certified to ASSE Standard 5120 as follows:

(1) Pumps, equipment, equipment room signs, and exposed piping in an equipment room shall be checked.

**1702.11.2.2 Cross-Connection Test.** The procedure for determining cross-connection shall be followed by the plumbing contractor to determine whether a cross-connection has occurred as follows:

(1) The potable water system shall be activated and pressurized. The rainwater catchment water system shall be shut down and completely drained.

(2) The potable water system shall remain pressurized for a minimum period of time specified by the Administrative Authority while the rainwater catchment water system is empty. The minimum period the rainwater catchment water system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and rainwater catchment water distribution systems, but in no case shall that period be less than 1 hour.

(3) Fixtures, potable water, and rainwater systems shall be tested and inspected for flow. Flow from a rainwater catchment water system outlet shall indicate a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the rainwater water system.

(4) The drain on the rainwater catchment water system shall be checked for flow during the test and at the end of the period.

(5) The potable water system shall then be completely drained.

(6) The rainwater catchment water system shall then be activated and pressurized.

(7) The rainwater catchment water system shall remain pressurized for a minimum period of time specified by the Administrative Authority while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than 1 hour.

(8) Fixtures, potable water, and rainwater systems shall be tested and inspected for flow. Flow from a potable water system outlet shall indicate a cross-connection. No flow from a rainwater catchment water outlet shall indicate that it is connected to the potable water system.

(9) The drain on the potable water system shall be checked for flow during the test and at the end of the period.

(10) Where there is no flow detected in the fixtures which would indicate a cross-connection, the potable water system shall be re-pressurized.

**1702.11.2.3 Discovery of Cross-Connection.** In the event that a cross-connection is discovered, the following procedure shall be activated immediately:

(1) Rainwater catchment water piping to the building shall be shut down, and the rainwater water riser shall be drained.

(2) Potable water piping to the building shall be shut down at the meter.

(3) The cross-connection shall be uncovered and disconnected.

(4) The building shall be retested following procedures listed in Section 1702.11.2.1 and Section 1702.11.2.2.

(5) The potable water system shall be chlorinated with 50 ppm chlorine for 24 hours.

(6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. Where test results are acceptable, the potable water system shall be permitted to be recharged.

**1702.11.3 Annual Inspection and Test.** An annual inspection of the rainwater catchment water system, following the procedures listed in Section 1702.11.2.1 shall be required. Annual cross-connection testing, following the procedures listed in Section 1702.11.2.2 shall be required unless otherwise specified by the Administrative Authority, but in no event shall the test occur less than once in 5 years. Written records must be maintained and submitted to the Administrative Authority. Alternate testing requirements shall be permitted by the Administrative Authority.

Water Reuse Group – DRAFT 10/17/2013

## CHAPTER 17 NONPOTABLE RAINWATER CATCHMENT SYSTEMS

### 1701.0 General.

**1701.1 Applicability.** The provisions of this chapter shall apply to the installation, construction, alteration, and repair of rainwater catchment systems for nonpotable applications listed in 1702.1.

**1701.1.1 Allowable Use of Rainwater.** Rainwater shall be permitted to be used in lieu of potable water for the applications identified in this chapter.

If we are looking at including Chapter 16, do we want to leave 1701.4-1701.9 out of 17? And include: In addition, applicable provisions in Chapter 16, Sections 16.1.0 through 1601.9 for “Alternate Water Sources for Nonpotable Applications” shall apply to rainwater catchment systems. (Otherwise see modifications to 16 for this section),

**1701.4 Component Identification.** System components shall be properly identified as to the manufacturer.

**1701.5 Maintenance and Inspection.** Rainwater systems and components shall be inspected and maintained in accordance with Section 1701.5.1 through Section 1701.5.3.

**1701.5.1 Frequency.** Rainwater systems and components shall be inspected and maintained in accordance with the manufacturer’s recommendations.

**1701.5.2 Maintenance Log.** A maintenance log for rainwater systems is required. The property owner or designated appointee shall ensure that a record of testing, inspection, and maintenance is maintained in the log. The log will indicate the frequency of inspection and maintenance for each system.

**1701.5.3 Maintenance Responsibility.** The required maintenance and inspection of rainwater systems shall be the responsibility of the property owner.

**1701.6 Operation and Maintenance Manual.** An operation and maintenance manual for rainwater systems shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following:

- (1) Detailed diagram of the entire system and the location of system components.
- (2) Instructions on operating and maintaining the system.
- (3) Details on maintaining the required water quality.
- (4) Details on deactivating the system for maintenance, repair, or other purposes.
- (5) Applicable testing, inspection, and maintenance frequencies.
- (6) A method of contacting the manufacturer(s).

**1701.8 Material Compatibility.** Rainwater systems shall be constructed of materials that are compatible with the type of pipe and fitting materials, water treatment, and water conditions in the system. Components, piping, and fittings used in rainwater systems shall be listed per Chapter 14 and installed in accordance with the requirements of this plumbing code.

**1701.9 System Controls.** Controls for pumps, valves, and other devices that contain mercury that come in contact with rainwater supply shall not be permitted.

**1701.10 Separation Requirements.** All underground rainwater service piping shall be separated from the building sewer in accordance with Section 609.2. Treated non-potable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12 inch minimum vertical and horizontal separation when both pipe materials are approved for use within a building. Where horizontal piping materials do not meet this requirement the minimum separation shall be increased to 60 inches. The potable water piping shall be installed at an elevation above the non-potable water piping.

**1701.11 Abandonment.** All rainwater systems that are no longer in use or fails to be maintained in accordance with Section 1701.5 shall be abandoned. Abandonment shall comply with Section 1701.11.1 and Section 1701.11.2.

**1701.11.1 General.** Every abandoned system or part thereof covered under the scope of this chapter shall be disconnected from any remaining systems, drained, plugged, and capped per the requirements of this plumbing code.

**1701.11.2 Underground Tank.** Every underground water storage tank that has been abandoned or otherwise discontinued from use in a system covered under the scope of this chapter shall be completely drained and filled with earth, sand, gravel, concrete, or removed in a manner satisfactory to the Administrative Authority.

**1701.12 Sizing.** Unless otherwise provided for in this Chapter, rainwater piping shall be sized in accordance with Chapter 6 for sizing potable water piping.

### 1702.0 Nonpotable Rainwater Catchment Systems.

**1702.1 General.** The installation, construction, alteration, and repair of rainwater catchments systems intended to supply uses such as water closets, urinals, trap primers for floor drains, industrial processes, water features, cooling tower makeup, and similar uses shall be approved by the commissioner.

**1702.1.1 Irrigation.** Catchment systems used for irrigation in combination with any uses listed in 1702.1 shall meet the requirements of this Chapter.

**1702.2 Plumbing Plan Submission.** No permit for a rainwater catchment system shall be issued until complete plumbing plans have been submitted in duplicate and approved by the commissioner. No changes or connections shall be made to either the rainwater catchment or the potable water system within a site containing a rainwater catchment water system without approval by the commissioner.

**1702.3 System Changes.** No changes or connections shall be made to either the rainwater catchment system or the potable water system within a site containing a rainwater catchment system requiring a permit without approval by the commissioner.

**1702.4 Connections to Potable Water Systems.** Rainwater catchment systems shall have no direct connection to a potable water supply. Potable water is permitted to be used as makeup water for a rainwater catchment system provided the potable water supply connection is protected by an air gap or reduced-pressure principle backflow preventer in accordance with this code. An automatic means shall be installed to supply the rainwater catchment system with makeup water when there is insufficient rainwater to meet the required demand.

**1702.5 Initial Cross-Connection Test.** Where a portion of a rainwater catchment system is installed within a building, a cross-connection test is required in accordance with Section 1702.11.2. Before the building is occupied or the system is activated, the plumbing contractor shall perform the initial cross-connection test in the presence of the Administrative Authority. The test shall be ruled successful before final approval is granted.

**1702.6 Sizing.** The design and size of rainwater drains, conductors, and leaders shall comply with Chapter 11 of this code.

**1702.7 Rainwater Catchment System Materials.** Rainwater catchment system materials shall comply with Section 1702.7.1 through Section 1702.7.3.

**1702.7.1 Water Supply and Distribution Materials.** Rainwater catchment water supply and distribution materials shall comply with Chapter 6 and the requirements for potable water supply and distribution systems of this code, unless otherwise provided for in this section.

**1702.7.2 Rainwater Catchment System Drainage Materials.** Materials used in rainwater catchment drainage systems shall be in accordance with Chapter 11 and the requirements for storm drainage in this code.

**1702.7.3 Storage Tanks.** Rainwater storage tanks shall comply with Section 1702.9.5.

**1702.8 Rainwater Catchment System Color and Marking Information.** Rainwater catchment systems shall have a colored background in accordance with Section 601.2. Rainwater catchment systems shall be marked, in lettering in accordance with Section 601.2, with the words: "CAUTION: NONPOTABLE RAINWATER WATER, DO NOT DRINK."

**1702.9 Design and Installation.**

**1702.9.1 Outside Hose Bibbs.** Outside hose bibbs shall be allowed on rainwater piping systems. Hose bibbs supplying rainwater shall be marked with the words: "CAUTION: NONPOTABLE WATER, DO NOT DRINK" and Figure 1702.9.



**FIGURE 1702.9**

**1702.9.2 Deactivation and Drainage for Cross-Connection Test.** The rainwater catchment system and the potable water system within the building shall be provided with the required valves, air and vacuum relief valves, or other appurtenances to allow for deactivation or drainage as required for a cross-connection test in accordance with Section 1702.11.2.

**1702.9.3 Collection Surfaces.**

**1702.9.3.1 Rainwater Catchment System Surfaces.** Rainwater shall be collected from roof surfaces or other manmade, aboveground collection surfaces.

**1702.9.3.2 Other Surfaces.** Natural precipitation collected from surface water runoff, vehicular parking surfaces or manmade surfaces at or below grade shall be covered elsewhere (Chapter 16).

**1702.9.3.3 Prohibited Discharges.** Discharge from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater.

**1702.9.5 Rainwater Storage Tanks.** Rainwater storage tanks shall be constructed and installed in accordance with Section 1702.9.5.1 through Section 1702.9.5.8.

**1702.9.5.1 Construction.** Rainwater storage tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight.

**1702.9.5.2 Location.** Rainwater storage tanks shall be permitted to be installed above or below grade.

**1702.9.5.3 Above Grade.** Above grade storage tanks shall be of an opaque material, approved for aboveground use in direct sunlight or shall be shielded from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate loads in accordance with the building code.

**1702.9.5.4 Below Grade.** Rainwater storage tanks installed below grade shall be structurally designed to withstand anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft<sup>2</sup>) where the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. The manhole opening shall be a minimum diameter of 20 inches above and located not less than 4 inches above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down system shall meet or exceed the buoyancy force of the tank.

**1702.9.5.5 Drainage and Overflow.** Rainwater storage tanks shall be provided with a means of draining and cleaning. The overflow drain shall not be equipped with a shutoff valve. The overflow outlet shall discharge in accordance with this code for storm drainage systems. Where discharging to the storm drainage system, the overflow drain shall be protected from backflow of the storm drainage system by a backwater valve or other approved methods.

**1702.9.5.5(A) Overflow Outlet Size.** The overflow outlet shall be sized to accommodate the flow of the rainwater entering the tank and not less than the aggregate cross-sectional area of inflow pipes.

**1702.9.5.6 Opening and Access Protection.**

**1702.9.5.6(A) Animals and Insects.** Rainwater tank openings shall be protected to prevent the entrance of insects, birds, or rodents into the tank and piping systems. Screen installed on vent pipes, inlets, and overflow pipes shall have an aperture of not greater than 1/16 of an inch (1.6 mm) and shall be close fitting.

**1702.9.5.6(B) Human Access.** Rainwater tank access openings exceeding 12 inches in diameter shall be secured to prevent tampering and unintended entry by either a lockable device or other approved method.

**1702.9.5.7 Marking.** Rainwater tanks shall be permanently marked with the capacity and the language: "NONPOTABLE RAINWATER." Where openings are provided to allow a person to enter the tank, the opening shall be marked with the following language: "DANGER-CONFINED SPACE."

**1702.9.5.8 Storage Tank Venting.** A vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate a minimum of 12 inches above grade and shall be a minimum of 1-½ inches in diameter. The vent terminal shall be directed downward and covered with a 3/32 inch mesh screen to prevent the entry of vermin and insects.

**1702.9.6 Pumps.** Pumps serving rainwater catchment systems shall be listed per Chapter 14 of this plumbing code. Pumps supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 pounds-force per square inch (psi) residual pressure at the highest and most remote outlet served. Where the water pressure in the rainwater supply system within the building exceeds 80 psi, a listed pressure reducing valve reducing the pressure to 80 psi or less to water outlets in the building shall be installed in accordance with this code.

**1702.9.7 Roof Drains.** Primary and secondary roof drains, conductors, and leaders, shall be designed and installed in accordance with Chapter 11 of this code. Secondary roof drains shall be alarmed.

**1702.9.8 Water Quality Devices and Equipment.** Devices and equipment used to treat rainwater shall be listed, and labeled by a third-party certifying listing agency and approved for the intended application.

**1702.9.9 Freeze Protection.** Tanks and piping installed in locations subject to freezing shall be provided with an approved means of freeze protection.

**1702.10 Signs.** Signs in buildings using rainwater shall be in accordance with Section 1702.10.1 and Section 1702.10.2.

**1702.10.1 Commercial, Industrial, and Institutional Restroom Signs.** A sign shall be installed in restrooms in commercial, industrial, and institutional occupancies using nonpotable rainwater for water closets, urinals, or similar uses. Each sign shall contain ½ inch letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to users. The number and location of the signs shall be approved by the Administrative Authority and shall contain one the following texts determined by the following applications:

**1702.10.1(A)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS AND URINALS.

**1702.10.1(B)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS.

**1702.10.1(C)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH URINALS.

**1702.10.1(D)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO \* \_\_\_\_\_ \*

\* \_\_\_\_\_ \* Shall indicate the Rainwater usage.

**1702.10.2 Equipment Room Signs.** Each equipment room containing nonpotable rainwater equipment shall have a sign posted with the following wording in 1 inch letters:

CAUTION NONPOTABLE RAINWATER, DO NOT DRINK. DO NOT CONNECT TO DRINKING WATER SYSTEM. NOTICE: CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM.

This sign shall be posted in a location that is visible to anyone working on or near rainwater water equipment.

**1702.11 Inspection and Testing.** Rainwater catchment systems shall be inspected and tested in accordance with Section 1702.11.1 and Section 1702.11.2. Storage tanks shall be filled with water to the overflow opening for a period of 24 hours and during inspection or by other means as approved by the Administrative Authority. All seams and joints shall be exposed during inspection and checked for water tightness.

**1702.11.1 Supply System Inspection and Test.** Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of this code for testing of potable water and storm drainage systems.

**1702.11.2 Cross-Connection Inspection and Testing.** An initial inspection and test shall be performed on both the potable and rainwater catchment water systems. The potable and rainwater catchment water systems shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section 1702.11.2.1 through Section 1702.11.2. 3.

**1702.11.2.1 Visual System Inspection.** Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by a plumber licensed under Minnesota Statutes, section 326B.46 and currently certified to ASSE Standard 5120 as follows:

(1) Pumps, equipment, equipment room signs, and exposed piping in an equipment room shall be checked.

**1702.11.2.2 Cross-Connection Test.** The procedure for determining cross-connection shall be followed by the plumbing contractor to determine whether a cross-connection has occurred as follows:

(1) The potable water system shall be activated and pressurized. The rainwater catchment water system shall be shut down and completely drained.

(2) The potable water system shall remain pressurized for a minimum period of time specified by the Administrative Authority while the rainwater catchment water system is empty. The minimum period the rainwater catchment water system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and rainwater catchment water distribution systems, but in no case shall that period be less than 1 hour.

(3) Fixtures, potable water, and rainwater systems shall be tested and inspected for flow. Flow from a rainwater catchment water system outlet shall indicate a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the rainwater water system.

(4) The drain on the rainwater catchment water system shall be checked for flow during the test and at the end of the period.

(5) The potable water system shall then be completely drained.

(6) The rainwater catchment water system shall then be activated and pressurized.

(7) The rainwater catchment water system shall remain pressurized for a minimum period of time specified by the Administrative Authority while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than 1 hour.

(8) Fixtures, potable water, and rainwater systems shall be tested and inspected for flow. Flow from a potable water system outlet shall indicate a cross-connection. No flow from a rainwater catchment water outlet shall indicate that it is connected to the potable water system.

(9) The drain on the potable water system shall be checked for flow during the test and at the end of the period.

(10) Where there is no flow detected in the fixtures which would indicate a cross-connection, the potable water system shall be re-pressurized.

**1702.11.2.3 Discovery of Cross-Connection.** In the event that a cross-connection is discovered, the following procedure shall be activated immediately:

(1) Rainwater catchment water piping to the building shall be shut down, and the rainwater water riser shall be drained.

(2) Potable water piping to the building shall be shut down at the meter.

(3) The cross-connection shall be uncovered and disconnected.

(4) The building shall be retested following procedures listed in Section 1702.11.2.1 and Section 1702.11.2.2.

(5) The potable water system shall be chlorinated with 50 ppm chlorine for 24 hours.

(6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. Where test results are acceptable, the potable water system shall be permitted to be recharged.

**1702.11. 3 Annual Inspection and Test.** An annual inspection of the rainwater catchment water system, following the procedures listed in Section 1702.11.2.1 shall be required. Annual cross-connection testing, following the procedures listed in Section 1702.11.2.2 shall be required unless otherwise specified by the Administrative Authority, but in no event shall the test occur less than once in 5 years. Written records must be maintained and submitted to the Administrative Authority. Alternate testing requirements shall be permitted by the Administrative Authority.

**DLI – this Exhibit 41, DRAFT 10/17/2013, was distributed at the 12/10/13 meeting and replaced Exhibit 41 found in the Recommended Code Language 2013 binder.**

## **CHAPTER 17**

### **NONPOTABLE RAINWATER CATCHMENT SYSTEMS**

#### **1701.0 General.**

**1701.1 Applicability.** The provisions of this chapter shall apply to the installation, construction, alteration, and repair of rainwater catchment systems for nonpotable applications listed in 1702.1.

**1701.1.1 Allowable Use of Rainwater.** Rainwater shall be permitted to be used in lieu of potable water for the applications identified in this chapter.

**1701.4 Component Identification.** System components shall be properly identified as to the manufacturer.

**1701.5 Maintenance and Inspection.** Rainwater systems and components shall be inspected and maintained in accordance with Section 1701.5.1 through Section 1701.5.3.

**1701.5.1 Frequency.** Rainwater systems and components shall be inspected and maintained in accordance with the manufacturer's recommendations.

**1701.5.2 Maintenance Log.** A maintenance log for rainwater systems is required. The property owner or designated appointee shall ensure that a record of testing, inspection, and maintenance is maintained in the log. The log will indicate the frequency of inspection and maintenance for each system.

**1701.5.3 Maintenance Responsibility.** The required maintenance and inspection of rainwater systems shall be the responsibility of the property owner.

**1701.6 Operation and Maintenance Manual.** An operation and maintenance manual for rainwater systems shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following:

- (1) Detailed diagram of the entire system and the location of system components.
- (2) Instructions on operating and maintaining the system.
- (3) Details on maintaining ~~the required~~ water quality.
- (4) Details on deactivating the system for maintenance, repair, or other purposes.
- (5) Applicable testing, inspection, and maintenance frequencies.
- (6) A method of contacting the manufacturer(s).

**1701.8 Material Compatibility.** Rainwater systems shall be constructed of materials that are compatible with the type of pipe and fitting materials, water treatment, and water conditions in the system. Components, piping, and fittings used in rainwater systems shall be listed per Chapter 14 and installed in accordance with the requirements of this plumbing code.

**1701.9 System Controls.** Controls for pumps, valves, and other devices that contain mercury that come in contact with rainwater supply shall not be permitted.

**1701.10 Separation Requirements.** All underground rainwater service piping shall be separated from the building sewer in accordance with Section 609.2. Treated non-potable water pipes shall be permitted to be run or laid in the same trench as potable water pipes with a 12 inch minimum vertical and horizontal separation when both pipe materials are approved for use within a building. Where horizontal piping materials do not meet this requirement the minimum separation shall be increased to 60 inches. The potable water piping shall be installed at an elevation above the non-potable water piping.

**1701.11 Abandonment.** All rainwater systems that are no longer in use or fails to be maintained in accordance with Section 1701.5 shall be abandoned. Abandonment shall comply with Section 1701.11.1 and Section 1701.11.2.

**1701.11.1 General.** Every abandoned system or part thereof covered under the scope of this chapter shall be disconnected from any remaining systems, drained, plugged, and capped per the requirements of this plumbing code.

**1701.11.2 Underground Tank.** Every underground water storage tank that has been abandoned or otherwise discontinued from use in a system covered under the scope of this chapter shall be completely drained and filled with earth, sand, gravel, concrete, or removed in a manner satisfactory to the Administrative Authority.

**1701.12 Sizing.** Unless otherwise provided for in this Chapter, rainwater piping shall be sized in accordance with Chapter 6 for sizing potable water piping.

#### **1702.0 Nonpotable Rainwater Catchment Systems.**

**1702.1 General.** The installation, construction, alteration, and repair of rainwater catchments systems intended to supply uses such as water closets, urinals, trap primers for floor drains, industrial processes, water features, cooling tower makeup, and similar uses shall be approved by the commissioner.

**1702.1.1 Irrigation.** Catchment systems used for irrigation in combination with any uses listed in 1702.1 shall meet the requirements of this Chapter.

**1702.2 Plumbing Plan Submission.** No permit for a rainwater catchment system shall be issued until complete plumbing plans have been submitted in duplicate and approved by the commissioner. No changes or connections shall be made to either the rainwater catchment or the potable water system within a site containing a rainwater catchment water system without approval by the commissioner.

**1702.3 System Changes.** No changes or connections shall be made to either the rainwater catchment system or the potable water system within a site containing a rainwater catchment system requiring a permit without approval by the commissioner.

**1702.4 Connections to Potable Water Systems.** Rainwater catchment systems shall have no direct connection to a potable water supply. Potable water is permitted to be used as makeup water for a rainwater catchment system provided the potable water supply connection is protected by an air gap or reduced-pressure principle backflow preventer in accordance with this code. An automatic means shall be installed to supply the rainwater catchment system with makeup water when there is insufficient rainwater to meet the required demand.

**1702.5 Initial Cross-Connection Test.** Where a portion of a rainwater catchment system is installed within a building, a cross-connection test is required in accordance with Section 1702.11.2. Before the building is occupied or the system is activated, the plumbing contractor shall perform the initial cross-connection test in the presence of the Administrative Authority. The test shall be ruled successful before final approval is granted.

**1702.6 Sizing.** The design and size of rainwater drains, conductors, and leaders shall comply with Chapter 11 of this code.

**1702.7 Rainwater Catchment System Materials.** Rainwater catchment system materials shall comply with Section 1702.7.1 through Section 1702.7.3.

**1702.7.1 Water Supply and Distribution Materials.** Rainwater catchment water supply and distribution materials shall comply with Chapter 6 and the requirements for potable water supply and distribution systems of this code, unless otherwise provided for in this section.

**1702.7.2 Rainwater Catchment System Drainage Materials.** Materials used in rainwater catchment drainage systems shall be in accordance with Chapter 11 and the requirements for storm drainage in this code.

**1702.7.3 Storage Tanks.** Rainwater storage tanks shall comply with Section 1702.9.5.

**1702.8 Rainwater Catchment System Color and Marking Information.** Rainwater catchment systems shall have a colored background in accordance with Section 601.2. Rainwater catchment systems shall be marked, in lettering in accordance with Section 601.2, with the words: "CAUTION: NONPOTABLE RAINWATER WATER, DO NOT DRINK."

**1702.9 Design and Installation.**

**1702.9.1 Outside Hose Bibbs.** Outside hose bibbs shall be allowed on rainwater piping systems. Hose bibbs supplying rainwater shall be marked with the words: "CAUTION: NONPOTABLE WATER, DO NOT DRINK" and Figure 1702.9.



**FIGURE 1702.9**

**1702.9.2 Deactivation and Drainage for Cross-Connection Test.** The rainwater catchment system and the potable water system within the building shall be provided with the required valves, air and vacuum relief valves, or other appurtenances to allow for deactivation or drainage as required for a cross-connection test in accordance with Section 1702.11.2.

**1702.9.3 Collection Surfaces.**

**1702.9.3.1 Rainwater Catchment System Surfaces.** Rainwater shall be collected from roof surfaces or other manmade, aboveground collection surfaces.

**1702.9.3.2 Other Surfaces.** Natural precipitation collected from surface water runoff, vehicular parking surfaces or manmade surfaces at or below grade shall be prohibited not connect to rainwater catchment systems governed by this chapter.

**1702.9.3.3 Prohibited Discharges.** Discharge from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater.

**1702.9.5 Rainwater Storage Tanks.** Rainwater storage tanks shall be constructed and installed in accordance with Section 1702.9.5.1 through Section 1702.9.5.8.

**1702.9.5.1 Construction.** Rainwater storage tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight.

**1702.9.5.2 Location.** Rainwater storage tanks shall be permitted to be installed above or below grade.

**1702.9.5.3 Above Grade.** Above grade storage tanks shall be of an opaque material, approved for aboveground use in direct sunlight or shall be shielded from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate loads in accordance with the building code.

**1702.9.5.4 Below Grade.** Rainwater storage tanks installed below grade shall be structurally designed to withstand anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft<sup>2</sup>) where the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. The manhole opening shall be a minimum diameter of 20 inches above and located not less than 4 inches above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down system shall meet or exceed the buoyancy force of the tank.

**1702.9.5.5 Drainage and Overflow.** Rainwater storage tanks shall be provided with a means of draining and cleaning. The overflow drain shall not be equipped with a shutoff valve. The overflow outlet shall discharge in accordance with this code for storm drainage systems. Where discharging to the storm drainage system, the overflow drain shall be protected from backflow of the storm drainage system by a backwater valve or other approved methods.

**1702.9.5.5(A) Overflow Outlet Size.** The overflow outlet shall be sized to accommodate the flow of the rainwater entering the tank and not less than the aggregate cross-sectional area of inflow pipes.

**1702.9.5.6 Opening and Access Protection.**

**1702.9.5.6(A) Animals and Insects.** Rainwater tank openings shall be protected to prevent the entrance of insects, birds, or rodents into the tank.

**1702.9.5.6(B) Human Access.** Rainwater tank access openings exceeding 12 inches in diameter shall be secured to prevent tampering and unintended entry by either a lockable device or other approved method.

**1702.9.5.7 Marking.** Rainwater tanks shall be permanently marked with the capacity and the language: "NONPOTABLE RAINWATER." Where openings are provided to allow a person to enter the tank, the opening shall be marked with the following language: "DANGER-CONFINED SPACE."

**1702.9.5.8 Storage Tank Venting.** A vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate a minimum of 12 inches above grade and shall be a minimum of 1-½ inches in diameter. The vent terminal shall be directed downward and covered with a 3/32 inch mesh screen to prevent the entry of vermin and insects.

**1702.9.6 Pumps.** Pumps serving rainwater catchment systems shall be listed per Chapter 14 of this plumbing code. Pumps supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 pounds-force per square inch (psi) residual pressure at the highest and most remote outlet served. Where the water pressure in the rainwater supply system within the building exceeds 80 psi, a listed pressure reducing valve reducing the pressure to 80 psi or less to water outlets in the building shall be installed in accordance with this code.

**1702.9.7 Roof Drains.** Primary and secondary roof drains, conductors, and leaders, shall be designed and installed in accordance with Chapter 11 of this code. Secondary roof drains shall be alarmed.

**1702.9.8 Water Quality Devices and Equipment Required.** ~~Devices and equipment used to treat rainwater shall be listed, and labeled by a third party certifying listing agency and approved for the intended application.~~ The rainwater harvesting system must be filtered and disinfected as necessary to maintain adequate water quality to provide safe levels to protect public health for the intended use. ~~Devices and equipment used to treat rainwater must be engineered and manufactured for rainwater harvesting application and shall be documented by the manufacturer and a Minnesota Registered Engineer to be properly designed and sized for the specific project.~~

**1702.9.9 Freeze Protection.** Tanks and piping installed in locations subject to freezing shall be provided with an approved means of freeze protection.

**1702.10 Signs.** Signs in buildings using rainwater shall be in accordance with Section 1702.10.1 and Section 1702.10.2.

**1702.10.1 Commercial, Industrial, and Institutional Restroom Signs.** A sign shall be installed in restrooms in commercial, industrial, and institutional occupancies using nonpotable rainwater for water closets, urinals, or similar uses. Each sign shall contain ½ inch letters of a highly visible color on a contrasting background. The location of the sign(s) shall be such that the sign(s) shall be visible to users. The number and location of the signs shall be approved by the Administrative Authority and shall contain one the following texts determined by the following applications:

**1702.10.1(A)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS AND URINALS.

**1702.10.1(B)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH TOILETS.

**1702.10.1(C)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO FLUSH URINALS.

**1702.10.1(D)** TO CONSERVE WATER, THIS BUILDING USES RAINWATER TO \* \_\_\_\_\_ \*

\* \_\_\_\_\_ \* Shall indicate the Rainwater usage.

**1702.10.2 Equipment Room Signs.** Each equipment room containing nonpotable rainwater equipment shall have a sign posted with the following wording in 1 inch letters:

CAUTION NONPOTABLE RAINWATER, DO NOT DRINK. DO NOT CONNECT TO DRINKING WATER SYSTEM. NOTICE: CONTACT BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK ON THIS WATER SYSTEM.

This sign shall be posted in a location that is visible to anyone working on or near rainwater water equipment.

**1702.11 Inspection and Testing.** Rainwater catchment systems shall be inspected and tested in accordance with Section 1702.11.1 and Section 1702.11.2. Storage tanks shall be filled with water to the overflow opening for a period of 24 hours and during inspection or by other means as approved by the Administrative Authority. All seams and joints shall be exposed during inspection and checked for water tightness.

**1702.11.1 Supply System Inspection and Test.** Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of this code for testing of potable water and storm drainage systems.

**1702.11.2 Cross-Connection Inspection and Testing.** An initial inspection and test shall be performed on both the potable and rainwater catchment water systems. The potable and rainwater catchment water systems shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section 1702.11.2.1 through Section 1702.11.2. 3.

**1702.11.2.1 Visual System Inspection.** Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by a plumber licensed under Minnesota Statutes, section 326B.46 and currently certified to ASSE Standard 5120 as follows:

(1) Pumps, equipment, equipment room signs, and exposed piping in an equipment room shall be checked.

**1702.11.2.2 Cross-Connection Test.** The procedure for determining cross-connection shall be followed by the plumbing contractor to determine whether a cross-connection has occurred as follows:

(1) The potable water system shall be activated and pressurized. The rainwater catchment water system shall be shut down and completely drained.

(2) The potable water system shall remain pressurized for a minimum period of time specified by the Administrative Authority while the rainwater catchment water system is empty. The minimum period the rainwater catchment water system is to remain depressurized shall be determined on a case-by-case basis, taking into account the size and complexity of the potable and rainwater catchment water distribution systems, but in no case shall that period be less than 1 hour.

(3) Fixtures, potable water, and rainwater systems shall be tested and inspected for flow. Flow from a rainwater catchment water system outlet shall indicate a cross-connection. No flow from a potable water outlet shall indicate that it is connected to the rainwater water system.

(4) The drain on the rainwater catchment water system shall be checked for flow during the test and at the end of the period.

(5) The potable water system shall then be completely drained.

(6) The rainwater catchment water system shall then be activated and pressurized.

(7) The rainwater catchment water system shall remain pressurized for a minimum period of time specified by the Administrative Authority while the potable water system is empty. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than 1 hour.

(8) Fixtures, potable water, and rainwater systems shall be tested and inspected for flow. Flow from a potable water system outlet shall indicate a cross-connection. No flow from a rainwater catchment water outlet shall indicate that it is connected to the potable water system.

(9) The drain on the potable water system shall be checked for flow during the test and at the end of the period.

(10) Where there is no flow detected in the fixtures which would indicate a cross-connection, the potable water system shall be re-pressurized.

**1702.11.2.3 Discovery of Cross-Connection.** In the event that a cross-connection is discovered, the following procedure shall be activated immediately:

(1) Rainwater catchment water piping to the building shall be shut down, and the rainwater water riser shall be drained.

(2) Potable water piping to the building shall be shut down at the meter.

(3) The cross-connection shall be uncovered and disconnected.

(4) The building shall be retested following procedures listed in Section 1702.11.2.1 and Section 1702.11.2.2.

(5) The potable water system shall be chlorinated with 50 ppm chlorine for 24 hours.

(6) The potable water system shall be flushed after 24 hours, and a standard bacteriological test shall be performed. Where test results are acceptable, the potable water system shall be permitted to be recharged.

**1702.11. 3 Annual Inspection and Test.** An annual inspection of the rainwater catchment water system, following the procedures listed in Section 1702.11.2.1 shall be required. Annual cross-connection testing, following the procedures listed in Section 1702.11.2.2 shall be required unless otherwise specified by the Administrative Authority, but in no event shall the test occur less than once in 5 years. Written records must be maintained and submitted to the Administrative Authority. Alternate testing requirements shall be permitted by the Administrative Authority.