

**Plumbing Board
Meeting Minutes
May 20, 2014 at 9:30 a.m.
Minnesota Room – Department of Labor and Industry
443 Lafayette Road North, St. Paul, MN 55155**

Members

John Parizek (Chair)
Mike McGowan
Scott Eggen
Ron Thompson
Larry Justin
Gale Mount
Chad Filek
Joe Beckel
Phillip Sterner
Jim Lungstrom
Ron Thompson
Pete Moulton

Members Absent

Grant Edwards
John Flagg
James Kittelson

DLI Visitors via teleconference

Jim Bauer (Green Turtle)
Ken Loucks (Schier Products)

DLI Staff & Visitors

Wendy Legge (Chief Gen. Counsel, DLI)
Suzanne Todnem (DLI)
Cathy Tran (DLI)
Jim Peterson (DLI)
Lyndy Lutz (DLI)
Gary Thaden (MMCA)
Richard Hauffe (ICC)
Brian Noma (MDH)
Tim Power (MNLA)
David Skallet (City of St. Louis Park)
Phil Raines (ABC)
Bob Taylor (New Age Casting)
Matt Marciniak (IAPMO)
Ray VinZant (Midway Vo-Tech)
Scott Thompson (MN Plumbing Training)
Harry Blonigen (BHH Property)
Jon Schroeder (Schroeder Sales)
Dwight Engen (LECET)
Joe Spartz (BOMA)
Laura Millberg (MPCA)
Manuel Manzano (ASPE)
Russell Beyer (LTC)

I. Call to Order

The meeting was called to order by Chair Parizek at 9:38 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 Mount, seconded by Moulton, to approve the agenda as presented. The vote was unanimous; the motion carried.

III. Approval of Previous Meeting Minutes

A. Plumbing Board Minutes – April 15, 2014

A motion was made by Mount, seconded by Beckel, to approve the Minutes with the following revision: Page 9 change motions to read 5 for / 6 opposed. The vote was unanimous; the motion carried.

IV. Regular Business

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

V. Special Business

A) Request for Interpretation (File # PB0079) Exterior Venting

Harry Blonigen, BHH Property Management, Inc.

Chair Parizek stated that it appeared the case had been resolved. Mr. Blonigen agreed that it had but asked that the resolution be reviewed as an acceptable solution for venting on future projects. In order to go through an attic in many older homes, zig-zagging through the house is required to get up through the roof. This solution was given a verbal pre-approval by John Roehl (Plumbing Inspector – West Central District). The building official put a stop order on the project which had nothing to do with venting the system. Blonigen had proposed to close the vent pipe with R20 insulation, 4 inches of Styrofoam, and a ½-inch of treated plywood (covered/primed/paint); this solution was rejected. He was forced to hire an engineer for \$550. The engineer proposed 8 inches of R8 and 2 inches of fiberglass insulation with either a vinyl or aluminum cladding to protect the insulation from getting wet; the building official approved it. In order to bring this vent up through an attic it would be very time consuming and you would tear into the house far more than is required. He referred to examples that refer back to the code and then requested that their proposed solution (as submitted in RFI #PB0079) be put into the code book as a viable solution.

The Board asked if the first option was to enclose the vent pipe through the exterior wall. Blonigen stated no, the proposal was to bring the pipe through and enclose it with R-20 insulation – the building official refused this but then approved the engineer’s proposal. Blonigen said there were no building code issues. The Board asked if the design or proposal was reviewed by the city official prior to installation; Blonigen said no, the plumber, Visa Plumbing and Heating, called John Roehl, explained the situation and asked if they could go out the side and through the roof; John said yes, this would be acceptable. The plumber did this and then the building official said it was not acceptable.

Members of the Board agreed that this solution should have been acceptable and there didn’t appear to be any plumbing code violation; therefore, there would not be a need for a plumbing code change. Board members stated it seemed to be more of a building code issue. Wendy Legge asked if Blonigen was asking for an interpretation of adequate protection. Blonigen stated his request was to have the solution that he implemented as an acceptable solution to venting in the Plumbing

Code versus going through the attic. The Board's interpretation is that it is already accepted and it shouldn't be an issue with the local inspector.

Legge asked if this should really be a Request for Final Interpretation because it would mean the Board was considering an amendment to the Plumbing Code and it didn't sound as though Mr. Blonigen was asking for this. Blonigen said he wanted something in writing stating there wasn't a violation so that he wouldn't need to hire another engineer if there were a problem. Legge stated that when the Board considers a Request for Interpretation, it is only when there is a disagreement between the person requesting the interpretation and the Department of Labor & Industry's interpretation from the plumbing unit. Chair Parizek said there was not a conflict with (DLI) but there was still a conflict with a local building inspector. Parizek noted the Board should take a look at the 3 code violations that the local inspector cited and determine whether or not this installation violated any of those.

A Motion was made by Mount (and amended as shown), seconded by Justin, that there were no plumbing code violations for the 3 code sections that are listed in Sid Fossan's March 7, 2014 letter (see below). The vote was unanimous; the motion carried.

- **4715.2330 Minimum Size of Stack Vent or Vent Stack**
- **4715.2520 Vent Stacks and Stack Vents**
- **4715.2530 Vent Terminals**

A Motion was made by Mount, seconded by Justin, that the Chair can sign an appropriate interpretation consistent with the above Motion that will reference the installation with the three references to violations and that the Board found no violations. The Final Interpretation will be published on the website with a completed RFI. The vote was unanimous; the motion carried.

B) Review of North Dakota license reciprocity agreement

Chair Parizek stated that the reciprocity between Minnesota and North Dakota was signed by the Commissioner of Health on December 7, 1989. This is supposed to be re-approved every two years. Since it was originally signed some of the items have changed regarding continuing education (CE) requirements in Minnesota. This doesn't address renewals at all, only the initial reciprocity to obtain a Minnesota license if you have a North Dakota license and vice versa. You wouldn't be required to take a state exam; you would just submit the proof that you have the other's license and submit the proper fees. There is now an issue with the renewal process – the CE requirements in North Dakota are less than what is required in Minnesota. Parizek noted that North Dakota's CE requires 3 hours every 2 years; Minnesota requires 16 hours. He said he wanted to appoint a committee to begin communications with North Dakota so that a new agreement could be reached. Currently, the agreement is under the Commissioner of Health; the Plumbing Board

hasn't been affiliated with the Department of Health for quite some time. There should be a new agreement drafted by DLI.

Gary Thaden addressed the Board stating the issue arose because Minnesota now has CE where it didn't before and there is now a lot of plumbing work in North Dakota. There are vastly more plumbers going from Minnesota to ND than North Dakota plumbers coming to MN. To help our residents, our plumbers, is one reason for (a new agreement). Previously ND had a CE requirement and MN did not. ND gave MN plumbers a pass on having any CE education. ND is much more informal in their processes than we are here in Minnesota. Thaden suggested working through these issues over the summer and coming to a resolution.

Parizek said the Board needs to look at (reciprocity) from a legal standpoint to see what can actually be done – a rule change may be needed. A new agreement with ND, and anyone else interested, needs to be reached, especially with our new CE requirements, so that CE is recognized in both states. Reciprocity agreements are legally in effect now although it has been more than two years since it was signed. A new draft needs to be drawn up and signed by DLI.

Scott Thompson addressed the Board. He currently travels Minnesota teaching education. Reciprocity between MN and ND is a huge issue because every licensed master plumber (2,500 people) in ND will lose their license at the end of the year and asked if the Board could grant a "bye". Parizek stated the Board does not have the authority to issue a 'bye'. Beckel asked if legality issues could be addressed soon and reciprocity should include WI and IA. The Board agreed that Minnesota's CE requirements should be reviewed pertaining to reciprocal agreements. Legge clarified that the Board has the authority to approve the license reciprocity agreements and to adopt rules relating to licensing. The Board can make a recommendation to DLI but the Board cannot grant anyone a "bye" or pass.

Todnem stated you need to look at the purpose of the reciprocity and ask if it is to give non-Minnesota plumbers quick entry into MN plumbing or is it a true reciprocity relationship. Once you can determine what it is then it can guide the discussions of the Committee.

Parizek stated he would like to appoint an ad-hoc Committee with himself, Jim Lungstrom (representing DLI), Phillip Sterner, Joe Beckel, and Scott Eggen, with Jim Peterson as a consultant, to start work on the reciprocity agreement with ND and bring a recommendation back to the Board at the next (regular) meeting.

**C) Request for Action (File #PB0067) Oil and Flammable Waste Interceptors.
Schier Products**

Parizek said that originally Schier Products proposed this to the Board to look at their product for approval and included in the Minnesota Plumbing Code. Since that time, the Board began looking at a possible adoption of UPC with amendments and Schier Products was told there shouldn't be an issue because there weren't any proposed changes to that section in the UPC; since then this has changed. This item was placed on the agenda to take a look at their request for action and to look at language proposed to move forward in possible amendments.

The meeting broke for a 20 minute recess.

Ken Loucks, Regulatory Compliance Manager of Schier Products and Jim Bauer, Green Turtle, were present via teleconference.

Ken Loucks introduced himself as the Regulatory Compliance Manager of Schier Products and reminded everyone that the issue dated back to 2012 when they petitioned the Plumbing Board for approval of alternate materials. Their argument is very simple, the one size fits all approach is a deterrent. The Minnesota Plumbing Code limits and restricts opportunities for businesses to have both properly sized interceptors that would be more accurate and less expensive. The current restriction on materials allows selection of more interior products (concrete and steel) over products such as high density polyethylene, which has been used for almost a decade in this same application and is allowed under other standards. For example, PS80 allows for high density polyethylene, is superior, and should be allowed. In addition, they can't seem to identify anything that would suggest that the current Minnesota Plumbing Code would be better than their design. Their design has been tested and tried.

Tran explained that the Plumbing Board is moving forward with amendments and the section for oil and flammable liquid interceptors was reviewed. The Board looked at how the provision of 1017 would be administered as it related to flammables and oil. The department recommended deletion of that provision when it referred to chapter 14, PS80, and ASTM D 6104 – there are no specifically approved materials. They recommended easier design and administration of interceptors for inspectors and building officials by having more precise materials and sizing to deal with emergency spills – this is where the one size fits all comes in. If the Board were to move forward with 1017, particularly PS80, there is nothing that says HDPE interceptors are acceptable under 1017; it would have to be considered as an alternate anyway. In addition, the fiberglass, concrete and steel tank would have to be considered as alternates. From an administrative standpoint that is why the Board recommended moving forward with Minnesota specific language on interceptors.

Ken Loucks stated that the Uniform Plumbing Code (UPC) is not intended to write standards themselves, it adopts standards that govern products and this is the purpose for chapter 14. Therefore, if a standard is not specifically listed in a

particular chapter, that standard is still referred to in earlier portions of the code as being required to be compliant and listed in chapter 14.

Tran referred to IAPMO PS80 standards and said there was nothing that indicates it is acceptable for flammable waste.

Loucks stated there is no distinction in the UPC between oil and flammable waste, they are all floatable materials. He added that Tran was talking about separators versus tanks and this needs to be kept in mind – there is a clear distinction in almost all codes in the way it is interpreted as to whether something is intended to store or separate. Separators should not be treated as tanks which would be in some cases, far more restrictive regarding the interceptors. In this particular case, a separator is a separator. If it floats, an interceptor should be designed to separate floatables and if it sinks then it should be designed to allow something to sink in it. That is simply how they work. The UPC does allow them to be the same interceptor.

Tran said she does not agree that the UPC allows this based on what is presented and that this was only Loucks opinion. Loucks read “Oil AND flammable liquid interceptors, 1017.0”, and noted there is not a distinction between them, they are the same. Tran said it is intended to be capable of handling flammables. Loucks stated that the UPC says the tanks, under 1017.0, applies to both oil and flammable. Tran agreed this was correct, however, she said PS80 isn’t specifically addressed, it is an alternate. Loucks agreed and said the Board could simply adopt an improved PS80. There aren’t any other standards they can look to other than D6104. You could also simply require everyone to meet D6104, which is also in chapter 14. If it is listed in chapter 14 then it is a standard that is covered under the code and would apply. It is simply a matter of whether the jurisdiction adopts what the codes says or reads too narrowly and excludes things that are provided for us to use. The vast majority of jurisdictions today use PS80 as a clarifier for oil and flammable liquids; there is no distinction in the vast majority of jurisdictions. Essentially Minnesota would then be saying that they want to be different in regards to how they interpret that, that is certainly the right of the Board, but this is how it is being used across the country. There is no clear alternate standard; there are not that many options. There is no reason for the Board not to accept PS80. Tran said as presented in the UPC 2012, PS80 clarifiers are only referenced to be accepted as alternates, on a case by case basis, up to the administrative authority per each city. Tran asked if Schier Products met PS80 and Loucks said no, they aren’t arguing this because they are trying to put themselves in a better position; they think this is the right thing for the Board to do. They won’t get any sales out of this deal. What they want the Board to do is simply adopt or simply list PS80 and/or ASTM D 6104 in chapter 10 and this would eliminate any confusion. Loucks added that IAPMO has also been frustrated over this confusion on how and when to apply a chapter 14 standard. The 2015 code will actually be putting the standards in the chapters they belong in, as well as referencing in chapter 14.

Justin said that UPC language gives a better opportunity for everyone to use the correct and the right product for the application. He preferred going with the Schier

Products RFA with some slight revisions and he added that the Board could resolve concerns by adding a statement to 1017 saying that these products, as per the standards, are acceptable. Parizek said PS80 and 6104 are alternate materials, they are not approved for that installation in the UPC and it is up to the administrative authority. If there is an issue with these not being associated with the oil and flammable liquid separators then that is an issue that needs to be addressed on a national level with IAPMO.

Jim Bauer asked if Schier Products is listed as UPC approved for oil clarifiers or UPC approved hydro mechanical grease interceptors. Loucks said that this particular partition is not related to Schier's approval status on an interceptor for oil applications. They don't have a certified oil interceptor, their case isn't to argue for approving Schier Products, they are trying to come to an agreement that there are standards that can be adopted and listed in chapter 10 of the Minnesota Plumbing Code that would adequately address any manufacturer moving forward. Loucks added that he would request the Board not make a requirement that both PS80 and ASTM D 6104 were met since they are not the same standards. PS80 governs clarifiers which are nationally accepted to be oil and flammable water separators and this is a construction standard only. ASTM D 6104 is actually a performance testing standard, it does not govern materials. You might say that the materials must meet the requirements of PS80 and performance testing might need to meet 6104 but you would want to be careful of making someone do both and limiting yourselves to new and emerging technologies that work better today.

Parizek said that approval of RFAs would be done in both national codes to move forward in the plumbing code. It is listed as an alternate project. Parizek asked if Loucks was working towards approval of 6104. Loucks stated yes and added that they are not aware of anyone that meets 6104. Most pre-treatment programs require PS80 construction on oil separators and they do allow for a variety of materials. Parizek said right now they are listed as alternates, they aren't listed as approved for that specific installation therefore he has an issue with approving a product that the UPC doesn't currently approve for that type of installation. The Board could look at keeping as an alternate product, up to the administrative authority to approve on a case by case basis until the 2015 version of IAPMO. Marciniak stated that IAPMO is proposing putting standards into the body of the code and they are discussing making a mandatory chart and a non-mandatory section. If it isn't in the body of the code and listed, it isn't necessary mandatory. This is still in process of being developed to the 2015 UPC. Parizek said we could address at our next code cycle – the 2015 UPC. Tran said there is a lot of discussion on performance of D6104; flammables are different especially with plastic – it permeates plastic pipe so the Board needs to consider long term and short term material. There is a concern with long term storage for flammables. Tran said that in moving forward with UPC, she doesn't know if it will be specific to adopting performance standards or construction material of the tank itself.

Loucks clarified that PS80 is a clarifier and to be clear, separators are separators – they have a job and they are going to be holding water the vast majority of the time. Their primary function is not to store pure petroleum oil or gasoline. These are separators that are filled with water 99.9% of their lives and may be required to pick up some residual oil depending on their application. Their job is to separate liquids. It should be easy to accept PS80 or other standards that simply give you a product that does the job correctly. Parizek said that nothing is finalized with code language until the Board takes a final vote, adjustments could still be made.

Legge agreed with Parizek and said her understanding is the vote of the Board, to date, has been to move forward and have language put into the Revisor's draft. Ultimately the Board will look at the final Revisor's draft, perhaps look at sections that shouldn't move forward, and then vote on the revised draft as a whole. This would require a 2/3 vote. To date, the Board has not adopted an amendment that would require a 2/3 vote for code amendment adoption in the statute.

Parizek said he would like to clarify how the board wants to move with this (language). Legge said that until the Revisor receives language, the Board doesn't know what the final language will be because the Revisor may change that language to conform to Minnesota Rule standards. It would not be possible to absolutely say this is the language that is moving forward until the Revisor's draft is received by the Board.

Parizek said that if the UPC language was kept as is, then those standards would be an alternate which is the way the UPC currently intends. It would then be on a case by case basis and the administrative authority would grant approval.

A Motion was made by Justin, seconded by Mount, to eliminate lines 41.16 through 43.2 of Section 4714.1017 Oil and Flammable Liquid Interceptors of the 5/13/2014 "Master Edits" Revisor's Draft. Original UPC language in 1017 would be retained. The majority vote ruled with 1 opposed; the motion carried.

Discussion regarding parking ramps and vehicle storage facilities followed the motion. Green Turtle said they are PS80 and can easily comply with 1017.2 and he added that there are manufacturers out there that meet these criteria.

Parizek asked the Board if an amendment should be made to section 4714.1017, the first sentence (line 41.17 of the above referenced Revisor's draft), to include the language "by the administrative authority".

A Motion was made by Mount, seconded by Filek, to leave language as is in 4714.1017; do not insert "by the administrative authority". The majority vote ruled with 1 opposed; the motion carried.

The meeting broke for lunch and resumed at 1:05 p.m.

D) Review of Revisor's draft of proposed Minnesota Rules chapter 4714 and consideration of modifications to the Revisor's draft. (Master Edits dated 5/13/14)

Legge clarified the Revisor may have already made wording changes to conform to MN style that wouldn't show up as hand-written changes. The Board was directed to review all content but it was noted that handwritten changes were only for formatting and punctuation; no changes were made to the intent of the language.

Parizek discussed Revisor changes that provided consistency throughout the draft and noted that language should be consistent with the UPC.

The Board reviewed the Revisor's Draft dated 5/13/14 and all changes will appear in the next Revisor's draft for a final review by the Board.

The Board agreed that all changes should be made to the Revisor's draft as discussed and sent back to the Revisor.

The Table in section 721 was added to the Revisor's draft and the Board noted they would like a separate handout for review.

VII. Complaints

None

VIII. Open Forum

John Schroeder, Schroeder Sales Company representative / Mechanical Engineer. Schroeder passed out a handout titled "Defense of the UPC Single Wall Heat Exchanger Language" dated 5/20/2014. (See attached document).

Schroeder discussed relative points to the Single Wall Heat Exchanger: 603.5.4 per the UPC does a very good job of protecting the health and safety of the public. Additional amendment #4 renders any residential applications of double wall heat exchangers economically unfeasible. The costs associated with installation and maintaining an RPZ offsets a good portion of the potential energy and cost savings associated with the indirect water heater. Schroeder summarized two key points: 1) Indirect heat exchangers are important because they do provide a huge potential for savings on an individual basis and collectively. 2) Cost savings from an energy perspective. Schroeder asked that the Board review the handout.

Parizek told Schroeder that the Board would be unable to make any decisions regarding his presentation today but that he could bring it up at the next (regular) board meeting. The Board would need to decide if single wall heat exchangers would be allowed or not allowed and if the language should be moved forward.

Schroeder asked if something less restrictive could be looked at other than an RPZ that doesn't have the inspection requirement. Parizek said more and more areas are going to containment rather than isolation and that a Board member can bring up this issue at

a regular meeting if they choose to do so. Schroeder said he could substantiate where his figures (handout attachment) came from.

Laura Millberg. Millberg submitted some corrections to the Revisor's draft and these changes will be given to Suzanne Todnem.

IX. Board Discussion

There was no discussion.

X. Announcements

Next SPECIAL Meeting

- i. June 10, 2014 @ 9:30 – Minnesota Room, DLI (tentative)

Next Regularly Scheduled Meetings

- i. July 15, 2014 @ 9:30 a.m. – Minnesota Room, DLI
(Annual Meeting - Election of Officers)
- ii. October 21, 2014 @ 9:30 a.m. – Minnesota Room, DLI

XI. Adjournment

The meeting was adjourned at 4:33 p.m. by consent.

Respectfully submitted,



Chad Filek

Plumbing Board Request for Interpretation

PRINT IN INK or TYPE

NAME OF SUBMITTER Harry Blonigen, President BHH Property Management Inc AND Chief Manager H&C Enterprises LLC License # BC452138	Rule(s) to be interpreted (e.g., 4715.0330) 4715.2330, 4715.2520, 4715.2530
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The Minnesota Plumbing Code (MN Rules, Chapter 4715) is available at www.dli.mn.gov/CCLD/PlumbingCode.asp.

Has a request for interpretation been submitted to Department of Labor and Industry (DLI) staff, either as a verbal request or a written request? Yes No

If "No," contact DLI staff at 651-284-5187. The DLI is responsible for administration and interpretation of the Minnesota Plumbing Code, and all requests must be processed and provided a DLI interpretation before being referred to the Plumbing Board. This form is intended to be used to request an interpretation from the Plumbing Board's Code Interpretation Committee only as a resolution of dispute with DLI interpretation.

Code/Rule to be interpreted: Venting requiremnts in violation, according to building official, Sid Fossan	Name of DLI employee gave interpretation: <i>SIM PETERSON SECTION CHIEF, JOHN ROEHL, GARY TOPP</i> Richard Lockrem	Date interpretation originally requested: 4-16-14
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Provide a copy of the DLI interpretation with this request (a copy must be provided as reference).

Is there a local dispute with an Inspector of other official? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If Yes, state the name or type of official Sid Fossan, Building Official
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State the circumstances of the initial dispute:

The building official claimed that the vent pipe penetrating the roof by going through the soffit was a violation, because the overhang and soffit "are not part of the roof" however if the vent pipe was moved over 6" to the interior of the SAME wall that the vent pipe would in fact be penetrating the roof. He cited three code rules, none of which is in violation.

The plumbing contractor received a verbal approval of the propped solution of going out the side wall and up through the roof, with the vent pipe being enclosed and insulated, PRIOR to work commencing, from a state plumbing official John Roeh.

On April 16th after Sid Fossan put a "STOP WORK ORDER" on the home I contacted Richard Lockrem and his initial observation was that what we did met code and was not in violation. Richard then had a meeting with other individuals in St Paul and called back that the people he met with had a consencus opinion that our venting solution was in fact up to code, and not in violation.

On April 16th, Greg Giza also had conversations with John Roehl and Gary Topp and was confident that we had met the applicable code requirements.

Explain what you believe the Code to read and why you disagree with the interpretation given to you by DLI staff.
 I have gone through each of the codes the building official has cited and given the justification for having satisfied the plumbing code in question. All of that is laid out in my emails to Richard Lockrem. Copies of those emails have been forwarded already, along with the photo attachments

List any other information you would like the Committee to consider:

Sid Fossen told me on March 7th that he had no problems and no issues with my workmanship, the quality of my projects, my knowledge of the building codes or my ability to follow them. He went on to say "I have a problem with Giza. They have been the kings of plumbing in Staples for a long time. Now they have some competiotion and they don't like it. That is going to change. I am in charge now!".

He clearly has a personal vendetta against Giza Plumbing and Heating Inc. for what ever reason.

I also submitted photos and questions about another project in Staples that Sid Fossan DID approve which CLEARLY had a number of code violations including safety, energy, electrical and potential for mold growth and air contamination to the public.

In the mean time, I am being prevented from working on my property. There is a lease contract in place with the tenants planning to move in on May 1st. This delay is causing me a substaintail amount of money.

BD 01 (3/10)

Information regarding submitting this form:

- Submit any supporting documentation to be considered electronically to DLI.CCLDBOARDS@state.mn.us. Once your Request For Interpretation form has been received, it will be assigned a file number. Please reference this file number on any correspondence and supplemental submissions.

Information for presentation to the Committee:

- You will be notified with the date of the Committee Meeting in which your Request For Interpretation will be heard.
- Limit presentations to 5 minutes or less.
- Be prepared to answer questions regarding the Code, the circumstances that led to the dispute and please bring copies of any documentation.

Information regarding Committee and/or Board function:

- The Code Interpretation Committee serves on behalf of the Plumbing Board to issue final interpretation.

What you can do if you disagree with the Committee's determination:

- If you would like to appeal the Code Interpretation Committee's determination, please notify us within thirty (30) days and it will be forwarded to the Administrative Law Judge for final interpretation.

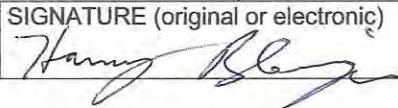
Office Use Only

RFI File No.	Date Received by DLI	Dated Received by Committee	Date of Committee Meeting
Title of RFI	By:		

This material can be made available in different forms, such as large print, Braille or on a tape. To request, call 1-800-342-5354 (DIAL-DLI) Voice or TDD (651) 297-4198.

I understand that the Code Interpretation Committee has the authority to issue final interpretation on behalf of the Plumbing Board.

Submitted by:

NAME Harry Blonigen, President AND Chief Manager		FIRM NAME BHH Property Management Inc. H&C Enterprises LLC BC452138		
ADDRESS 464 Ash St		CITY Aldrich	STATE MN	ZIP CODE 56434
PHONE 320 260-6642	SIGNATURE (original or electronic) 	DATE 4-23-2014		

For Assistance or questions on completing this form, please call 654-284-5898 or 651-284-5889.

Mailing address:

Plumbing Board
c/o Department of Labor and Industry
443 Lafayette Road North
St. Paul, MN 55155-4344

*** Please remember to attach all necessary explanations and supporting documentation***

April 17, 2014

Harry Blonigen
BHH Property Management, Inc.
464 Ash Street
Aldrich, MN 56434

RE: Plumbing Vent at 425 5th Street SE, Staples Minnesota and Stop Work Oder follow up correspondence.

Dear Mr. Blonigen,

On Wednesday April 16, 2014 I issued a stop work order to the plumber at the 425 5th Street SE in Staples Minnesota. Ordinarily I would have issued the stop work order to you the Owner, Contractor and Permit Holder, but you were not present so by code I issued the stop work order to your sub-contractor and placed the additional stop work order on the exterior of the door.

It is unfortunate that these plumbing code violations were not corrected earlier so you could have continued with your project. Apparently you are still not content with my interpretation of the code. That being the case, you have the right to appeal my decision with the State Plumbing Board. You apparently have all the contact information so I will not be including them in this document.

Mr. Lockrem assures me that he is sending all the data I sent to you with my March 7, 2014 letter as well as additional data from me to Mr. Lockrem to the State Plumbing Division.

A handwritten signature in black ink that reads "Sid Fossan". The signature is written in a cursive, flowing style.

Sid Fossan
Building Official

March 7, 2014

Harry Blonigen
BHH Property Management, Inc.
464 Ash Street
Aldrich, MN 56434

RE: Plumbing Vent at 425 5th Street SE, Staples Minnesota

Dear Harry,

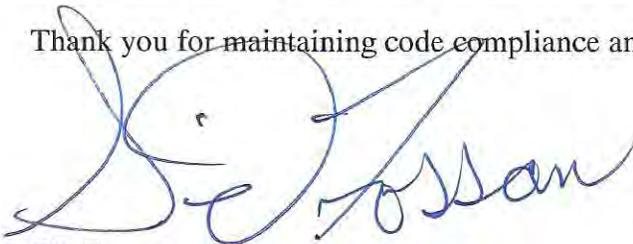
Prior to today, I reminded the plumber that the vent needed to exit through the roof. Today when I was inspecting your property I noticed the plumbing vent was exiting through the wall. You explained to me that the plumber had told you that it was ok as long as the vent remains ten feet away from any opening. After reviewing the code I believe the information given to you is incorrect. (See following Plumbing Codes sections)

4715.2330 Minimum Size of Stack Vent or Vent Stack.
4715.2520 Vent Stacks and Stack Vents.
4715.2530 Vent Terminals.

The new stack is the most remote and is a required vent. Subsequently it must remain full size through the roof. I can see where there may be some confusion when you look under 4715.2530, Subp. 3. Location of vent terminal. This refers to a vent going through a roof with possibly of a dormer with a window or small deck in the vicinity of the termination. It does not mean the vent can exit a sidewall and continue up the wall and then terminate.

Please make the required changes prior to final plumbing or final building inspections.

Thank you for maintaining code compliance and your quality of workmanship.



Sid Fossan
Building Official

enclosures

4715.2320 MINIMUM SIZE OF SOIL AND WASTE STACKS.

No soil or waste stack shall be smaller than the largest horizontal branch connected thereto except that a four by three water closet connection shall not be considered as a reduction in pipe size.

STAT AUTH: MS s 326.37 to 326.45; 326B.43 to 326B.49
HIST: L 2007 c 140 art 6 s 15; art 13 s 4

4715.2330 MINIMUM SIZE OF STACK VENT OR VENT STACK.

Any structure in which a building drain is installed shall have at least one stack vent or vent stack carried full size through the roof not less than three inches in diameter. Where one or more soil stacks are required to extend through the roof undiminished in size they should be the stack or stacks most remote from the location where the building drain leaves the building. When a soil or waste stack receives the discharge of fixtures located on two or more floors, and the uppermost fixture is located three or more floors above the building drain, such stack and stack vent shall continue undiminished in size through the roof. For purposes of this part, "floor" means any building floor level which is above the floor level of the building drain.

STAT AUTH: MS s 16B.59 to 16B.75; 326.37 to 326.45; 326B.101 to 326B.194; 326B.43 to 326B.49
HIST: 23 SR 686; L 2007 c 140 art 4 s 61; art 6 s 15; art 13 s 4; L 2008 c 337 s 64

4715.2340 PROVISION FOR FUTURE FIXTURES.

When provision is made for future installation of fixtures, those provided for shall be considered in determining the required sizes of drain and vent pipes. Construction to provide for such future installations shall be terminated with a plugged fitting or fittings.

STAT AUTH: MS s 326.37 to 326.45; 326B.43 to 326B.49
HIST: L 2007 c 140 art 6 s 15; art 13 s 4

4715.2350 MINIMUM SIZE OF UNDERGROUND DRAINAGE PIPING.

No portion of the drainage system installed underground shall be less than two inches in diameter.

STAT AUTH: MS s 326.37 to 326.45; 326B.43 to 326B.49
HIST: L 2007 c 140 art 6 s 15; art 13 s 4

4715.2360 SIZING OF OFFSETS ON DRAINAGE PIPING.

Subpart 1. Offsets of 45 degrees or less. An offset in a vertical stack with a change of direction of 45 degrees or less from the vertical may be sized as a straight vertical stack.

Subp. 2. Offsets of more than 45 degrees. A stack with an offset of more than 45 degrees from the vertical shall be sized as follows:

A. The portion of the stack above the offset shall be sized as for a regular stack based on the total number of fixture units above the offset.

B. The offset shall be sized as for a building drain branch, part 4715.2310, subpart 2.

C. The portion of the stack below the offset shall be sized at least as large as the offset.

Subp. 3. Above highest branch. An offset above the highest branch connection is an offset in the stack vent and shall be considered only as it affects the developed length of the vent.

Subp. 4. Below lowest branch. In the case of an offset in a soil or waste stack below the lowest branch connection, there shall be no change in diameter required if the offset is made at an angle of not greater than 45 degrees from the vertical.

If such offset is made at an angle of greater than 45 degrees from the vertical, the required diameter of the offset and the stack below it shall be sized as for a building drain. (Part 4715.2310, subpart 2.)

STAT AUTH: MS s 326.37 to 326.45; 326B.43 to 326B.49
HIST: L 2007 c 140 art 6 s 15; art 13 s 4

4715.2500 SELECTING SIZE OF VENT PIPING.

Subpart 1. **Size determined.** Vent pipe sizes shall be determined from part 4715.2520, subparts 5 and 6, on the basis of length and drainage load computed from part 4715.2300, subparts 2 and 3.

Subp. 2. **Minimum diameter of vent piping.** No vent pipe shall be less than 1-1/4 inches in diameter.

Subp. 3. **Individual vents.** The diameter of the individual vents shall be determined from part 4715.2520, subpart 6, but shall in no case be less than one-half the diameter of the fixture drain served.

Subp. 4. **Relief and yoke vents.** The diameter of relief and yoke vents shall be at least one-half the diameter of the soil and waste branch or stack served, nor less than the size of the vent to which they are connected.

Subp. 5. **Circuit or loop vents.** The diameter of circuit or loop vents shall be at least one-half the diameter of the horizontal soil or waste branch to which they connect. Maximum developed length as shown for fixture units in part 4715.2520, subpart 6. See part 4715.2600.

Subp. 6. **Branch vents.** The diameter of branch vents connecting more than one individual vent to a vent stack or stack vent shall be in accordance with part 4715.2520, subpart 6. The branch vent size shall be based upon the number of fixture units connected thereto, and the developed length of the branch vent measured from its vent stack (or stack vent) connection to the farthest fixture drain connection served by the branch vent.

Subp. 7. **Vent headers.** The diameter of vent headers shall be in accordance with part 4715.2520, subpart 6. The vent header size shall be based upon the sum of the fixture unit loads at the stacks vented through such section of the header, and the developed length shall be that of the vent stack having the longest developed length to the open air.

Subp. 8. **Vent stacks.** The diameter of the vent stacks shall be determined from part 4715.2520, subpart 5, based upon the size of the

soil or waste stacks served thereby, the number of fixture units connected to the soil or waste stack, and the developed length of the vent stack. Such developed length shall be measured from the lowest connection of the vent stack with the soil or waste stack to the open air.

STAT AUTH: MS s 326.37 to 326.45; 326B.43 to 326B.49
HIST: L 2007 c 140 art 6 s 15; art 13 s 4

4715.2510 PROTECTION OF TRAP SEALS.

The protection of trap seals from siphonage or back pressure shall be accomplished by the appropriate use of soil or waste stacks or vents, installed in accordance with requirements of this chapter, so that at no time the trap shall be subjected to a pressure differential of more than one inch of water.

STAT AUTH: MS s 326.37 to 326.45; 326B.43 to 326B.49
HIST: L 2007 c 140 art 6 s 15; art 13 s 4

4715.2520 VENT STACKS AND STACK VENTS.

Subpart 1. **Vent stack required.** For each sanitary building sewer, at least one three-inch vent stack (or stack vent) carried full size through the roof shall be installed as provided in part 4715.2330. A vent stack or main vent shall be installed with a soil or waste stack whenever individual vents, relief vents, or branch vents are required for stacks of three or more branch intervals.

Subp. 2. **Connections at base and top.** For stacks of three or four branch intervals in height, all main vents or vent stacks shall connect full size at their base to the main soil or waste stack below, through, or not more than 18 inches above the lowest fixture branch.

For stacks of five or more branch intervals in height, a main vent or vent stack shall connect full size with the soil or waste stack it serves, with a wye and one-eighth bend below the lowest fixture branch connected to such soil or waste stack, or at a point approved by the administrative authority.

Each such soil or waste stack, and vent stack shall be similarly cross-connected with a yoke

4715.2530 VENT TERMINALS.**Subpart 1. Extension above roofs.**

Extension of vent pipes through a roof shall be terminated not less than 12 inches above it. Where a roof is to be used for any purpose other than weather protection, the vent extensions shall be run at least seven feet above the roof.

Subp. 2. **Waterproof flashings.** Each vent terminal shall be made watertight with the roof by proper flashing of copper, lead, galvanized iron, or other approved flashings or flashing materials. Vent pipe terminals shall pass through the roof and shall be at least two inches in diameter. When approved by the administrative authority, other materials or methods may be used which provide adequate protection.

Subp. 3. **Location of vent terminal.** No vent terminal shall be located directly beneath any door, window, or other ventilating opening of the building or of an adjacent building nor shall any such vent terminal be within ten feet horizontally of such an opening unless it is at least two feet above the top of such opening.

Subp. 4. **Terminals adjoining high buildings.** In the event that a new building is built higher than an existing building, the owner of the new building shall not locate openable windows, doors, or other ventilating openings within ten feet of any existing vent stack on the lower building unless the owner of such new building shall defray the expenses or shall make such alterations to conform to part 4715.2530, subpart 3.

STAT AUTH: MS s 326.37 to 326.45; 326B.43 to 326B.49
HIST: 17 SR 1279; L 2007 c 140 art 6 s 15; art 13 s 4

4715.2540 VENT GRADES AND CONNECTIONS.

Subpart 1. **Vent grade.** All vent and branch vent pipes shall be so graded and connected as to drain back to a soil or waste pipe by gravity.

Subp. 2. **Vertical rise.** Where vent pipes connect to a horizontal soil or waste pipe, the vent shall be taken off above the center line of the pipe. The vent pipe shall rise vertically, or at an angle not more than 45 degrees from the

vertical, to a point at least six inches above flood-level rim of the fixture it is venting, before offsetting horizontally or before connecting to the branch vent.

Subp. 3. **Height above fixtures.** A connection between a vent pipe and a vent stack or stack-vent shall be made at least six inches above the flood-level rim of the highest fixture served by the vent. Horizontal vent pipes forming branch vents, relief vents, or loop vents shall be at least six inches above the flood-level rim of the highest fixture served.

STAT AUTH: MS s 326.37 to 326.45; 326B.43 to 326B.49
HIST: L 2007 c 140 art 6 s 15; art 13 s 4

4715.2550 WET VENTING.

Subpart 1. **Single bathroom groups.** A single bathroom group of fixtures may be installed with the drain from a backvented lavatory, kitchen sink, or combination fixture serving as a wet vent for a bathtub or shower stall provided that:

A. not more than one fixture unit is drained into a 1-1/2 inch diameter wet vent or not more than four fixture units drain into a two inch diameter wet vent; and

B. the horizontal branch drain connects to the stack at or below the same level as the water closet drain when installed on the top floor.

Subp. 2. **Double bathroom groups back-to-back.** Bathroom groups back-to-back consisting of two lavatories and two bathtubs or shower stalls may be installed on the same horizontal branch with a common vent for the lavatories and with no back vent for the bathtubs or shower stalls, provided the wet vent is not less than two inches in diameter.

Subp. 3. **Basement shower.** A basement shower may be wet vented through the waste from a laundry tub, lavatory, or sink, provided the wet vent is not less than two inches in diameter, and the drain conforms to part 4715.2620, subpart 4.

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Does Not mean 76.5*

Plumbing Board Request for Action

PRINT IN INK or TYPE

NAME OF SUBMITTER

Charlie Ismert, Schier Products

PURPOSE OF REQUEST (check all that apply): New Code
 Code Amendment Repeal of an existing Rule

The Minnesota Plumbing Code (MN Rules, Chapter 4715) is available at www.dli.mn.gov/CCLD/PlumbingCode.asp.

Specify the purpose of the proposal: (If recommendation for code change for fixture, appurtenance, material, or method, check all that apply)

Material Method of installation, joining, etc., Fixture Appurtenance (e.g., water conditioning equipment)
 Test Method Other (describe) Sizing and Design requirements

Does your submission contain a Trade Secret? Yes No

If Yes, mark “**TRADE SECRET**” prominently on each page of your submission that you believe contains trade secret information. Minnesota Statutes, section 13.37, subdivision 1(b), defines “trade secret” as follows:

“Trade secret information” means government data, including a formula, pattern, compilation, program, device, method, technique or process (1) that was supplied by the affected individual or organization, (2) that is the subject of efforts by the individual or organization that are reasonable under the circumstances to maintain its secrecy, and (3) that derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use.

Note that, although “trade secret” information is generally not public, the Board and its committees may disclose “trade secret” information at a public meeting of the Board or committee if reasonably necessary for the Board or committee to conduct the business or agenda item before it (such as your request.) The record of the meeting will be public.

Describe the proposed change. The Minnesota Plumbing Code (Minnesota Rules Chapter 4715) is available via the World Wide Web at <http://www.revisor.leg.state.mn.us/arule/4715/>

NOTE:

- Please review the Minnesota Plumbing Code and include all parts of the Code that require revision to accomplish your purpose.
- The proposed change, including suggested rule language, should be *specific*. If modifying existing rule language, underline new words and ~~strike through deleted words~~. Please list all areas of the Minnesota Plumbing Code that would be affected.

4715.1120 OIL AND FLAMMABLE LIQUIDS SEPARATOR
 EXISTING CODE (ATTACHED SEPARATELY) CAN ALSO BE FOUND HERE:
<https://www.revisor.mn.gov/rules/?id=4715.1120>

Request for action is strike out the existing code in its entirety and to adopt pertinent language regarding Oil Separators from Chapter 10 of the 2009 Uniform Plumbing Code with no suggested amendments. As follows:

1017.0 Oil and Flammable Liquid Interceptors.

1017.1 Interceptors Required. All repair garages and gasoline stations with grease racks or grease pits, and all 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 all necessary floor drains. The separation or vapor compartment shall be independently vented to the outer air. If two (2) 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 six (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 two (2) inches (50 mm), and, when vented through a side-wall, the vent shall be not less than ten (10) feet (3,048 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. All oil and flammable interceptors shall be provided with gastight cleanout covers that shall be readily accessible. The waste line shall be not less than three (3) inches (80 mm) in diameter with a fullsize cleanout to grade. When an interceptor is provided with an overflow, it shall be provided with an overflow line (not less than two (2) inches (50 mm) in diameter) to an approved waste oil tank having a minimum capacity of five-hundred fifty (550) gallons (2,082 L) and meeting the requirements of the Authority Having Jurisdiction. The waste oil from the separator 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 two (2) inch (50 mm) minimum pump-out connection at grade and a one and one-half (1-1/2) inch (40 mm) minimum vent to atmosphere at an approved location not less than ten (10) feet (3,048 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/m). 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 two (2) feet (610 mm) below the invert of the discharge drain. The outlet opening shall have not less than an eighteen (18) inch (457 mm) water seal and shall have a minimum capacity as follows: Where not more than three (3) motor vehicles are serviced and/or stored, interceptors shall have a minimum capacity of six (6) cubic feet (0.17 m3), and one (1) cubic foot (0.03 m3) of capacity shall be added for each vehicle up to ten (10) vehicles. Above ten (10) vehicles, the Authority Having Jurisdiction shall determine the size of the interceptor required. Where vehicles are serviced only and not stored, interceptor capacity shall be based on a net capacity of one (1) cubic foot (0.03 m3) for each one-hundred (100) square feet (9.29 m2) of surface to be drained into the interceptor with a minimum of six (6) cubic feet (0.17 m3).

Office Use Only

RFA File No.	Date Received by DLI	Dated Received by Committee	Date of Forwarded to Board
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Title of RFA	By:
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Committee Recommendation to the Board: Accept Reject Abstain

Board approved as submitted: Yes No Board approved as modified: Yes No

This material can be made available in different forms, such as large print, Braille or on a tape. To request, call 1-800-342-5354 (DIAL-DLI) Voice or TDD (651) 297-4198.

Need and Reasons For the Change. Thoroughly explain the need and why you believe it is reasonable to make this change. During a rulemaking process, the need and reasonableness of all proposed rule changes must be justified; therefore, a detailed explanation is necessary to ensure the Board thoroughly considers all aspects of the proposal.

The three primary reasons for the change are as follows:

1. Sizing: current Minnesota Plumbing Code sizing abides by a "one-size-fits-all" approach to sizing Oil and Flammable Liquids Separators (referred to from here on as "oil separators"). The current sizing requirement is for a 35 cubic foot (approx. 260 liquid gallons) vessel. Bearing in mind the vast differences that can be found based on jobsite type and drainage footprint, the need for a more accurate sizing method only makes sense, as shown in the provided UPC version above.
2. Design: current Minnesota Plumbing Code design requirements per drawing MA1006 show a cylindrical vessel with a liquid capacity of 36 cubic feet, 24" cover OD, 4" drain connections, a short 90 on the inlet and a 21" deep 90 on the outlet. As best as can be determined, there is no real basis for performance with this design. Existing market designs have been found to offer superior oil separation with the inclusion of diffusers or baffles. But because of the way the drawing is shown, such superior performing designs are not code compliant.
3. Materials: current Minnesota Plumbing Code says the following for sizing: "The separator may be constructed either: (i) of monolithic poured reinforced concrete with a minimum floor and wall thickness of six inches, (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." Such requirements unjustly disallow the use of High Density Polyethylene (HDPE) which have been used for the construction of oil separators for over 30 years. To attest to this fact, Schier Products provides the only lifetime warranty for corrosion and structural integrity on the market. Concrete and steel manufacturers do not and would not provide such warranties as these materials will fail in time. We are not asking that any materials be necessarily disallowed; we are only asking that the code language for materials be left generic as shown in the UPC version above.

Standards and Product Approvals or Listings: Your product/method must conform to a referenced standard(s) listed in the IPC and the UPC. Please check which national code the standard(s) of your product/method are currently listed in:
 IPC UPC

If your product/method standard(s) is not currently listed in both national codes, your Request For Action will not be considered by the Board or its committees, however, you are welcome to present at any Board meeting during the Open Forum section of the Agenda.

The proposal must be accompanied by copies of any published standards, the results of testing, and copies of any product listings, as documentation of the health, sanitation and safety performance of any materials, methods, fixtures, and/or appurtenances. If none are available, please explain:

Because we are only asking for the substitution of the current code with the UPC version, we are not providing any additional standards, or suggesting that any be adopted. However, Chapter 14 of the Uniform Plumbing Code does list the following performance standard for Oil Separators:

ASTM D 6104-1997 (R2003)

Determining the Performance of Oil/Water Separators Subjected to Surface Run-Off Fixtures

Also, while we are asking for material constraints to be lifted by way of the adoption of the 2009 UPC, please be advised that Schier Products HDPE oil separators are manufactured to meet or beat the following standards:

1. ASTM D1248 (Standard Specification for Polyethylene Plastics Extrusion Materials For Wire and Cable), Class B (requiring an ultraviolet stabilizer)
2. ASTM D 1693 (Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics) with a value greater than or equal to twenty-four hundred (2,400) psi (16.56 MPa) and with a flexural modulus of elasticity greater than or equal to eighty five thousand (85,000) psi (586.1 MPa)

Please attach electronic scanned copies of any literature, standards and product approvals or listings. Printed or copyrighted materials, **along with written permission from the publisher to distribute the materials at meetings**, should be sent to the Plumbing Board, c/o Department of Labor and Industry, 443 Lafayette Road No., St. Paul, MN 55155-4344.

Primary reason for change: (check only one)

- Protect public, health, safety, welfare, or security
- Lower construction costs
- Encourage new methods and materials
- Change made at national level
- Other (describe) _____
- Mandated by legislature
- Provide uniform application
- Clarify provisions
- Situation unique to Minnesota

Anticipated benefits: (check all that apply)

- Save lives/reduce injuries
- Improve uniform application
- Improve health of indoor environment
- Provide more construction alternatives
- Reduce regulation
- Other (describe) _____
- Provide more affordable construction
- Provide building property
- Drinking water quality protection
- Decrease cost of enforcement

Economic impact: (explain all answers marked "yes")

1. Does the proposed change increase or decrease the cost of enforcement? Yes No If yes, explain
No change.

2. Does the proposed change increase or decrease the cost of compliance? Yes No If yes, explain
Include the estimated cost increase or decrease, and who will bear the cost increase or experience the cost decrease:
If, we're talking for the "customer" the answer is both. For smaller applications that that would be sized for a smaller oil separator per UPC sizing, the cost should go down. For larger applications that would be sized for an oil separator larger than the current requirements, cost may go up.

3. Are there less costly or intrusive methods to achieve the proposed change? Yes No If yes, explain
Instead of sizing oil separators based on the number of vehicles, it might be worth considering sizing oil separators based on the drain line pipe size, and other factors such as application type (IE: car wash versus a parking garage, etc.). Also the requirement for a 550 gallon oil collection tank when an oil draw-off arm is unnecessarily large.

4. Were alternative methods considered? Yes No If no, why not? If yes, explain what alternative methods were considered and why they were rejected.
Chapter 10 of the International Plumbing Code has similar lanage to the Uniform Plumbing Code. However, the UPC was chosen as there is precedent for doing so with the Grease Interceptor RFA, and because of the reciprocal benefit of Iowa, North Dakota and South Dakota where the Uniform Plumbing Code is currently used.

5. If there is a fiscal impact, try to explain any benefit that will offset the cost of the change. If there is no impact, mark "N/A." Yes, as explained on question number 2 above. The other fiscal benefit is for manufacturers of oil separators (like Schier Products) who are currently "locked out" by code, but who have been successfully selling oil separators across the country for decades. Also, removing the ban on perfectly suitable and lightweight materials like Schier's HDPE oil separators will allow for contractors to install the units with the heavy lifting equipment needed for installation of currently allowable materials.

6. Provide a description of the classes of persons affected by a proposed change, who will bear the cost, and who will benefit. The cost would be absorbed by the owners of buildings where oil separators are required. As described earlier, however, this might mean a cost savings or additional cost, depending on the requirements of that specific application.

7. Does the proposed rule affect farming operations? (Agricultural buildings are exempt from the Minnesota Building Code under Minnesota Statutes, Section 326B.121.) Yes No If yes, explain

Are there any existing Federal Standards? Yes No If yes, list:
The EPA Cleanwater Act of 1972 regulates discharge limits of oil and flammable wastes in drainage systems.

Are there any differences between the proposed change and existing federal regulations? Yes No
 Not applicable Unknown If yes, describe each difference & explain why each difference is needed & reasonable.

Minnesota Statutes, section 14.127, requires the Board to determine if the cost of complying with proposed rule changes in the first year after the changes take effect will exceed \$25,000 for any small business or small city. A small business is defined as a business (either for profit or nonprofit) with less than 50 full-time employees and a small city is defined as a city with less than ten full-time employees.

During the first year after the proposed changes go into effect, will it cost more than \$25,000 for any small business or small city of comply with the change? Yes No If yes, identify by name the small business(es or small city(ies). Existing installations would be grandfathered. The new code would only affect new construction, or when an existing installation requires renovation.

Will this proposed plumbing code amendment require any local government to adopt or amend an ordinance or other regulation in order to comply with the proposed plumbing code amendment? Yes No, If yes, identify by name the government(s) and ordinances(s) that will need to be amended in order to comply with the proposed plumbing code amendment.

Additional supporting documentation may also be attached to this form. Are there any additional comments you feel the Committee/Board may need to consider? If so, please state them here:

Information regarding submitting this form:

- Submissions are received and heard by the Committee on an “as received” basis. **Any missing documentation will delay the process, and your proposal will be listed as the date it was received “Complete.”**
- **Submit any supporting documentation to be considered**, such as manufacturer’s literature, approvals by other states, and engineering data electronically to DLI.CCLDBOARDS@state.mn.us. Once your Request For Action form has been received, it will be assigned a file number. Please reference this file number on any correspondence and supplemental submissions.
- **For copyrighted materials that must be purchased from publishers, such as published standards, product approvals or testing data, listings by agencies (IAPMO, ASSE, ASTM, etc.) you may send just 2 copies, along with written permission from the publisher to distribute the materials at meetings, via U.S. Mail to: Plumbing Board, c/o Department of Labor and Industry, 443 Lafayette Road No., St. Paul, MN 55155-4344.**
- **For materials that must be submitted by U.S. Mail, please include a copy of your “Request For Action” form originally submitted and reference your assigned RFA file number.**

Information for presentation to the Committee and/or Board:

- Limit presentations to 5 minutes or less.
- Be prepared to answer questions regarding the proposal and any documentation.

Information regarding Committee and/or Board function:

- The Product and Code Review Committee serves to advise the Plumbing Board.

I understand that any action of the Product and Code Review Committee is a recommendation to the Plumbing Board and is not to be considered final action.

NAME AND E-MAIL ADDRESS	FIRM NAME
Charlie Ismert, charlie.ismert@schierproducts.com	Schier Products

NAME, PHONE NUMBER AND E-MAIL ADDRESS OF PRESENTER TO THE COMMITTEE (if different):

Same

ADDRESS	CITY	STATE	ZIP CODE
9500 Woodend Rd	Edwardsville	KS	66111
PHONE	SIGNATURE (original or electronic)	DATE	
800-827-7119	Charles M Ismert	May 8, 2012	

For Assistance or questions on completing this form, contact Cathy Tran, Department of Labor and Industry at 651-284-5898.

For Office/Committee Use Only Proposal received completed? Yes No

Date Proposer notified of gaps:	Mode of notification (e.g., e-mail)	Date returned to Proposer:	Date materials re-received:

CHAPTER 10

TRAPS AND INTERCEPTORS

1001.0 Traps Required.

1001.1 Each plumbing fixture, excepting those having integral traps or as permitted in Section 1001.2, shall be separately trapped by an approved type of water seal trap. Not more than one (1) trap shall be permitted on a trap arm.

1001.2 One (1) trap shall be permitted to serve a set of not more than three (3) single compartment sinks or laundry tubs of the same depth or three (3) lavatories immediately adjacent to each other and in the same room if the waste outlets are not more than thirty (30) inches (762 mm) apart and the trap is centrally located when three (3) compartments are installed.

1001.3 No food waste disposal unit shall be installed with any set of restaurant, commercial, or industrial sinks served by a single trap; each such food waste disposal unit 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. No clothes washer or laundry tub shall be connected to any trap for a kitchen sink.

1001.4 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 any fixture exceed twenty-four (24) inches (610 mm) in length.

1002.0 Traps Protected by Vent Pipes.

1002.1 Each plumbing fixture trap, except as otherwise provided in this code, shall be protected against siphonage, back-pressure, and air circulation shall be

assured throughout all parts of the drainage system by means of a vent pipe installed in accordance with the requirements of this code.

1002.2 Each fixture trap shall have a protecting vent so located that the developed length of the trap arm from the trap weir to the inner edge of the vent shall be within the distance given in Table 10-1, but in no case less than two (2) times the diameter of the trap arm.

1002.3 A trap arm shall be permitted to change direction without the use of a cleanout when such change of direction does not exceed 90 degrees (1.6 rad). All horizontal changes in direction of trap arms shall comply with Section 706.3.

Exception: For trap arms three (3) inches (80 mm) in diameter and larger, the change of direction shall not exceed 135 degrees (2.36 rad) without the use of a cleanout.

1002.4 The vent pipe opening from a soil or waste pipe, except for water closets and similar fixtures, shall not be below the weir of the trap.

1003.0 Traps — Described.

1003.1 Each trap, except for traps within an interceptor or similar device shall be self-cleaning. Traps for bathtubs, showers, lavatories, sinks, laundry tubs, floor drains, urinals, drinking fountains, dental units, and similar fixtures shall be of standard design, weight and shall be of ABS, cast brass, cast iron, lead, PP, PVC, or other approved material. An exposed and readily accessible drawn-brass tubing trap, not less than 17 B & S Gauge (0.045 inch) (1.1

TABLE 10-1
Horizontal Lengths of Trap Arms
(Except for water closets and similar fixtures)*

Trap Arm Pipe Diameter	Distance Trap to Vent Minimum	Length Maximum	Trap Arm Pipe Diameter	Distance Trap to Vent Minimum	Length Maximum
1-1/4"	2-1/2"	30" (2'-6")	32 mm	64 mm	762 mm
1-1/2"	3"	42" (3'-6")	40 mm	76 mm	1,067 mm
2"	4"	60" (5'-0")	50 mm	102 mm	1,524 mm
3"	6"	72" (6'-0")	80 mm	152 mm	1,829 mm
4"	8"	120" (10'-0")	100 mm	203 mm	3,048 mm
Exceeding 4"	2 x Diameter	120" (10'-0")	Exceeding 100 mm	2x Diameter	3,048 mm

Maintain one-fourth (1/4) inch per foot slope (20.8 mm/m)

* The developed length between the trap of a water closet or similar fixture (measured from the top of the closet, flange to the inner edge of the vent) and it's vent shall not exceed six (6) feet (1,829 mm)

mm), shall be permitted to be used on fixtures discharging domestic sewage.

Exception: Drawn-brass tubing traps shall not be used for urinals. Each trap shall have the manufacturer's name stamped legibly in the metal of the trap, and each tubing trap shall have the gauge of the tubing in addition to the manufacturer's name. Every trap shall have a smooth and uniform interior waterway.

1003.2 A maximum of one (1) approved slip joint fitting shall be permitted to be used on the outlet side of a trap, and no tubing trap shall be installed without a listed tubing trap adapter. Listed plastic trap adapters shall be permitted to be used to connect listed metal tubing traps.

1003.3 The size (nominal diameter) of a trap for a given fixture shall be sufficient to drain the fixture rapidly, but in no case less than nor more than one (1) pipe size larger than given in Table 7-3. The trap shall be the same size as the trap arm to which it is connected.

1004.0 Traps — Prohibited.

No form of trap that depends for its seal upon the action of movable parts shall be used. No trap that has concealed interior partitions, except those of plastic, glass, or similar corrosion-resisting material, shall be used. "S" traps, bell traps, and crown-vented traps shall be prohibited. No fixture shall be double trapped. Drum and bottle traps shall be installed only for special conditions. No trap shall be installed without a vent, except as otherwise provided in this code.

1004.1 Bladders, check valves or any other type of devices with moveable parts shall be prohibited to serve as a trap.

1005.0 Trap Seals.

Each fixture trap shall have a liquid seal of not less than two (2) inches (51 mm) and not more than four (4) inches (102 mm), except where a deeper seal is found necessary by the Authority Having Jurisdiction. Traps shall be set true with respect to their liquid seals and, where necessary, they shall be protected from freezing.

1006.0 Floor Drain Traps.

Floor drains shall connect into a trap so constructed that it can be readily cleaned and of a size to serve efficiently the purpose for which it is intended. The drain inlet shall be so located that it is at all times in full view. When subject to reverse flow of sewage or liquid waste, such drains shall be equipped with an approved backwater valve.

1007.0 Trap Seal Protection.

Floor drain or similar traps directly connected to the drainage system and subject to infrequent use shall be protected with a trap seal primer, except where not deemed necessary for safety or sanitation by the Authority Having Jurisdiction. Trap seal primers shall be accessible for maintenance.

1008.0 Building Traps.

Building traps shall not be installed except where required by the Authority Having Jurisdiction. Each building trap when installed shall be provided with a cleanout and with a relieving vent or fresh-air intake on the inlet side of the trap, which need not be larger than one-half the diameter of the drain to which it connects. Such relieving vent or fresh-air intake shall be carried above grade and terminate in a screened outlet located outside the building.

1009.0 Industrial Interceptors (Clarifiers) and Separators.

1009.1 When Required. Interceptors (clarifiers) (including grease, oil, sand interceptors [clarifiers], etc.) shall be required by the Authority Having Jurisdiction when they are necessary for the proper handling of liquid wastes containing grease, flammable wastes, sand, solids, acid or alkaline substances, or other ingredients harmful to the building drainage system, the public or private sewer, or to public or private sewage disposal.

1009.2 Approval. The size, type, and location of each interceptor (clarifier) or separator shall 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 any interceptor (clarifier).

1009.3 Design. Interceptors (clarifiers) for sand and similar heavy solids shall be so designed and located as to be readily accessible for cleaning and shall have a water seal of not less than six (6) inches (152 mm).

1009.4 Relief Vent. Interceptors (clarifiers) shall be so designed that they will not become air-bound if closed covers are used. Each interceptor (clarifier) shall be properly vented.

1009.5 Location. Each interceptor (clarifier) cover shall be readily accessible for servicing and maintaining the interceptor (clarifier) in working and operating condition. The use of ladders or the removal of bulky equipment in order to service interceptors (clarifiers) shall constitute a violation of accessibility. Location of all interceptors (clarifiers) shall be shown on the approved building plan.

1009.6 Maintenance of Interceptors. Interceptors shall be maintained in efficient operating condition

by periodic removal of accumulated grease, scum, oil, or other floating substances and solids deposited in the interceptor.

1009.7 Discharge. The waste pipe from oil and sand interceptors shall discharge as approved by the Authority Having Jurisdiction.

1010.0 Slaughterhouses, Packing Establishments, etc.

Every fish, fowl, and animal slaughterhouse or establishment; every fish, fowl, and meat packing or curing establishment; every soap factory, tallow-rendering, fat-rendering, and hide-curing establishment shall be connected to and shall drain or discharge into an approved grease interceptor (clarifier).

1011.0 Minimum Requirements for Auto Wash Racks.

Every private or public wash rack and/or floor or slab used for cleaning machinery or machine parts shall be adequately protected against storm or surface water and shall drain or discharge into an approved interceptor (clarifier).

1012.0 Commercial and Industrial Laundries.

Laundry equipment in commercial and industrial buildings that does not have integral strainers shall discharge into an interceptor having a wire basket or similar device that is removable for cleaning and that will prevent passage into the drainage system of solids one-half (1/2) inch (12.7 mm) or larger in maximum dimension, such as string, rags, buttons, or other solid materials detrimental to the public sewerage system.

1013.0 Bottling Establishments.

Bottling plants shall discharge their process wastes into an interceptor that will provide for the separation of broken glass or other solids, before discharging liquid wastes into the drainage system.

1014.0 Grease Interceptors.

1014.1 Where it is determined by the Authority Having Jurisdiction that waste pretreatment is required, an approved type of grease interceptor(s) complying with the provisions of this section shall be correctly sized and properly installed in grease waste line(s) leading from sinks and drains, such as floor drains, floor sinks and other fixtures or equipment in serving establishments such as restaurants, cafes, lunch counters, cafeterias, bars and clubs, hotels, hospitals, sanitariums, factory or school kitchens, or other establishments where grease is introduced into the drainage or sewage system in quantities that can

effect line stoppage or hinder sewage treatment or private sewage disposal. Any combination of hydromechanical, gravity grease interceptors and engineered systems shall be allowed in order to meet this code and other applicable requirements of the Authority Having Jurisdiction when space or existing physical constraints of existing buildings necessitate such installations. A grease interceptor shall not be required for individual dwelling units or for any private living quarters. Water closets, urinals, and other plumbing fixtures conveying human waste shall not drain into or through the grease interceptor.

1014.1.1 Each fixture discharging into a grease interceptor shall be individually trapped and vented in an approved manner.

1014.1.2 All grease interceptors shall be maintained in efficient operating condition by periodic removal of the accumulated grease and latent material. No such collected grease shall be introduced into any drainage piping or public or private sewer. If the Authority Having Jurisdiction determines that a grease interceptor is not being properly cleaned or maintained, the Authority Having Jurisdiction shall have the authority to mandate the installation of additional equipment or devices and to mandate a maintenance program.

1014.1.3 Food Waste Disposal Units and Dishwashers. Unless specifically required or permitted by the Authority Having Jurisdiction, no food waste disposal unit or dishwasher shall be connected to or discharge into any grease interceptor. Commercial food waste disposers shall be permitted to discharge directly into the building's drainage system.

1014.2 Hydromechanical Grease Interceptors.

1014.2.1 Plumbing fixtures or equipment connected to a Type A and B hydromechanical grease interceptor shall discharge through an approved type of vented flow control installed in a readily accessible and visible location. Flow control devices shall be designed and installed so that the total flow through such device or devices shall at no time be greater than the rated flow of the connected grease interceptor. No flow control device having adjustable or removable parts shall be approved. The vented flow control device shall be located such that no system vent shall be between the flow control and the grease interceptor inlet. The vent or air inlet of the flow control device shall connect with the sanitary drainage vent system, as elsewhere required by this code, or shall terminate through the roof of the building, and shall not terminate to the free atmosphere inside the building.

Exception: Listed grease interceptors with integral flow controls or restricting devices shall be installed in an accessible location in accordance with the manufacturers' instructions.

1014.2.2 The total capacity in gallons (L) of fixtures discharging into any hydromechanical grease interceptor shall not exceed two and one-half (2-1/2) times the certified GPM (L/m) flow rate of the interceptor as per Table 10-2.

For the purpose of this section, the term "fixture" shall mean and include each plumbing fixture, appliance, apparatus, or other equipment required to be connected to or discharged into a grease interceptor by any provision of this section.

1014.2.3 A vent shall be installed downstream of hydromechanical grease interceptors in accordance with the requirements of this code.

1014.3 Gravity Grease Interceptors. Required gravity grease interceptors shall comply with the provisions of Sections 1014.3.1 through 1014.3.7.

1014.3.1 General. The provisions of this section shall apply to the design, construction, installation, and testing of commercial kitchen gravity grease interceptors.

1014.3.2 Waste Discharge Requirements.

1014.3.2.1 Waste discharge in establishments from fixtures and equipment which contain grease, including but not limited to, scullery sinks, pot and pan sinks, dishwashers, soup kettles, and floor drains located in areas where grease-containing materials exist, shall be permitted to be drained into the sanitary waste through the interceptor when approved by the Authority Having Jurisdiction.

**TABLE 10-2
Hydro-mechanical Interceptor Sizing Using Gravity Flow Rates¹**

Diameter of Grease Waste Pipe	Maximum Full Pipe Flow (gpm) ²	Size of Grease Interceptor	
		One-Minute Drainage Period (gpm)	Two-Minute Drainage Period (gpm)
2"	20	20	10
3"	60	75	35
4"	125	150	75
5"	230	250	125
6"	375	500	250

¹ For interceptor sizing by fixture capacity see the example below.

² 1/4" (.240) slope per foot based on Manning's formula with friction factor N = .012

**EXAMPLE FOR SIZING
HYDROMECHANICAL INTERCEPTOR(S) USING FIXTURE CAPACITY**

Step 1: Determine the flow rate from each fixture.

$$[\text{Length}] \times [\text{Width}] \times [\text{Depth}] / [2.31] = \text{Gallons} \times [.75 \text{ fill factor}] / [\text{Drain Period (1 min or 2 min)}]$$

Step 2: Calculate the total load from all fixtures that discharge into the interceptor.

Fixtures	Compartments	Load (gallons)	Size of Grease Interceptor	
			One-Minute Drainage Period (gpm)	Two-Minute Drainage Period (gpm)
Compartment size 24"x 24"x 12"	2	44.9		
Hydrant		3		
Rated Appliance		2		
		49.9	50	25

Table 10-3
Gravity Grease Interceptor Sizing

DFUs (1,3)	Interceptor Volume (2)
8	500 gallons
21	750 gallons
35	1,000 gallons
90	1,250 gallons
172	1,500 gallons
216	2,000 gallons
307	2,500 gallons
342	3,000 gallons
428	4,000 gallons
576	5,000 gallons
720	7,500 gallons
2112	10,000 gallons
2640	15,000 gallons

Notes

- (1) The maximum allowable DFUs plumbed to the kitchen drain lines that will be connected to the grease interceptor.
- (2) This size is based on: DFUs, the pipe size from this code; Table 7-5; Useful Tables for flow in half-full pipes (ref: *Mohinder Nayyar Piping Handbook*, 3rd Edition, 1992). Based on 30-minute retention time (ref.: George Tchobanoglous and Metcalf & Eddy. *Wastewater Engineering Treatment, Disposal and Reuse*, 3rd Ed. 1991 & Ronald Crites and George Tchobanoglous. *Small and Decentralized Wastewater Management Systems*, 1998). Rounded up to nominal interceptor volume.
- (3) When the flow rate of directly connected fixture(s) or appliance(s) have no assigned DFU values, the additional grease interceptor volume shall be based on the known flow rate (gpm) multiplied by 30 minutes.

1014.3.2.2 Toilets, urinals, and other similar fixtures shall not drain through the interceptor.

1014.3.2.3 All waste shall enter the interceptor through the inlet pipe only.

1014.3.3 Design.

1014.3.3.1 Gravity Interceptors shall be constructed in accordance with the applicable standard in Table 14-1 or the design approved by the Authority Having Jurisdiction.

1014.3.4 Location.

1014.3.4.1 Each grease interceptor shall be so installed and connected that it shall be at all times easily accessible for inspection, cleaning, and removal of the intercepted grease. A gravity grease interceptor complying with IAPMO Z1001, shall not be installed in any part of a building where food is handled. Location of the grease interceptor shall meet the approval of the Authority Having Jurisdiction.

1014.3.4.2 Interceptors shall be placed as close as practical to the fixtures they serve.

1014.3.4.3 Each business establishment for which a gravity grease interceptor is required shall have an interceptor which shall serve only that establishment unless otherwise approved by the Authority Having Jurisdiction.

1014.3.4.4 Each gravity grease interceptor shall be located so as to be readily accessible to the equipment required for maintenance.

1014.3.5 Construction Requirements.

1014.3.5.1 Purpose. Gravity grease interceptors shall be designed to remove grease from effluent and shall be sized in accordance with this section. Gravity grease interceptors shall also be designed to retain grease until accumulations can be removed by pumping the interceptor. It is recommended that a sample box be located at the outlet end of all gravity grease interceptors so that the Authority Having Jurisdiction can periodically sample effluent quality.

1014.3.6 Sizing Criteria.

1014.3.6.1 Sizing. The volume of the interceptor shall be determined by using Table 10-3. If drainage fixture units (DFUs) are not known, the interceptor shall be sized based on the maximum DFUs allowed for the pipe size connected to the inlet of the interceptor. Refer to Table 7-5, Drainage Piping, Horizontal.

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.

1015.0 FOG (Fats, Oils, and Greases) Disposal System.

1015.1 Purpose. The purpose of this section is to provide the necessary criteria for the sizing, application, and installation of FOG disposal systems designed

nated as a pretreatment or discharge water quality compliance strategy.

1015.2 Scope. FOG disposal systems shall be considered engineered systems and shall comply with the requirements of Section 301.4 of this code.

1015.3 Components, Materials, and Equipment. FOG disposal systems, including all components, materials, and equipment necessary for the proper function of the system, shall comply with Sections 301.1.3 or 301.2 of this code.

1015.4 Sizing Application and Installation. FOG disposal systems shall be engineered, sized, and installed in accordance with the manufacturers' specifications and as specified in ASME A112.14.6, as listed in Chapter 14, Table 14-1 of this code.

1015.5 Performance. FOG disposal systems shall be tested and certified as listed in Chapter 14, Table 14-1 of this code, and other national consensus standards applicable to FOG disposal systems as discharging a maximum of 100 mg/L FOG.

Gravity Grease Interceptor Sizing Example:

Given: A restaurant with the following fixtures and equipment.

One food preparation sink; three floor drains - one in the food prep area, one in the grill area, and one receiving the indirect waste from the ice machine and a mop sink.

Kitchen Drain Line DFU Count (from Table 7-3):

3 floor drains @ 2 DFUs each =	6 DFUs
Mop sink @ 3 DFUs each =	3 DFUs
Food prep sink @ 3 DFUs each =	3 DFUs
Total	12 DFUs

Using Table 10-3, the grease interceptor will be sized at 750 gallons.

1016.0 Sand Interceptors.

1016.1 Where Required.

1016.1.1 Whenever the discharge of a fixture or drain contain solids or semi-solids heavier than water that would be harmful to a drainage system or cause a stoppage within the system, the discharge shall be through a sand interceptor. Multiple floor drains shall be permitted to discharge into one sand interceptor.

1016.1.2 Sand interceptors are required whenever the Authority Having Jurisdiction deems it advisable to have a sand interceptor to protect the drainage system.

1016.2 Construction and Size. Sand interceptors shall be built of brick or concrete, prefabricated coated steel, or other watertight material. The interceptor shall have an interior baffle for full separation of the interceptor into two (2) sections. The outlet pipe shall be the same size as the inlet pipe of the sand interceptor, the minimum being three (3) inches (80 mm), and the baffle shall have two (2) openings of the same diameter as the outlet pipe and at the same invert as the outlet pipe. These openings shall be staggered so that there cannot be a straight line flow between any inlet pipe and the outlet pipe. The invert of the inlet pipe shall be no lower than the invert of the outlet pipe.

The sand interceptor shall have a minimum dimension of two (2) feet square (0.19 m²) for the net free opening of the inlet section and a minimum depth under the invert of the outlet pipe of two (2) feet (610 mm).

For each five (5) gallons (18.9 L) per minute flow or fraction thereof over twenty (20) gallons (75.7 L) per minute, the area of the sand interceptor inlet section is to be increased by one (1) square foot (0.09 m²). The outlet section shall at all times have a minimum area of fifty (50) percent of the inlet section.

The outlet section shall be covered by a solid removable cover, set flush with the finished floor, and the inlet section shall have an open grating, set flush with the finished floor and suitable for the traffic in the area in which it is located.

1016.3 Separate Use. Sand and similar interceptors for every solid shall be so designed and located as to be readily accessible for cleaning, shall have a water seal of not less than six (6) inches (152 mm), and shall be vented.

1017.0 Oil and Flammable Liquid Interceptors.

1017.1 Interceptors Required. All repair garages and gasoline stations with grease racks or grease pits, and all 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 all necessary floor drains. The separation or vapor compartment shall be independently vented to the outer air. If two (2) 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 six (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 two (2) inches (50 mm), and, when vented through a side-

wall, the vent shall be not less than ten (10) feet (3,048 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. All oil and flammable interceptors shall be provided with gastight cleanout covers that shall be readily accessible. The waste line shall be not less than three (3) inches (80 mm) in diameter with a full-size cleanout to grade. When an interceptor is provided with an overflow, it shall be provided with an overflow line (not less than two (2) inches (50 mm) in diameter) to an approved waste oil tank having a minimum capacity of five-hundred fifty (550) gallons (2,082 L) and meeting the requirements of the Authority Having Jurisdiction. The waste oil from the separator 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 two (2) inch (50 mm) minimum pump-out connection at grade and a one and one-half (1-1/2) inch (40 mm) minimum vent to atmosphere at an approved location not less than ten (10) feet (3,048 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/m). 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 two (2) feet (610 mm) below the invert of the discharge drain. The outlet opening shall have not less than an eighteen (18) inch (457 mm) water seal and shall have a minimum capacity as follows: Where not more than three (3) motor vehicles are serviced and/or stored, interceptors shall have a minimum capacity of six (6) cubic feet (0.17 m³), and one (1) cubic foot (0.03 m³) of capacity shall be added for each vehicle up to ten (10) vehicles. Above ten (10) vehicles, the Authority Having Jurisdiction shall determine the size of the interceptor required. Where vehicles are serviced only and not stored, interceptor capacity shall be based on a net capacity of one (1) cubic foot (0.03 m³) for each one-hundred (100) square feet (9.29 m²) of surface to be drained into the interceptor, with a minimum of six (6) cubic feet (0.17 m³).

MASTER EDITS

05/13/14

REVISOR

SS/RC

RD4139

1.1 **Department of Labor and Industry**

1.2 **Proposed Amendment to Rules Governing the Plumbing Code and Adopting the**
1.3 **2012 Uniform Plumbing Code, with Amendments**

= new line
^ = insert
strikethrough = delete

1.4 **4714.0050 TITLE; INCORPORATION BY REFERENCE.**

1.5 Chapters 2 to 11, 14, and 17 of the 2012 edition of the Uniform Plumbing Code
1.6 (UPC) as promulgated by the International Association of Plumbing and Mechanical
1.7 Offices (IAPMO), Ontario, California, and UPC appendices A, B, and I, except for
1.8 IS 12-2006, IS 13-2006, IS 26-2006, SIS 1-2003, and SIS 2-2013 of appendix I, are
1.9 incorporated by reference and made part of the Minnesota Plumbing Code except as
1.10 qualified by the applicable provisions in chapter 1300, and as amended in this chapter.
1.11 The UPC is not subject to frequent change and a copy of the UPC, with amendments for
1.12 use in Minnesota, is available in the office of the commissioner of labor and industry.
1.13 Portions of this chapter reproduce text and tables from the UPC. The UPC is copyright
1.14 2012 by the IAPMO. All rights reserved.

1.15 **4714.0100 BASIC PLUMBING PRINCIPLES.**

1.16 This code is founded upon certain basic principles of environmental sanitation
1.17 and safety through properly designed, acceptably installed, and adequately maintained
1.18 plumbing systems. Some of the details of plumbing construction may vary, but the basic
1.19 sanitary and safety principles desirable and necessary to protect the health of the people
1.20 are the same everywhere. As interpretations may be required, and as unforeseen situations
1.21 arise that are not specifically covered in this code, the 23 principles in items A to W
1.22 shall be used to define the intent.

1.23 A. All premises intended for human habitation, occupancy, or use shall be
1.24 provided with a potable water supply that meets the requirements of the commissioner of
1.25 health. The water supply shall not be connected with unsafe water sources nor shall it
1.26 be subject to the hazards of backflow or back-siphonage.

2.1 B. Proper protection shall be provided to prevent contamination of food, water,
2.2 sterile goods, and similar materials by backflow of sewage. When necessary, the fixtures,
2.3 devices, or appliances shall be connected indirectly with the building drainage system.

2.4 C. Each family dwelling unit shall have at least one water closet, one lavatory,
2.5 one kitchen-type sink, and one bathtub or shower to meet the basic requirements of
2.6 sanitation and personal hygiene. All other structures for habitation shall be equipped
2.7 with sufficient sanitary facilities.

2.8 D. The building sewer in every building with installed plumbing fixtures and
2.9 intended for human habitation, occupancy, or use when located on premises where the
2.10 authority having jurisdiction has determined that a public sewer is available shall be
2.11 connected to the public sewer.

2.12 E. The building drainage system shall be designed to provide adequate
2.13 circulation of air in all pipes with no danger of siphonage, aspiration, or forcing of trap
2.14 seals under conditions of ordinary use.

2.15 F. The drainage system shall be designed, constructed, and maintained to conduct
2.16 the waste water with velocities that prevent fouling, deposition of solids, and clogging.

2.17 G. The drainage system shall be provided with an adequate number of cleanouts
2.18 so arranged that in case of stoppage the pipes may be readily cleaned.

2.19 H. Where a building drainage system may be subjected to backflow of sewage,
2.20 suitable provision shall be made to prevent overflow in the building.

2.21 I. Each vent terminal shall extend to the outer air and be so installed as to
2.22 minimize the possibilities of clogging and the return of foul air to the building.

2.23 J. No substance that will clog or accentuate clogging of pipes, produce
2.24 explosive mixtures, destroy the pipes or their joints, or interfere unduly with the sewage
2.25 disposal process shall be allowed to enter the drainage system.

3.1 K. The piping of the plumbing system shall be of durable material free from
3.2 defective construction and designed and constructed to give satisfactory service for its
3.3 reasonable expected life.

3.4 L. The plumbing system shall be subjected to adequate tests and to inspections
3.5 in a manner that will disclose all leaks and defects in the work or the material.

3.6 M. Plumbing systems shall be maintained in a safe and serviceable condition
3.7 from the standpoint of both mechanics and health.

3.8 N. Plumbing shall be installed with due regard to preservation of the strength
3.9 of structural members and prevention of damage to the walls and other surfaces through
3.10 fixture usage.

3.11 O. Plumbing fixtures shall be made of durable, smooth, nonabsorbent, and
3.12 corrosion-resistant material and be free from concealed fouling surfaces.

3.13 P. Plumbing fixtures, devices, and appurtenances shall be supplied with water
3.14 in sufficient volume and at pressures adequate to enable them to function properly and
3.15 without undue noise under normal conditions of use.

3.16 Q. Plumbing fixtures shall be designed and adjusted to use the minimum
3.17 quantity of water consistent with proper performance and cleaning. Hot water shall be
3.18 supplied to all plumbing fixtures which normally need or require hot water for their
3.19 proper use and function.

3.20 R. All plumbing fixtures shall be installed with regard to spacing as to be
3.21 accessible for their intended use and cleansing.

3.22 S. Each fixture shall be provided with a separate, accessible, self-scouring,
3.23 reliable trap placed as near to the fixture as possible.

3.24 T. No water closet or similar fixture shall be located in a room or compartment
3.25 that is not properly lighted and ventilated.

4.1 U. If water closets or other plumbing fixtures are installed in a building where
4.2 there is no public sewer available as determined by the authority having jurisdiction,
4.3 suitable provisions must be made for treatment of the building sewage by methods that
4.4 meet the requirements of rules administered by the Pollution Control Agency.

4.5 V. Devices for heating and storing water shall be designed and installed to
4.6 prevent all dangers from explosion and overheating.

4.7 W. Sewage or other waste shall not be discharged into surface or subsurface
4.8 water unless it first has been subjected to an acceptable form of treatment approved by the
4.9 Pollution Control Agency.

4.10 **4714.0101 CONFORMANCE WITH CODE.**

4.11 Subpart 1. **Scope.** As provided in Minnesota Statutes, sections 326B.43 and
4.12 342B.52, this code applies to all new plumbing installations performed anywhere in the
4.13 state, including additions, extensions, alterations, and replacements.

4.14 Subp. 2. **New buildings.** All plumbing materials and plumbing systems or parts
4.15 thereof must be installed to meet the minimum provisions of this code.

4.16 Subp. 3. **Existing buildings.** In existing buildings and premises in which plumbing
4.17 systems, drainage systems, or other work regulated by this code are to be added, altered,
4.18 renovated, or replaced, the new materials and work must meet the provisions of this code.
4.19 If the authority having jurisdiction finds that the full performance of bringing the work into
4.20 compliance with all requirements of this code would result in exceptional or undue hardship
4.21 by reason of excessive structural or mechanical difficulty or impracticability, a deviation
4.22 may be granted by the authority having jurisdiction only to the extent the deviation can be
4.23 granted without endangering the health and safety of the occupants and the public.

4.24 Subp. 4. **Changes in building occupancy.** A plumbing system that is a part of a
4.25 building or structure undergoing a change in use or occupancy, as defined in the building

5.1 code, shall be in accordance with the requirements of this code that are applicable to
5.2 the new use or occupancy.

5.3 Subp. 5. **Moved buildings.** Plumbing systems that are part of buildings or structures
5.4 moved into this jurisdiction shall be in accordance with this code for new installations.
5.5 Parts of the plumbing systems of a building or part thereof that is moved from one
5.6 foundation to another, or from one location to another, shall be completely tested as new
5.7 work, except that walls or floors need not be removed during such tests where other
5.8 equivalent means of inspection acceptable to the authority having jurisdiction are provided.

5.9 Subp. 6. **Health and safety.** No provision of this code shall be deemed to require
5.10 a change in a portion of a plumbing or drainage system or other work regulated by this
5.11 code in or on an existing building or lot where the work was installed and is maintained
5.12 in accordance with rule in effect before the effective date of this code, except where
5.13 the plumbing or drainage system or other work regulated by this code is determined by
5.14 the authority having jurisdiction to be dangerous, unsafe, insanitary or a nuisance or a
5.15 hazard to life, health, or property then the owner or owner's agent shall be responsible for
5.16 bringing the existing plumbing installation within the provisions of this code.

5.17 Subp. 7. **Commissioner's authority.** The commissioner retains the ultimate
5.18 authority to enforce this code and Minnesota Statutes, sections 326B.41 to 326B.59,
5.19 regardless of whether the administrative authority is the commissioner or the governing
5.20 body of a governmental subdivision.

5.21 **4714.0203 TERMS DEFINED BEGINNING WITH A.**

5.22 Subpart 1. **Added definitions.** UPC section 203.0 is modified by adding the
5.23 following definition:

5.24 **Administrative Authority** - Means the commissioner.

5.25 **Exception:** When a governmental subdivision adopts and maintains a comprehensive
5.26 plumbing enforcement program that is conducted by personnel who are knowledgeable

6.1 about plumbing installation requirements, and includes enforcement of all code
 6.2 provisions including materials, methods, inspection, and testing, the administrative
 6.3 authority shall be the governing body of the adopting unit of government or a duly
 6.4 designated representative of the governing body who is either an employee of the
 6.5 governing body or a person working under contract with the governing body.

6.6 *Approved - Means approval by the Administrative Authority, pursuant to the Minnesota Plumbing Code, by reason of inspection, investigation, or testing; accepted principles; computer simulations; research reports; or testing performed by a nationally recognized testing laboratory.*
 6.6 Subp. 2. Amended definitions. UPC section 203.0 is modified by amending the
 6.7 following definition:
 6.8 **Authority Having Jurisdiction** - Unless otherwise specified in this code, the term
 6.9 Authority Having Jurisdiction has the same meaning as Administrative Authority.

6.10 **4714.0205 TERMS DEFINED BEGINNING WITH C.**

6.11 Subpart 1. Amended definitions. UPC section 205.0 is modified by amending the
 6.12 following definitions:

6.13 **Certified Backflow Assembly Tester** - Has the same meaning as backflow prevention
 6.14 tester defined in Minnesota Statutes, section 326B.42, subdivision 1c.

6.15 **Clear Water Waste** - Uncontaminated water discharges, subsoil discharges, and similar
 6.16 discharges.

6.17 **Code** - For purposes of this chapter, "this code" or "the code" means the Minnesota
 6.18 Plumbing Code, Minnesota Rules, chapter 4714.

6.19 Subp. 2. Added definitions. UPC section 205.0 is modified by adding the following
 6.20 definition:

6.21 **Commissioner** - Means the commissioner of labor and industry or a duly designated
 6.22 representative of the commissioner who is either an employee of the Department of Labor
 6.23 and Industry or a person working under contract with the department.

6.24 **4714.0206 TERMS DEFINED BEGINNING WITH D.**

6.25 UPC section 206.0 is modified by amending the following definition:

7.1 **Drainage System** - Includes all the piping within public or private premises that conveys
7.2 sewage, rainwater, or other liquid wastes to a legal point of disposal, but does not include
7.3 the mains of a public sewer system or a public sewage treatment or disposal plant.

7.4 **4714.0210 TERMS DEFINED BEGINNING WITH H.**

7.5 Subpart 1. **Amended definition.** UPC section 210.0 is modified by amending the
7.6 following definition:

7.7 **Hydromechanical Grease Interceptor** - A plumbing appurtenance or appliance that is
7.8 installed in a sanitary drainage system to intercept nonpetroleum fats, oil, and grease
7.9 (FOG) from a wastewater discharge and is identified by flow rate, and separation and
7.10 retention efficiency. The design incorporates air entrainment, hydromechanical separation,
7.11 interior baffling, or barriers in combination or separately, and one of the following:

7.12 A - External flow control, with air intake (vent), directly connected.

7.13 B - External flow control, without air intake (vent), directly connected.

7.14 C - Without external flow control, directly connected.

7.15 These interceptors comply with the requirements of Table 1014.2.1. Hydromechanical
7.16 grease interceptors are generally installed inside.

7.17 Subp. 2. **Added definitions.** UPC section 210.0 is modified by adding the following
7.18 definition:

7.19 **Health Authority** - Means the state health department or local public health agency that
7.20 has authority established under law to enforce rules governing drinking water supply.

7.21 **4714.0218 TERMS DEFINED BEGINNING WITH P.**

7.22 UPC section 218.0 is modified by amending the following definitions:

7.23 **Plumbing System** - Includes all potable water, building supply, and distribution pipes;
7.24 all plumbing fixtures and traps; all drainage and vent pipes; and all building drains and
7.25 building sewers, including their respective joints and connections, devices, receptors, and
7.26 appurtenances within the property lines of the premises and shall include potable water

8.1 pipng, potable water treating or using equipment, and nonpotable water piping serving
8.2 plumbing fixtures.

8.3 **Potable Water** - Water that is satisfactory for drinking, culinary, and domestic purposes
8.4 and that meets the requirements of the Health Authority.

8.5 **Private Sewage Disposal System** - A subsurface sewage treatment system designed for
8.6 use apart from a public sewer as regulated under the rules administered by the Pollution
8.7 Control Agency.

8.8 **4714.0221 TERMS DEFINED BEGINNING WITH S.**

8.9 UPC section 221.0 is modified by amending the following definition:

8.10 **Single-Family Dwelling** - Has the meaning of dwelling, single-family, in Minnesota
8.11 Rules, part 1309.0202, subpart 1.

8.12 **4714.0301 SECTION 301.0 MATERIALS - STANDARDS AND ALTERNATIVES.**

8.13 Subpart 1. Section 301.1. UPC section 301.1 is amended to read as follows:

8.14 **301.1 Minimum Standards.** Pipe, pipe fittings, traps, fixtures, material, and devices used

8.15 in a plumbing system shall be listed or labeled (third-party certified) by a listing agency

8.16 (^{301.1 a.} accredited conformity assessment body) and shall comply with the approved applicable

8.17 recognized standards referenced in this code, and shall be free from defects. Plastic pipe

8.18 and the fittings used for plastic pipe shall meet the requirements of NSF 14. Unless

8.19 otherwise provided for in this code, materials, fixtures, or devices used or entering into the

8.20 construction of plumbing systems, or parts thereof, shall be submitted to the Authority

8.21 Having Jurisdiction for approval.

8.22 **301.1.1 Marking.** Each length of pipe and each pipe fitting, trap, fixture, material,

8.23 and device used in a plumbing system shall have cast, stamped, or indelibly marked

8.24 on it the manufacturer's mark or name, which shall readily identify the manufacturer

8.25 to the end user of the product. Where required by the approved standard that applies,

8.26 the product shall be marked with the weight and the quality of the product. Materials

9.1 and devices used or entering into the construction of plumbing and drainage systems,
9.2 or parts thereof, shall be marked and identified in a manner satisfactory to the
9.3 Authority Having Jurisdiction. The marking shall be done by the manufacturer. Field
9.4 markings shall not be acceptable.

9.5 **301.1.2 Standards.** Standards listed or referred to in this chapter or other chapters
9.6 cover materials that will conform to the requirements of this code, where used in
9.7 accordance with the limitations imposed in this or other chapters thereof and their
9.8 listing. Where a standard covers materials of various grades, weights, quality, or
9.9 configurations, the portion of the listed standard that is applicable shall be used.
9.10 Design and materials for special conditions or materials not provided for herein shall
9.11 be permitted to be used only by special permission of the Authority Having Jurisdiction
9.12 after the Authority Having Jurisdiction has been satisfied as to their adequacy. A list
9.13 of accepted plumbing material standards is referenced in Table 1401.1.

9.14 Subp. 2. **Section 301.2.** UPC section 301.2 is amended to read as follows:

9.15 **301.2 Alternate Materials and Methods of Construction Equivalency.** Nothing in
9.16 this code is intended to prevent the use of systems, methods, or devices of equivalent or
9.17 superior quality, strength, fire resistance, effectiveness, durability, and safety over those
9.18 prescribed by this code. Prior to installation, technical documentation shall be submitted
9.19 to the Authority Having Jurisdiction to demonstrate equivalency. Unless prohibited by
9.20 this code or by law, the Authority Having Jurisdiction shall have the authority to approve
9.21 or disapprove the system, method, or device for the intended purpose.

9.22 However, the exercise of this discretionary approval by the Authority Having
9.23 Jurisdiction shall have no effect beyond the jurisdictional boundaries of the Authority
9.24 Having Jurisdiction. An alternate material or method of construction so approved shall not
9.25 be considered as in accordance with the requirements, intent, or both of this Code for a
9.26 purpose other than that granted by the Authority Having Jurisdiction where the submitted
9.27 data does not prove equivalency.

10.1 Subp. 3. Section 301.4.6. UPC section 301.4.6 is amended to read as follows:
10.2 **301.4.6 Inspection and Testing.** The alternative engineered design shall be tested
10.3 and inspected in accordance with the submitted testing and inspection plan and the
10.4 requirements of this code. Prior to the final plumbing inspection, the design engineer
10.5 must provide written certification to the administrative authority that the system
10.6 has been visually inspected by the design professional engineer or a designee, and
10.7 the installation has been properly implemented according to the certified plans,
10.8 calculations, and specifications.

10.9 **4714.0307 LOCATION.**

10.10 UPC section 307.1 is amended to read as follows:

10.11 **307.1 System.** Except as otherwise provided in this code, no plumbing system, drainage
10.12 system, building sewer, or part thereof shall be located in a lot other than the lot that is the
10.13 site of the building, structure, or premises served by such facilities.

10.14 **4714.0311 INDEPENDENT SYSTEMS.**

10.15 Subpart 1. Section 311.0. UPC section 311.0 title is amended to read as follows:

10.16 **311.0 Use of Public Sewer and Water Systems Required.**

10.17 Subp. 2. Section 311.1. UPC section 311.1 is amended to read as follows:

10.18 **311.1 General.** If a public sewer is available in a street or alley to a building or premises
10.19 and the connection is feasible, liquid waste from any plumbing system in that building
10.20 must be discharged into the public sewer unless otherwise prohibited by this code or a
10.21 local ordinance. If a public water supply is accessible, the water distribution system must
10.22 be connected to it unless otherwise permitted by the Authority Having Jurisdiction. A
10.23 private water well taken out of service because of a connection to a public water supply
10.24 shall be maintained pursuant to Minnesota Rules, chapter 4725, Wells and Borings.

11.1 Every building must have its own independent water and sewer connection except that
 11.2 a group of buildings may be connected to one or more sewer manholes on the premises
 11.3 that are constructed to standards set by the Authority Having Jurisdiction.

11.4 **4714.0312 PROTECTION OF PIPING, MATERIALS, AND STRUCTURES.**

11.5 Subpart 1. Section 312.7. UPC section 312.7 is amended to read as follows:

11.6 **312.7 Fire-Resistant Construction.** Piping penetrations of fire-resistance-rated walls,
 11.7 partitions, floors, floor/ceiling assemblies, roof/ceiling assemblies, or shaft enclosures
 11.8 shall be protected in accordance with the ^Bbuilding ^Ccode.

^A
State

11.9 Subp. 2. Section 312.9. UPC section 312.9 is amended to read as follows:

11.10 **312.9 Steel Nail Plates.** Plastic and copper piping penetrating framing members to within
 11.11 1 inch (25.4 mm) of the exposed framing shall be protected by steel nail plates not less
 11.12 than No. 18 gauge (0.0478 inches) (1.2 mm) in thickness. The steel nail plate shall
 11.13 extend along the framing member not less than 1 1/2 inches (38 mm) beyond the outside
 11.14 diameter of the pipe or tubing.

11.15 **Exception:** See Minnesota Rules, chapter 1346, Minnesota Mechanical and Fuel
 11.16 Gas Codes.

11.17 **4714.0313 HANGERS AND SUPPORTS.**

11.18 UPC section 313.7 is deleted in its entirety.

11.19 **4714.0314 TRENCHING, EXCAVATION, AND BACKFILL.**

11.20 UPC sections 314.0 to 314.4 are deleted in their entirety.

11.21 **4714.0315 JOINTS AND CONNECTIONS.**

11.22 UPC section 315.1 is amended to read as follows:

11.23 **315.1 Unions.** Approved unions shall be permitted to be used in drainage piping where
 11.24 accessibly located in the trap seal or between a fixture and its trap in the vent system,
 11.25 except underground or in wet vents, at a point in the water supply system.

12.1 **4714.0317 FOOD-HANDLING ESTABLISHMENTS.**

12.2 UPC section 317.1 is amended to read as follows:

12.3 **317.1 General.** Soil or drain pipes installed over areas where food or drink will be stored,
12.4 prepared, or displayed shall be installed with the minimum number of joints necessary and
12.5 connected to the nearest adequately sized vertical stack with the following provisions:

12.6 (1) Openings through floors over such areas shall be sealed watertight to the floor
12.7 construction.

12.8 (2) Floor and shower drains installed above such areas shall be equipped with integral
12.9 seepage pans.

12.10 (3) Cleanouts shall be extended through the floor construction above.

12.11 (4) Piping subject to operation at temperatures that will form condensation on the exterior
12.12 of the pipe shall be thermally insulated.

12.13 (5) Where pipes are installed in ceilings above such areas, the ceiling shall be of the
12.14 removable type, or shall be provided with access panels in order to form a ready access
12.15 for inspection of piping.

12.16 **4714.0319 MEDICAL GAS AND VACUUM SYSTEMS.**

12.17 UPC sections 319.0 to 319.1 are deleted in their entirety.

12.18 **4714.0403 WATER-CONSERVING FIXTURES AND FITTINGS.**

12.19 UPC section 403.3 is amended to read as follows:

12.20 **403.3 Urinals.** Urinals shall have an average water consumption not to exceed 1 gallon
12.21 (4 L) of water per flush.

12.22 **403.3.1 Nonwater urinals.** Nonwater urinals shall be listed and comply with the
12.23 applicable standards referenced in Table 1401.1. Nonwater urinals shall have a barrier
12.24 liquid sealant to maintain a trap seal. Nonwater urinals shall permit the uninhibited
12.25 flow of waste through the urinal to the sanitary drainage system. Nonwater urinals
12.26 shall be cleaned and maintained in accordance with the manufacturer's instructions

13.1 after installation. Where a nonwater urinal is installed, a water-supplied fixture shall
13.2 be installed upstream of the nonwater urinal at the end of that same drainage branch.

13.3 **4714.0406 PROHIBITED FIXTURES.**

13.4 UPC section 406.3 is deleted in its entirety.

13.5 **4714.0409 BATHTUBS AND WHIRLPOOL BATHTUBS.**

13.6 UPC section 409.1 is amended to read as follows:

13.7 **409.1 Application.** Bathtubs and whirlpool bathtubs shall comply with the applicable
13.8 standards referenced in Table 1401.1. Pressure sealed doors within a bathtubs and whirlpool
13.9 bathtub enclosure shall comply with the applicable standards referenced in Table 1401.1.
13.10 Whirlpool pedicure tubs must comply with general requirements and water retention
13.11 sections of ASME A112.9.7 or IAPMO IGC 155, Pipeless Whirlpool Bathtub Appliances.

13.12 **4714.0415 DRINKING FOUNTAINS.**

13.13 UPC section 415.2 is amended to read as follows:

13.14 **415.2 Public Use Fountains.** Installation of a combined cold water faucet and drinking
13.15 fountain is prohibited for public use. If a drinking fountain is provided at a public use
13.16 sink, it must have at least an 18-inch separation from any other faucet spout.

13.17 **4714.0418 FLOOR DRAINS.**

13.18 Subpart 1. Section 418.4. UPC section 418.4 is amended to read as follows:

13.19 **418.4 Food Storage Areas.** Where drains are provided in storerooms, walk-in freezers,
13.20 walk-in coolers, refrigerated equipment, or other locations where food is stored, the drains
13.21 shall have indirect waste piping. Separate waste pipes shall be run from each food storage
13.22 area, each with an indirect connection to the building sanitary drainage system. Traps shall
13.23 be provided in accordance with Section 801.2.2 and shall be vented.

13.24 Indirect drains shall be permitted to be located in freezers or other spaces where
13.25 freezing temperatures are maintained, provided that traps, where supplied, shall be located

14.1 where the seal will not freeze. Otherwise, the floor of the freezer shall be sloped to a floor
14.2 drain located outside of the storage compartment.

14.3 Subp. 2. **Section 418.** UPC section 418 is amended by adding the following
14.4 subsections.

14.5 **418.6 Elevator Pit Drain.** An elevator pit drain must discharge to the sanitary sewer
14.6 using an indirect connection that precludes the possibility of sewage backup into the pit. If
14.7 a sump is used, it must be outside the pit with a dry pan drain flowing to it.

14.8 **418.7 Garage and Parking Area Floor Drains.** Floor area drains in open parking areas,
14.9 including open areas of parking ramps, must discharge to the storm sewer or to a place of
14.10 disposal satisfactory to the sewer authority. Floor drains in parking areas that are enclosed,
14.11 and floor drains in areas open or enclosed that are used for maintenance or as vehicle wash
14.12 bays, must discharge to the sanitary sewer if a municipal sewer is available. An oil and
14.13 flammable liquid interceptor must be provided if required by Section 1017.

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

14.16 **4714.0420 SINKS.**

14.17 UPC section 420.3 is amended to read as follows:

14.18 **420.3 Waste Outlet.** Kitchen and laundry sinks shall have a waste outlet and fixture
14.19 tailpiece not less than 1-1/2 inches (40 mm) in diameter, except commercial pot and scullery
14.20 sinks must be provided with waste outlets not less than 2 inches in diameter. Service sinks
14.21 shall have a waste outlet and fixture tailpiece not less than 2 inches (50 mm) in diameter.
14.22 Fixture tailpieces shall be constructed from the materials specified in Section 701.1 for
14.23 drainage piping, provided, however, that the connections where exposed or accessible
14.24 shall be permitted to be of seamless drawn brass not less than No. 20 B & S Gauge (0.032
14.25 inches) (0.81 mm). Waste outlets shall be provided with and approved strainer.

15.1 **4714.0421 FIXTURES AND FIXTURE FITTINGS FOR PERSONS WITH**
 15.2 **DISABILITIES.**

15.3 UPC section 421.2 is amended to read as follows:

15.4 **421.2 Limitation of Hot Water Temperature for Public Lavatories.** Hot water
 15.5 delivered from public-use lavatories shall be limited to a maximum temperature of 110°
 15.6 F (43° C) by a device that is in accordance with ASSE 1070 or CSA B125.3. The water
 15.7 heater thermostat shall not be considered a control for meeting this provision.

15.8 **4714.0422 MINIMUM NUMBER OF REQUIRED FIXTURES.**

15.9 Subpart 1. **Section 422.1.** UPC section 422.1 is amended to read as follows:

15.10 **422.1 Required Minimum Number of Fixtures.** For all premises subject to ~~this~~ chapter
 15.11 plumbing fixtures shall be provided for the type of building occupancy and in the 4714
 15.12 minimum number listed in chapter 1305, Minnesota Building Code.

15.13 Subp. 2. **Sections 422.1.1 to 422.5.** UPC sections 422.1.1 to 422.5, including tables,
 15.14 are deleted in their entirety.

15.15 Subp. 3. **Table 422.1.** UPC Table 422.1 is deleted in its entirety.

15.16 **4714.0501 GENERAL.**

15.17 UPC section 501.1 is amended to read as follows:

15.18 **501.1 Applicability.** The regulations of this chapter shall govern the construction,
 15.19 location, and installation of fuel-burning and other water heaters heating potable water. as amended in this code

15.20 The minimum capacity for storage water heaters shall be in accordance with the first hour
 15.21 rating listed in Table 501.1. Design, construction, and workmanship shall be in accordance
 15.22 with accepted engineering practices, manufacturer's instructions, and applicable standards
 15.23 and shall be of such character as to secure the results sought to be obtained by this code.

15.24 No water heater shall be hereinafter installed that does not comply with the type and
 15.25 model of each size thereof approved by the Authority Having Jurisdiction.

16.1 **4714.0503 INSPECTION.**

16.2 UPC sections 503.0 to 503.2 are deleted in their entirety.

16.3 **4714.0504 WATER HEATER REQUIREMENTS.**

16.4 Subpart 1. Sections 504.1 to 504.2. UPC sections 504.1 to 504.2 are deleted in
16.5 their entirety.

16.6 Subp. 2. Section 504.6. UPC section 504.6 is amended to read as follows:

16.7 **504.6 Temperature, Pressure, and Vacuum Relief Devices.** The installation of
16.8 temperature, pressure, and vacuum relief devices, or combinations thereof, shall be
16.9 installed in accordance with the terms of their listings and the manufacturer's installation
16.10 instructions. A shutoff valve shall not be placed between the relief valve and the water
16.11 heater or on discharge pipes between the valves and the atmosphere. The hourly British
16.12 thermal units (Btu) (kW·h) discharge capacity or the rated steam relief capacity of the
16.13 device shall be not less than the input rating of the water heater. [NFPA 54:10.28.5]

16.14 **4714.0505 OIL-BURNING AND OTHER WATER HEATERS.**

16.15 UPC section 505.4.1 is deleted in its entirety.

16.16 **4714.0506 AIR FOR COMBUSTION AND VENTILATION.**

16.17 UPC sections 506.0 to 506.9 are deleted in their entirety.

16.18 **4714.0507 OTHER WATER HEATER INSTALLATION REQUIREMENTS.**

16.19 Subpart 1. Sections 507.6 to 507.11 and 507.14 to 507.23. UPC sections 507.6 to
16.20 507.11 and 507.14 to 507.23 are deleted in their entirety.

16.21 Subp. 2. Section 507.5. UPC section 507.5 is amended to read as follows:

16.22 **507.5 Relief Valve Discharge.** Discharge from a relief valve into a water heater pan shall
16.23 be prohibited. Discharge relief valve shall terminate within 18 inches of:

16.24 (1) the floor; or

16.25 (2) a safe place of disposal.

17.1 **4714.0508 APPLIANCES ON ROOFS.**17.2 UPC sections 508.0 to 508.4 are deleted in their entirety.17.3 **4714.0509 VENTING OF APPLIANCES.**17.4 UPC sections 509.0 to 509.14, including all tables and figures, are deleted in their
17.5 entirety.17.6 **4714.0510 SIZING OF CATEGORY I VENTING SYSTEMS.**17.7 UPC sections 510.0 to 510.2, including all tables and figures, are deleted in their
17.8 entirety.17.9 **4714.0511 DIRECT-VENT APPLIANCES.**17.10 UPC sections 511.0 to 511.1 are deleted in their entirety.17.11 **4714.0601 HOT AND COLD WATER REQUIRED.**17.12 UPC section 601 is amended to read as follows:17.13 **601.0 Hot and Cold Water Required.**17.14 ~~601.1 General. Except where not deemed necessary for safety or sanitation by the~~17.15 ~~Authority Having Jurisdiction, each plumbing fixture shall be provided with an adequate~~17.16 supply of potable running water piped to it in an approved manner, so arranged as to17.17 flush and keep the fixture in a clean and sanitary condition without danger of backflow17.18 or cross-connection. Water closets and urinals shall be flushed by means of an approved17.19 flush tank or flushometer valve.17.20 **Exception:** Listed fixtures that do not require water for their operation and are not
17.21 connected to the water supply.17.22 601.1 In occupancies where plumbing fixtures are installed for private use, hot water shall be
17.23 required for bathing, washing, laundry, cooking purposes, dishwashing, or maintenance.17.24 In occupancies where plumbing fixtures are installed for public use, hot water shall be17.25 required for bathing and washing purposes. This requirement shall not supersede the

18.1 requirements for individual temperature control limitations for public lavatories, bidets,
18.2 bathtubs, whirlpool bathtubs, and shower control valves.

18.3 1601.1.2 Hot water supply systems in four-story buildings or higher, or buildings where the
18.4 developed length of hot water piping from the source of hot water supply to the farthest
18.5 fixture supplied exceeds 100 feet, shall be of the return circulation type.

18.6 **4714.0602 UNLAWFUL CONNECTIONS.**

18.7 Subpart 1. Section 602.2. UPC section 602.2 is amended to read as follows: *move*

18.8 **602.2 Cross-Contamination.** *n* No person shall make a connection or allow one to exist
18.9 between pipes or conduits carrying domestic water supplied by a public or private building
18.10 supply system, and pipes, conduits, or fixtures containing or carrying water from any other
18.11 source or containing or carrying water that has been used for any purpose whatsoever,
18.12 or piping carrying chemicals, liquids, gases, or substances whatsoever, unless there is
18.13 provided a backflow prevention device approved for the potential hazard and maintained
18.14 in accordance with this code. Each point of use shall be separately protected where
18.15 potential cross-contamination of individual units exists. Water used for cooling or heating
18.16 of equipment or other purposes shall not be returned to the potable water system. Such
18.17 water shall be discharged into the drainage system through an air-gapped indirect waste or
18.18 other approved method of disposal.

18.19 Subp. 2. Section 602.4. UPC section 602.4 is amended to read as follows:

18.20 **602.4 Approval by Authority.** No water piping supplied by a private water supply system
18.21 shall be connected to any other source of supply without the approval of the Authority
18.22 Having Jurisdiction.

18.23 **4714.0603 CROSS-CONNECTION CONTROL.**

18.24 Subpart 1. Section 603.2. UPC section 603.2 is amended to read as follows:

18.25 **603.2 Approval of Devices or Assemblies.** Before a device or an assembly is installed
18.26 for the prevention of backflow, it shall have first been approved by the Authority Having

19.1 Jurisdiction. Devices or assemblies shall be tested in accordance with recognized
19.2 standards or other standards acceptable to the Authority Having Jurisdiction. Backflow
19.3 prevention devices and assemblies shall comply with Table 603.2, except for specific
19.4 applications and provisions as stated in Sections 603.5.1 through 603.5.21.

19.5 Devices or assemblies installed in a potable water supply system for protection
19.6 against backflow shall be maintained in good working condition by the person or persons
19.7 having control of such devices or assemblies. The devices or assemblies shall be tested
19.8 at the time of installation, repair, or relocation and not less than on an annual schedule
19.9 thereafter, or more often where required by the Authority Having Jurisdiction. Where
19.10 found to be defective or inoperative, the device or assembly shall be repaired or replaced.
19.11 No device or assembly shall be removed from use or relocated, or other device or
19.12 assembly substituted, without the approval of the Authority Having Jurisdiction.

19.13 Testing shall be performed by a certified backflow assembly tester in accordance
19.14 with ASSE Series 5000.

19.15 Subp. 2. Section 603.5.4. UPC section 603.5.4 is amended to read as follows:
19.16 603.5.4 Heat Exchangers. Heat exchangers used for heat transfer, heat recovery, or
19.17 solar heating shall protect the potable water system from being contaminated by the
19.18 heat-transfer medium.

19.19 603.5.4.1 Single-Wall Heat Exchanger. Installation of a single-wall heat
19.20 exchanger shall meet all of the following requirements:

19.21 (1) Connected to a low-pressure hot water boiler limited to a maximum of 30
19.22 pounds-force per square inch gauge (psig) (207 kPa) by an approved safety or
19.23 relief valve.

19.24 (2) Heater transfer medium is either potable water or contains fluids having a
19.25 toxicity rating or Class of 1.

19.26 (3) Bear a label with the word "Caution," followed by the following statements:

20.1 (a) The heat-transfer medium shall be water or other nontoxic fluid having a
 20.2 toxicity rating or Class of 1 as listed in Clinical Toxicology of Commercial
 20.3 Products, 5th edition.

20.4 (b) The pressure of the heat-transfer medium shall be limited to a maximum
 20.5 of 30 psig (207 kPa) by an approved safety or relief valve.

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

20.11 (4) A reduced-pressure principle backflow prevention assembly shall be installed
 20.12 on the building supply before the first branch.

20.13 **603.5.4.2 Double-Wall Heat Exchanger.** Double-wall heat exchangers
 20.14 shall separate the potable water from the heat-transfer medium by providing
 20.15 a space between the two walls that are vented to the atmosphere.

20.16 Subp. 3. **Section 603.5.12.** UPC section 603.5.12 is amended to read as follows:

20.17 **603.5.12 Beverage Dispensers.** Potable water supply to beverage dispensers,
 20.18 carbonated beverage dispensers, or coffee machines shall be protected by an
 20.19 air gap or a vented backflow preventer in accordance with ASSE 1022. For
 20.20 carbonated beverage dispensers, piping materials installed downstream of the
 20.21 backflow preventer shall not be made of copper or be affected by carbon dioxide
 20.22 gas.

20.23 Subp. 4. **Section 603.5.18.** UPC section 603.5.18 is amended to read as follows:

20.24 **603.5.18 Potable Water Outlets and Valves.** Potable water outlets, freeze-proof
 20.25 yard hydrants, combination stop-and-waste valves, or other fixtures that incorporate a
 20.26 stop-and-waste feature that drains into the ground shall not be installed underground

21.1 except for a freeze-proof yard hydrant that is located at least two feet above the water
21.2 table and at least ten feet from any sewer or similar source of contamination.

21.3 Subp. 5. Section 603.5. UPC section 603.5 is amended by adding the following
21.4 subsections:

A barometric loop is an acceptable method of backflow protection of

21.5 603.5.22 Barometric Loop. ^W Water connections where an actual or potential backflow

21.6 or backsiphonage hazard exists not subject to backpressure may be protected with a

21.7 barometric loop. ^{that is} A barometric loop is a section of pipe in the shape of an inverted "u"

21.8 located upstream and rising 35 feet above the highest fixture it supplies.

21.9 603.5.23 Installation of Testable Backflow Prevention Assembly. Testable

21.10 backflow prevention assemblies meeting ASSE Standard 1013, 1015, 1020, 1047,

21.11 1048, or 1056 must be installed, tested, maintained, and removed in accordance with

21.12 sections 603.5.23.1 through 603.5.23.4.

21.13 603.5.23.1, Notification of Installation. The administrative authority must be

21.14 notified before installation of a testable backflow prevention assembly. The

21.15 public water supplier must be notified of the installed testable backflow preventer

21.16 assembly within 30 days following installation on a community public water

21.17 system.

21.18 603.5.23.2, Testing and Maintenance. The installation of a testable backflow

21.19 prevention assembly shall be permitted only when a periodic testing and

21.20 inspection program conducted by qualified personnel will be provided by an

21.21 agency acceptable to the administrative authority. Inspection intervals shall

21.22 not exceed one year. The administrative authority may require more frequent

21.23 testing if deemed necessary to ensure protection of the potable water. A testable

21.24 backflow prevention assembly must be inspected after initial installation to

21.25 ensure that it has been properly installed and that debris resulting from the piping

21.26 installation has not interfered with the functioning of the assembly.

22.1 **603.5.23.3 Inspection and Records.** A test and inspection tag must be affixed
 22.2 to the testable backflow prevention assembly. The tester shall date and sign
 22.3 the tag and include the tester's backflow prevention tester certification number.
 22.4 Written records of testing and maintenance must be maintained and submitted to
 22.5 the administrative authority, and to the public water supplier, within 30 days of
 22.6 testing if installed on a community public water system.

22.7 **603.5.23.4 Notification of Removal.** The ^A authority ^H having ^J jurisdiction, in
 22.8 addition to the public water supplier, must be notified within 30 days following
 22.9 removal of a testable backflow prevention assembly from a community public
 22.10 water system.

22.11 **4714.0604 MATERIALS.**

22.12 UPC section 604.11 is amended to read as follows:

22.13 **604.11 Lead Content.** Water pipe and fittings with a lead content which exceeds a
 22.14 weighted average of 0.25 percent in the wetted surface material, as established in the
 22.15 Safe Drinking Water Act, section 1417(d), shall be prohibited in piping systems used
 22.16 to convey potable water.

22.17 **4714.0608 WATER PRESSURE, PRESSURE REGULATORS, PRESSURE**
 22.18 **RELIEF VALVES, AND VACUUM RELIEF VALVES.**

22.19 UPC section 608.5 is amended to read as follows:

22.20 **608.5 Drains.** Relief valves located inside a building shall be provided with a drain, ^{that is:} not
 22.21 smaller than the relief valve outlet, ⁿ of galvanized steel, ^{or} hard-drawn copper piping and
 22.22 fittings, CPVC, PP, or listed relief valve drain tube with fittings that will not reduce the
 22.23 internal bore of the pipe or tubing (straight lengths as opposed to coils) and shall terminate
 22.24 within 18 inches of:

- 22.25 (1) the floor; or
- 22.26 (2) a safe place of disposal.

23.1 Relief valve drains shall not terminate in a building's crawl space. No part of a drain
 23.2 pipe shall be trapped or subject to freezing. The terminal end of the drain pipe shall
 23.3 not be threaded.

23.4 **4714.0609 INSTALLATION, TESTING, UNIONS, AND LOCATION.**

23.5 Subpart 1. Section 609.6. UPC section 609.6 is amended to read as follows:
 23.6 **609.6 Location.** Except as provided in Section 609.7, no building supply shall be located
 23.7 in a lot other than the lot that is the site of the building or structure served by the building
 23.8 supply.

23.9 **609.6.1 Water supply near sources of ^{contamination} pollution.** Potable water supply pipes must
 23.10 not be located in, under, or above cesspools, septic tanks, septic tank drainage fields,
 23.11 seepage pits, soil treatment systems, contaminated soil, sewer manholes, catch basins,
 23.12 storm water storage tanks, buried tanks containing chemicals or petroleum products,
 23.13 or any other source of ^{contamination} pollution that in the judgment of the administrative authority
 23.14 might contaminate the potable water supply. A horizontal separation of ten feet must
 23.15 be maintained between the outer edge of the water supply pipe and the outer edge of
 23.16 the contamination source.

23.17 Subp. 2. Section 609. UPC section 609 is amended by adding the following
 23.18 subsection:

23.19 **609.11 Water Meters.** Water meters shall be located inside a building, installed at least
 23.20 12 inches above the finished floor, and readily accessible. All water meter installations
 23.21 shall be rigidly supported with a permanent support in order to prevent the meter from
 23.22 vibrating when the water is passing through it.

23.23 **Exceptions:** Where installation inside a building is not possible, the water meter may
 23.24 be installed in an enclosed structure not subject to flooding, high groundwater, or
 23.25 surface drainage runoff, provided the meter is protected from freezing. Provisions
 23.26 shall be made to install the meters above grade when possible. When installed below

- 24.1 grade, the top of the structure shall be located at least 12 inches above the finished
 24.2 grade, be secured, and be accessible. This structure shall not be connected to any
 24.3 storm or sanitary sewer system.

24.4 **4714.0610 SIZE OF POTABLE WATER PIPING.**

- 24.5 UPC section 610, Table 610.3, is amended to read as follows:

24.6 **TABLE 610.3**

24.7 **Water Supply Fixture Units (WSFU) and Minimum Fixture Branch Pipe Sizes³**

24.8	<u>Appliances, Appurtenances, or Fixtures²</u>	<u>Minimum Fixture Branch Pipe Size^{1,4}</u>	<u>Private</u>	<u>Public</u>	<u>Assembly⁶</u>
24.9		<u>(inches)</u>			
24.10	<u>Bathtub or Combination</u>	<u>1/2</u>	<u>4.0^{1,4}</u>	<u>4.0</u>	<u>=</u>
24.11	<u>Bath/Shower (fill)</u>	<u>3/4</u>	<u>10.0</u>	<u>10.0</u>	<u>=</u>
24.12	<u>3/4-inch Bathtub Fill Valve</u>	<u>1/2</u>	<u>1.0</u>	<u>=</u>	<u>=</u>
24.13	<u>Bidet</u>	<u>1/2</u>	<u>4.0</u>	<u>4.0</u>	<u>=</u>
24.14	<u>Clothes Washer</u>	<u>1/2</u>	<u>=</u>	<u>1.0</u>	<u>=</u>
24.15	<u>Dental Unit, cuspidor</u>	<u>1/2</u>	<u>1.5</u>	<u>1.5</u>	<u>=</u>
24.16	<u>Dishwasher, domestic</u>	<u>1/2</u>	<u>0.5</u>	<u>0.5</u>	<u>0.75</u>
24.17	<u>Drinking Fountain or Water</u>	<u>1/2</u>	<u>0.5</u>	<u>0.5</u>	<u>0.75</u>
24.18	<u>Cooler</u>	<u>1/2</u>	<u>2.5</u>	<u>2.5</u>	<u>=</u>
24.19	<u>Hose Bibb</u>	<u>1/2</u>	<u>1.0</u>	<u>1.0</u>	<u>=</u>
24.20	<u>Hose Bibb, each additional⁸</u>	<u>1/2</u>	<u>1.0</u>	<u>1.0</u>	<u>=</u>
24.21	<u>Lavatory (each basin), or hand</u>	<u>1/2</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>
24.22	<u>sink</u>	<u>=</u>	<u>1.0</u>	<u>1.0</u>	<u>=</u>
24.23	<u>Lawn sprinkler, each head⁵</u>	<u>=</u>	<u>12.0</u>	<u>=</u>	<u>=</u>
24.24	<u>Mobile Home, each (minimum)</u>	<u>=</u>	<u>=</u>	<u>=</u>	<u>=</u>
24.25	<u>Sinks</u>	<u>=</u>	<u>=</u>	<u>=</u>	<u>=</u>
24.26	<u>Bar</u>	<u>1/2</u>	<u>1.0</u>	<u>2.0</u>	<u>=</u>
24.27	<u>Clinic Faucet</u>	<u>1/2</u>	<u>=</u>	<u>3.0</u>	<u>=</u>
24.28	<u>Clinic Flushometer Valve with or</u>	<u>1</u>	<u>=</u>	<u>8.0</u>	<u>=</u>
24.29	<u>without faucet</u>	<u>=</u>	<u>=</u>	<u>=</u>	<u>=</u>

25.1	<u>Kitchen, domestic with or</u>				
25.2	<u>without dishwasher</u>	<u>1/2</u>	<u>1.5</u>	<u>1.5</u>	<u>=</u>
25.3	<u>Laundry</u>	<u>1/2</u>	<u>1.5</u>	<u>1.5</u>	<u>=</u>
25.4	<u>Service or Mop Basin</u>	<u>1/2</u>	<u>1.5</u>	<u>3.0</u>	<u>=</u>
25.5	<u>Washup, each set of faucets</u>	<u>1/2</u>	<u>=</u>	<u>2.0</u>	<u>=</u>
25.6	<u>Shower, per head</u>	<u>1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>=</u>
25.7	<u>Urinal, 1.0 GPF Flushometer</u>				
25.8	<u>Valve</u>	<u>3/4</u>	<u>See Footnote⁷</u>		<u>=</u>
25.9	<u>Urinal, greater than 1.0 GPF</u>				
25.10	<u>Flushometer Valve</u>	<u>3/4</u>	<u>See Footnote⁷</u>		<u>=</u>
25.11	<u>Urinal, flush tank</u>	<u>1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>3.0</u>
25.12	<u>Wash Fountain, circular spray</u>	<u>3/4</u>	<u>=</u>	<u>4.0</u>	<u>=</u>
25.13	<u>Water Closet, 1.6 GPF Gravity</u>				
25.14	<u>Tank</u>	<u>1/2</u>	<u>2.5</u>	<u>2.5</u>	<u>3.5</u>
25.15	<u>Water Closet, 1.6 GPF</u>				
25.16	<u>Flushometer Tank</u>	<u>1/2</u>	<u>2.5</u>	<u>2.5</u>	<u>3.5</u>
25.17	<u>Water Closet, 1.6 GPF</u>				
25.18	<u>Flushometer Valve</u>	<u>1</u>	<u>See Footnote⁷</u>		<u>=</u>
25.19	<u>Water Closet, greater than 1.6</u>				
25.20	<u>GPF Gravity Tank</u>	<u>1/2</u>	<u>3.0</u>	<u>5.5</u>	<u>7.0</u>
25.21	<u>Water Closet, greater than 1.6</u>				
25.22	<u>GPF Flushometer Valve</u>	<u>1</u>	<u>See Footnote⁷</u>		<u>=</u>

25.23 For SI units: 1 inch = 25 mm

25.24 **Notes:**

25.25 ¹ Size of the cold branch pipe, or both the hot and cold branch pipes.

25.26 ² Appliances, appurtenances, or fixtures not referenced in this table shall be permitted to be sized by reference to fixtures having a similar flow rate and frequency of use.

25.28 ³ The listed fixture unit values represent their load on the cold water building supply.

25.29 The separate cold water and hot water fixture unit value for fixtures having both hot
 25.30 and cold water connections shall be permitted to be each taken as three-quarters of the
 25.31 listed total value of the fixture.

26.1 ⁴ The listed minimum supply branch pipe sizes for individual fixtures are the nominal
26.2 (I.D.) pipe size.

26.3 ⁵ For fixtures or supply connections likely to impose continuous flow demands, determine
26.4 the required flow in gallons per minute (gpm) (L/s), and add it separately to the demand in
26.5 gpm (L/s) for the distribution system or portions thereof.

26.6 ⁶ Assembly [Public Use]. See Minnesota Rules, chapter 1305, International Building Code.

26.7 ⁷ Where sizing flushometer systems, see Section 610.10.

26.8 ⁸ Reduce fixture unit loading for additional hose bibbs is to be used where sizing total
26.9 building demand and for pipe sizing where more than one hose bibb is supplied by a
26.10 segment of water distribution pipe. The fixture branch to each hose bibb shall be sized
26.11 on the basis of 2.5 fixture units.

26.12 **4714.0611 WATER CONDITIONING EQUIPMENT.**

26.13 UPC sections 611.0 to 611.3 are amended to read as follows:

26.14 **611.0 Water Conditioning Equipment.**

26.15 **611.1 Application.** Water conditioning equipment shall comply with the requirements
26.16 in this section. *that is not listed (Third-party certified)*

26.17 **611.1.1 Definition.** Water conditioning equipment means any appliance,
26.18 appurtenance, or fixture, or any combination thereof, designed to treat potable
26.19 water, so as to alter, modify, add, or remove any minerals, chemicals, or bacteria
26.20 contained in water. Water conditioning equipment includes but is not limited to
26.21 ion exchange water softeners, backwashing water filters, oxidizing water filters,
26.22 cartridge filters, chemical feed cartridges, ultraviolet lights, and equipment for reverse
26.23 osmosis, ultrafiltration, nanofiltration, pH adjustment, nitrate and arsenic removal,
26.24 and adsorption onto activated carbon.

26.25 **611.1.2 Manufacture and Assembly.** Water conditioning equipment ¹may be
26.26 manufactured as a complete system or ^{1 2)}may be assembled as a complete system by

26.27 a licensed ~~plumber~~ or licensed water conditioning contractor ³ using various types
plumbing contractor

27.1 of water conditioning equipment. Wetted materials used in water conditioning
 27.2 equipment shall comply with ANSI/NSF 61 standards, or the equipment shall comply
 27.3 with the applicable NSF standards as listed in Table 1401.1.

27.4 **Exception:** Water conditioning equipment intended to treat water for nonpotable
 27.5 uses that are protected by an approved backflow device, assembly, or method as
 27.6 required in Chapter 6.

27.7 **611.1.3 Labeling.** All conditioning equipment must be labeled by the manufacturer,
 27.8 licensed plumber, or by the licensed water conditioning contractor who manufactured
 27.9 or assembled the equipment so as to clearly identify the type of equipment and the
 27.10 name and address of the manufacturer, licensed plumber, or licensed contractor who
 27.11 manufactured or assembled the equipment.

Handwritten notes:
 : 1)
 1) plumbing contractor;
 2) of equipment manufactured as a complete system;
 3) complete system;
 1) plumbing contractor; or 3)
 1) water conditioning contractor who
 of equipment manufactured as a complete system; or 2)

27.12 **611.2 Airgap Discharge.** Any discharge from water conditioning equipment shall enter
 27.13 the drainage system through an airgap in accordance with Table 603.3.1 or an airgap
 27.14 device in accordance with Table 603.2, NSF 58, or IAPMO PS 65.

27.15 **611.3 Connection Tubing.** The tubing to and from water conditioning units shall be of a
 27.16 size and material as recommended by the manufacturer. The tubing shall comply with
 27.17 the requirements of NSF 14, NSF 42, NSF 44, NSF 53, NSF 55, NSF 58, NSF 62, or the
 27.18 appropriate material standards referenced in Table 1401.1.

27.19 **4714.0701 MATERIALS.**

27.20 UPC section 701.1 is amended to read as follows:

27.21 **701.1 Drainage Piping.** Materials for drainage piping shall be in accordance with one of
 27.22 the referenced standards in Table 701.1 except that:

27.23 (1) No galvanized wrought-iron or galvanized steel pipe shall be used underground and
 27.24 shall be kept not less than 6 inches (152 mm) aboveground.

27.25 (2) ABS and PVC DWV piping installations shall be installed in accordance with
 27.26 applicable standards referenced in Table 1401.1.

28.1 (3) No vitrified clay pipe or fittings shall be used aboveground or where pressurized by a
 28.2 pump or ejector. They shall be kept not less than 12 inches (305 mm) belowground.

28.3 (4) Copper tube for drainage and pipe venting shall have a weight of not less than that of
 28.4 copper drainage tube type DWV.

28.5 (5) Stainless steel 304 pipe and fittings shall not be installed underground and shall be kept
 28.6 not less than 6 inches (152 mm) aboveground.

28.7 (6) Cast-iron soil pipe and fittings shall be listed and tested in accordance with standards
 28.8 referenced in Table 1401.1. Such pipe and fittings shall be marked with country of
 28.9 origin and identification of the original manufacturer in addition to markings required
 28.10 by referenced standards.

28.11 **4714.0702 FIXTURE UNIT EQUIVALENTS.**

28.12 UPC section 702, Table 702.1, is amended to read as follows:

28.13 **TABLE 702.1**

28.14 **Drainage Fixture Unit Values (DFU)**

28.15	<u>Minimum</u>			
28.16	<u>Size Trap and</u>			
28.17	<u>Trap Art⁶</u>			
28.18	<u>Plumbing Appliances,</u> <u>Appurtenances, or Fixtures</u>	<u>(inches)</u>	<u>Private</u>	<u>Public</u> <u>Assembly⁷</u>
28.19	<u>Bathtub or Combination</u>			
28.20	<u>Bath/Shower</u>	<u>1 1/2</u>	<u>2.0</u>	<u>2.0</u> <u>—</u>
28.21	<u>Bidet</u>	<u>1 1/4</u>	<u>1.0</u>	<u>—</u> <u>—</u>
28.22	<u>Bidet</u>	<u>1 1/2</u>	<u>2.0</u>	<u>—</u> <u>—</u>
28.23	<u>Clothes Washer, Domestic,</u>			
28.24	<u>Standpipe⁵</u>	<u>2</u>	<u>3.0</u>	<u>3.0</u> <u>3.0</u>
28.25	<u>Dental Unit, Cuspidor</u>	<u>1 1/4</u>	<u>—</u>	<u>1.0</u> <u>1.0</u>
28.26	<u>Dishwasher, Domestic, with</u>			
28.27	<u>Independent Drain²</u>	<u>1 1/2</u>	<u>2.0</u>	<u>2.0</u> <u>2.0</u>
28.28	<u>Drinking Fountain or Water</u>			
28.29	<u>Cooler</u>	<u>1 1/4</u>	<u>0.5</u>	<u>0.5</u> <u>1.0</u>
28.30	<u>Food Waste Grinder, Commercial</u>	<u>2</u>	<u>—</u>	<u>3.0</u> <u>3.0</u>

29.1	<u>Floor Drain, Emergency</u>	<u>2</u>	=	<u>0.0</u>	<u>0.0</u>
29.2	<u>Floor Drain (for Additional Sizes</u>				
29.3	<u>see Section 702.0)</u>	<u>2</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>
29.4	<u>Shower, Single-Head Trap</u>	<u>2</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>
29.5	<u>Shower, Multi-Head, Each</u>				
29.6	<u>Additional</u>	<u>2</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>
29.7	<u>Lavatory, Single</u>	<u>1 1/4</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>
29.8	<u>Lavatory, in Sets of Two or Three</u>	<u>1 1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>
29.9	<u>Washfountain</u>	<u>1 1/2</u>	=	<u>2.0</u>	<u>2.0</u>
29.10	<u>Washfountain</u>	<u>2</u>	=	<u>3.0</u>	<u>3.0</u>
29.11	<u>Mobile Home, Trap</u>	<u>3</u>	<u>12.0</u>	=	=
29.12	<u>Receptor, Indirect Waste^{1,3}</u>	<u>1 1/2</u>		<u>See footnote^{1,3}</u>	
29.13	<u>Receptor, Indirect Waste^{1,4}</u>	<u>2</u>		<u>See footnote^{1,4}</u>	
29.14	<u>Receptor, Indirect Waste¹</u>	<u>3</u>		<u>See footnote¹</u>	
29.15	<u>Sinks</u>	=	=	=	=
29.16	<u>Bar</u>	<u>1 1/2</u>	<u>1.0</u>	=	=
29.17	<u>Bar²</u>	<u>1 1/2</u>	=	<u>2.0</u>	<u>2.0</u>
29.18	<u>Clinical</u>	<u>3</u>	=	<u>6.0</u>	<u>6.0</u>
29.19	<u>Commercial With Food Waste²</u>	<u>1 1/2</u>	=	<u>3.0</u>	<u>3.0</u>
29.20	<u>Commercial Pot or Scullery</u>	<u>2</u>	=	<u>4.0</u>	<u>4.0</u>
29.21	<u>Special Purpose²</u>	<u>1 1/2</u>	<u>2.0</u>	<u>3.0</u>	<u>3.0</u>
29.22	<u>Special Purpose</u>	<u>2</u>	<u>3.0</u>	<u>4.0</u>	<u>4.0</u>
29.23	<u>Special Purpose</u>	<u>3</u>	=	<u>6.0</u>	<u>6.0</u>
29.24	<u>Kitchen, Domestic² (with or</u>				
29.25	<u>without food waste grinder,</u>				
29.26	<u>dishwasher, or both)</u>	<u>1 1/2</u>	<u>2.0</u>	<u>2.0</u>	=
29.27	<u>Laundry² (with or without</u>				
29.28	<u>discharge from a clothes washer)</u>	<u>1 1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>2.0</u>
29.29	<u>Service or Mop Basin</u>	<u>2</u>	=	<u>3.0</u>	<u>3.0</u>
29.30	<u>Service or Mop Basin</u>	<u>3</u>	=	<u>3.0</u>	<u>3.0</u>
29.31	<u>Service, Flushing Rim</u>	<u>3</u>	=	<u>6.0</u>	<u>6.0</u>
29.32	<u>Wash, Each Set of Faucets</u>	=	=	<u>2.0</u>	<u>2.0</u>

30.1	<u>Urinal, Integral Trap 1.0 GPF²</u>	<u>2</u>	<u>2.0</u>	<u>2.0</u>	<u>5.0</u>
30.2	<u>Urinal, Integral Trap Greater</u>				
30.3	<u>Than 1.0 GPF</u>	<u>2</u>	<u>2.0</u>	<u>2.0</u>	<u>6.0</u>
30.4	<u>Urinal, Exposed Trap²</u>	<u>1 1/2</u>	<u>2.0</u>	<u>2.0</u>	<u>5.0</u>
30.5	<u>Water Closet, 1.6 GPF Gravity</u>				
30.6	<u>Tank</u>	<u>3</u>	<u>3.0</u>	<u>4.0</u>	<u>6.0</u>
30.7	<u>Water Closet, 1.6 GPF</u>				
30.8	<u>Flushometer Tank</u>	<u>3</u>	<u>3.0</u>	<u>4.0</u>	<u>6.0</u>
30.9	<u>Water Closet, 1.6 GPF</u>				
30.10	<u>Flushometer Valve</u>	<u>3</u>	<u>3.0</u>	<u>4.0</u>	<u>6.0</u>
30.11	<u>Water Closet, Greater Than 1.6</u>				
30.12	<u>GPF Gravity Tank⁶</u>	<u>3</u>	<u>4.0</u>	<u>6.0</u>	<u>8.0</u>
30.13	<u>Water Closet, Greater Than 1.6</u>				
30.14	<u>GPF Flushometer Valve</u>	<u>3</u>	<u>4.0</u>	<u>6.0</u>	<u>8.0</u>

30.15 For SI units: 1 inch = 25 mm

30.16 **Notes:**

30.17 ¹ Indirect waste receptors shall be sized based on the total drainage capacity of the
 30.18 fixtures that drain therein to, in accordance with UPC Table 702.2(b).

30.19 ² Provide a 2-inch (50 mm) minimum drain.

30.20 ³ For refrigerators, coffee urns, water stations, and similar low demands.

30.21 ⁴ For commercial sinks, dishwashers, and similar moderate or heavy demands.

30.22 ⁵ Buildings having a clothes-washing area with clothes washers in a battery of three
 30.23 or more clothes washers shall be rated at 6-fixture units each for purposes of sizing
 30.24 common horizontal and vertical drainage piping.

30.25 ⁶ Trap sizes shall not be increased to the point where the fixture discharge is capable
 30.26 of being inadequate to maintain their self-scouring properties.

30.27 ⁷ Assembly [See Minnesota Rules, chapter 1305, International Building Code].

30.28 **4714.0704 FIXTURE CONNECTIONS (DRAINAGE).**

30.29 UPC section 704.3 is amended to read as follows:

31.1 **704.3 Commercial Dishwashing Machines and Sinks.** Pot sinks, scullery sinks,
31.2 commercial kitchen sinks, beverage service sinks, dishwashing sinks, silverware sinks,
31.3 commercial dishwashing machines, silverware-washing machines, and other similar
31.4 fixtures shall be connected directly to the drainage system. A floor drain constructed
31.5 without backwater valves shall be provided adjacent to the fixture, and the fixture shall be
31.6 connected on the sewer side of the floor drain trap, provided that no other drainage line is
31.7 connected between the floor drain waste connection and the fixture drain. The fixture and
31.8 floor drain shall be trapped and vented in accordance with this code.

31.9 **4714.0705 JOINTS AND CONNECTIONS.**

31.10 UPC subsection 705.10.2 is amended to read as follows:

31.11 **705.10.2 Expansion Joints.** Expansion joints shall be accessible and shall be
31.12 permitted to be used where necessary to provide for expansion and contraction
31.13 of the pipes.

31.14 **4714.0707 CLEANOUTS.**

31.15 UPC section 707.4 is amended by adding a new subsection:

31.16 **707.4.1 Back-to-Back.** A cleanout shall be provided on a common vertical
31.17 fixture drain or common vent serving two fixture traps that connect to a vertical
31.18 drain at the same level. The cleanout shall be the same nominal pipe size as the
31.19 drain serving the fixtures. Where the vertical drain is accessible through the trap
31.20 opening, the cleanout may be eliminated.

31.21 **4714.0710 DRAINAGE OF FIXTURES LOCATED BELOW THE NEXT**
31.22 **UPSTREAM MANHOLE OR BELOW THE MAIN SEWER LEVEL.**

31.23 Subpart 1. Section 710.12. UPC section 710.12 is amended to read as follows:

31.24 **710.12 Grinder Pump Ejector.** Grinder pumps shall be permitted to be used. The
31.25 sump basin storage volume and the pump capacity must be sized adequately to prevent
31.26 overloading and must at minimum accommodate water demand peak flow from all fixtures.

32.1 **710.12.1 Discharge Piping.** The discharge piping shall be sized in accordance with
 32.2 the manufacturer's installation instructions and shall be not less than 1 1/4 inches (32
 32.3 mm) in diameter. A check valve and fullway-type shutoff valve shall be located
 32.4 within the discharge line.

32.5 Subp. 2. Section 710.13. UPC section 710.13 is amended to read as follows:

32.6 **710.13 Macerating Toilet Systems.** Listed macerating toilet systems shall be permitted
 32.7 as an alternate to a sewage pump system. A macerating toilet system may only be
 32.8 installed in one- or two-family dwellings when gravity flow is not possible. Not more
 32.9 than one bathroom group, consisting of a toilet, a lavatory, and a shower or bathtub,
 32.10 may discharge into a macerating toilet system. Components of macerating toilet systems
 32.11 shall be accessible.

32.12 **710.13.1 Sumps.** The sump shall be ^{water-tight} ~~water-~~ and gas-tight.

32.13 **710.13.2 Discharge Piping.** The discharge piping shall be sized in accordance with
 32.14 the manufacturer's instructions and shall be not less than 3/4 of an inch (20 mm)
 32.15 in diameter. The developed length of the discharge piping shall not exceed the
 32.16 manufacturer's instructions. A check valve and fullway-type shutoff valve shall be
 32.17 located within the discharge line or internally within the device.

32.18 **710.13.3 Venting.** The plumbing fixtures that discharge into the macerating device
 32.19 shall be vented in accordance with this code. The sump shall be vented in accordance
 32.20 with the manufacturer's instructions and the vent shall be permitted to connect to
 32.21 the fixture venting.

32.22 **4714.0712 TESTING.**

32.23 Subpart 1. Section 712.1. UPC section 712.1 is amended to read as follows:

32.24 **712.1 Media.** The piping of the plumbing, drainage, and venting systems shall be tested
 32.25 with water or air. The Authority Having Jurisdiction shall be permitted to require the

^ necessary points of access

33.1 removal of cleanouts, etc., to ascertain whether the pressure has reached all parts of the
33.2 system.

33.3 Subp. 2. Section 712. UPC section 712 is amended by adding subsections to read
33.4 as follows:

^ the air test in section 712.3

33.5 712.4 Negative Test. In lieu of a ~~five-pound air test~~, concrete manholes and sewer lines
33.6 may be tested by negative pressure in accordance with ASTM Standards C1214-92 and
33.7 C1244-93.

33.8 712.5 Finished Plumbing. After the plumbing fixtures have been set and their traps filled
33.9 with water, their connections shall be tested and proven ^{*^ gas-tight*} ~~gas-~~ and water-tight by plugging
33.10 the stack openings on the roof and the building drain where it leaves the building, and
33.11 air introduced into the system equal to the pressure of a one-inch water column. Such
33.12 pressure shall remain constant for 15 minutes or the duration of the inspection without
33.13 the introduction of additional air.

33.14 712.6 Test Plugs or Caps. Test plugs or caps for roof terminals must extend above or
33.15 outside the end of the vent pipe to provide a visible indication for removal after the test
33.16 has been completed.

33.17 4714.0713 SEWER REQUIRED.

33.18 Subpart 1. Section 713.1. UPC section 713.1 is amended to read as follows:

33.19 713.1 Where Required. A building in which plumbing fixtures are installed and premises
33.20 having drainage piping thereon shall have a connection to a public or private sewer, except
33.21 as provided in sections 713.2 and 713.4 and Minnesota Rules, part 4714.0101, subpart 6.

33.22 Subp. 2. Section 713.5. UPC section 713.5 is deleted in its entirety.

33.23 Subp. 3. Section 713.7. UPC section 713.7 is amended to read as follows:

33.24 713.7 Installation. In cities, counties, or both where the installation of building sewers is
33.25 under the jurisdiction of a municipal utility easement, the provisions of this code relating
33.26 to building sewers do not apply.

34.1 **Exception:** Single-family dwellings and buildings or structures accessory thereto,
 34.2 existing and connected to an approved private sewage disposal system prior to the
 34.3 time of connecting the premises to the public sewer shall be permitted, where no
 34.4 hazard, nuisance, or insanitary condition is evidenced and written permission has
 34.5 been obtained from the Authority Having Jurisdiction, remain connected to the
 34.6 properly maintained private sewage disposal system where there is insufficient grade
 34.7 or fall to permit drainage to the sewer by gravity.

34.8 **4714.0714 DAMAGE TO PUBLIC SEWER OR PRIVATE SEWAGE DISPOSAL**
 34.9 **SYSTEM.**

34.10 UPC section 714.5 is amended to read as follows:

34.11 **714.5 Tanks.** ~~An approved type~~^{is} watertight sewage or wastewater holding tank, the
 34.12 contents of which, due to ~~their~~^{its} character, shall be periodically removed and disposed of at
 34.13 some approved off-site location, ~~shall~~^{is} be installed where required by the Authority Having
 34.14 Jurisdiction, ~~to prevent anticipated surface or subsurface contamination or pollution,~~^{in accordance with the Minnesota Pollution Control regulations and}
 34.15 ~~damage to the public sewer, or other hazardous or nuisance conditions,~~^{or b.}

34.16 **4714.0715 BUILDING SEWER MATERIALS.**

34.17 UPC section 715.3 is amended to read as follows:

34.18 **715.3 Existing Sewers.** Replacement of existing building sewer and building storm
 34.19 sewers using cured-in-place pipe lining trenchless methodology and materials shall be
 34.20 installed in accordance with ASTM F 1216. Replacement using cured-in-place pipe liners
 34.21 must not be used on collapsed piping or when the existing piping is compromised to a point
 34.22 where the installation of the liners will not eliminate hazardous or insanitary conditions.

34.23 **4714.0717 SIZE OF BUILDING SEWERS.**

34.24 UPC section 717, Table 717.1, is amended to read as follows:

TABLE 717.1

Maximum/Minimum Fixture Unit Loading on Building Sewer Piping

35.1	<u>SLOPE (inches per foot)</u>			
	<u>Size of Pipe (inches)</u>	<u>1/16</u>	<u>1/8</u>	<u>1/4</u>
35.2				
35.3	<u>6 and smaller</u>	<u>(As specified in Table 703.2/No minimum loading)</u>		
35.4	<u>8</u>	<u>1950/1500</u>	<u>2800/625</u>	<u>3900/275</u>
35.5	<u>10</u>	<u>3400/1600</u>	<u>4900/675</u>	<u>6800/300</u>
35.6	<u>12</u>	<u>5600/1700</u>	<u>8000/725</u>	<u>11 200/352</u>

35.7 For SI units: 1 inch = 25 mm, 1 inch per foot = 83.3 mm/m

○ > *Insert amended Table 721.1*

35.8 **4714.0722 ABANDONED SEWERS AND SEWAGE DISPOSAL FACILITIES.**

35.9 UPC sections 722.0 to 722.5 are deleted in their entirety.

35.10 **4714.0723 BUILDING SEWER TEST.**

35.11 UPC section 723.1 is amended to read as follows:

35.12 **723.1 General.** Building sewers shall be tested by plugging the end of the building sewer
 35.13 at its points of connection with the public sewer or private sewage disposal system and
 35.14 completely filling the building sewer with water from the lowest to the highest point
 35.15 thereof, or by approved equivalent low-pressure air test. Testing of building sewers shall
 35.16 be in accordance with Section 712. The building sewer shall be gastight or watertight.

35.17 **4714.0724 RECREATIONAL VEHICLE SANITARY DISPOSAL STATION.**

35.18 UPC chapter 7 is amended by adding the following sections:

35.19 **724.0 Recreational Vehicle Sanitary Disposal Station.**

35.20 **724.1 Construction.** Each recreational vehicle sanitary disposal (dump) station shall have
 35.21 a concrete slab with the drainage system located as to be on the road (left) side of the
 35.22 recreational vehicle. The slab shall be not less than 3 feet by 3 feet (914 mm by 914 mm),
 35.23 not less than 3-1/2 inches (89 mm) thick, and properly reinforced. The slab surface must
 35.24 be troweled to a smooth finish and sloped from each side inward to a drainage system inlet.

35.25 The drainage system inlet shall consist of a 4-inch (102 mm), self-closing,
 35.26 foot-operated hatch of materials meeting these rules with the cover milled to fit tight. The
 35.27 hatch body shall be set in the concrete of the slab with the lip of the opening flush with

36.1 its surface to facilitate the cleansing of the slab with water. The hatch shall be properly
 36.2 connected to a drainage system inlet, which shall discharge to a public or private sewer
 36.3 meeting the standards of this section.

36.4 **724.2 Flushing Device.** The recreational vehicle sanitary disposal station flushing device
 36.5 shall consist of a supported riser terminating not less than 2 feet (610 mm) above the
 36.6 ground surface, with a 3/4 of an inch (20 mm) valved outlet adaptable for a flexible hose.
 36.7 The flexible hose shall be designed such that it cannot lie on the ground. The water supply
 36.8 to the flushing device shall be protected from backflow by means of a listed vacuum
 36.9 breaker or backflow prevention device located downstream from the last shutoff valve.

36.10 Adjacent to the recreational vehicle sanitary disposal station shall be posted a sign of
 36.11 durable material not less than 2 feet by 2 feet (610 mm by 610 mm) in size. Inscribed on
 36.12 the sign in clearly legible letters shall be the following:

36.13 "DANGER - NOT TO BE USED FOR DRINKING OR DOMESTIC PURPOSES."

36.14 **4714.0801 INDIRECT WASTES.**

36.15 Subpart 1. Section 801.2.2. UPC section 801.2.2 is amended to read as follows:

36.16 **801.2.2 Walk-In Coolers.** Floor drains shall not be located inside walk-in coolers

36.17 unless they are specifically required by the licensing authority. Where required, floor
 36.18 drains shall be ~~permitted to be~~ connected to a separate drainage line discharging into *of the food establishment*

36.19 an outside receptor. The flood-level rim of the receptor shall not be less than 6 inches

36.20 (152 mm) lower than the lowest floor drain. The floor drains shall be trapped and

36.21 individually vented. Cleanouts shall be provided at 90 degree (1.57 rad) turns and

36.22 shall be accessibly located. The waste shall discharge through an air gap or air break

36.23 into a trapped and vented receptor, except that a full-size air gap is required where

36.24 the indirect waste pipe is under vacuum.

36.25 Subp. 2. Section 801.2.3. UPC section 801.2.3 is amended to read as follows:

37.1 **801.2.3 Food-Handling Fixtures.** Cooking ranges, steam kettles, potato peelers,
 37.2 ice cream dipper wells, and similar equipment shall be indirectly connected to the
 37.3 drainage system by means of an air gap. Bins, cooling counters, compartments, and
 37.4 other equipment having drainage connections and used for the storage of unpackaged
 37.5 ice used for human ingestion, or used in direct contact with ready-to-eat food, shall be
 37.6 indirectly connected to the drainage system by means of an air gap. Each indirect waste
 37.7 pipe from food-handling fixtures, storage or holding compartments, or equipment shall
 37.8 be separately trapped and piped to the indirect waste receptor and shall not combine
 37.9 with other indirect waste pipes. The piping from the equipment to the receptor shall
 37.10 be not less than the drain on the unit, and in no case less than 3/4 of an inch (20 mm).

37.11 Subp. 3. Section 801.3. UPC section 801.3 is deleted in its entirety.

37.12 **4714.0804 INDIRECT WASTE RECEPTORS.**

37.13 UPC section 804 is amended by adding the following subsection:

37.14 **804.2 Domestic or Culinary Type Fixtures Prohibited as Receptors.** No plumbing
 37.15 fixture that is used for domestic or culinary purposes shall be used to receive the discharge
 37.16 of an indirect waste. Domestic use dishwashers may discharge into a sink, or discharge to
 37.17 a sink tailpiece or food-waste grinder when installed in accordance with Section 807.4.

37.18 **4714.0813 SWIMMING POOLS.**

37.19 UPC section 813.1 is amended to read as follows:

37.20 **813.1 General.** Pipes carrying wastewater from swimming or wading pools, including pool
 37.21 drainage and backwash from filters, including water from scum gutter drains and pool deck
 37.22 drains, shall be installed as an indirect waste. Where a pump is used to discharge waste pool
 37.23 water to the drainage system, the pump discharge shall be installed as an indirect waste.

37.24 **4714.0814 CONDENSATE WASTES AND CONTROL.**

37.25 Subpart 1. Section 814.1. UPC section 814.1 is amended to read as follows:

38.1 **814.1 Condensate Disposal.** Condensate from air washers, air-cooling coils, fuel-burning
 38.2 condensing appliances, the overflow from evaporative coolers, and similar water-supplied
 38.3 equipment or similar air-conditioning equipment shall be collected and discharged to an
 38.4 approved plumbing fixture or disposal area. Where discharged into the drainage system,
 38.5 equipment shall drain by means of an indirect waste pipe. The waste pipe shall have a
 38.6 slope of not less than 1/8 inch per square foot (10.4 mm/m) or 1 percent slope and shall be
 38.7 made of an approved corrosion-resistant material.

38.8 Subp. 2. UPC Table 814.1 is deleted.

38.8 Subp. 2. Section 814.2. UPC section 814.2 is deleted in its entirety.

38.9 Subp. 3. Section 814.3. UPC section 814.3 is amended to read as follows:

38.10 **814.3 Point of Discharge.** Air-conditioning condensate waste pipes shall connect

38.11 indirectly to the ^{interior} drainage system through an air gap or air break to properly trapped and

38.12 vented receptors, the tailpiece of an approved plumbing fixture, or to ^{an exterior place of disposal} a place of disposal

38.13 approved by the ^{or 2)} Pollution Control Agency.

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

38.15 **4714.0902 VENTS NOT REQUIRED.**

38.16 UPC section 902.2 is deleted in its entirety.

38.17 **4714.0903 MATERIALS.**

38.18 UPC section 903.1 is amended to read as follows:

38.19 **903.1 Applicable Standards.** Vent pipe and fittings shall comply with the applicable
 38.20 standards referenced in Table 701.1, except that:

38.21 (1) No galvanized steel or 304 stainless steel pipe shall be installed underground and shall
 38.22 be not less than 6 inches (152 mm) aboveground.

38.23 (2) ABS and PVC DWV piping installations shall be in accordance with the applicable
 38.24 standards referenced in Table 1401.1.

38.25 **4714.0905 VENT PIPE GRADES AND CONNECTIONS.**

38.26 UPC section 905.3 is amended to read as follows:

39.1 **905.3 Vent Pipe Rise.** Except as provided elsewhere in this code, each vent shall rise
 39.2 vertically to a point not less than 6 inches (152 mm) above the flood-level rim of the fixture
 39.3 served before offsetting horizontally, and where two or more vent pipes converge, each
 39.4 such vent pipe shall rise to a point not less than 6 inches (152 mm) in height above the
 39.5 flood-level rim of the plumbing fixture it serves before being connected to any other vent.

39.6 **4714.0906 VENT TERMINATION.**

39.7 Subpart 1. **Section 906.1.** UPC section 906.1 is amended to read as follows:

39.8 **906.1 Roof Termination.** Each vent pipe or stack shall extend through its flashing and
 39.9 shall terminate vertically not less than 12 inches (304 mm) above the roof.

39.10 Subp. 2. **Section 906.3.** UPC section 906.3 is amended to read as follows:

39.11 **906.3 Use of Roof.** Vent pipes shall be extended separately or combined ^{of} full required
 39.12 size, not less than 12 inches (304 mm) above the roof. Flagpoling of vents shall be ^{and}
 39.13 prohibited except where the roof is used for purposes other than weather protection. Vents
 39.14 within 10 feet (3,048 mm) of a part of the roof that is used for such other purposes shall
 39.15 extend not less than 7 feet (2,134 mm) above the roof and shall be securely stayed.

39.16 Subp. 3. **Section 906.7.** UPC section 906.7 is amended to read as follows:

39.17 **906.7 Frost or Snow Closure.** Vent terminals shall be not less than 2 inches (50 mm) in
 39.18 diameter, ^{and shall not be} but in no event smaller than the required vent pipe. ^{Any} The change in diameter shall
 39.19 be made inside the building not less than ^{12 inches} 1 foot (305 mm) below the roof in an insulated
 39.20 space and terminate not less than ^{12 inches} 1 foot (304 mm) above the roof.

39.21 **4714.1001 TRAPS REQUIRED.**

39.22 UPC section 1001.1 is amended to read as follows:

39.23 **1001.1 Where Required.** Each plumbing fixture shall be separately trapped by an
 39.24 approved type of liquid seal trap. This section shall not apply to fixtures with integral
 39.25 traps. Not more than one trap shall be permitted on a trap arm. Food waste disposal units
 39.26 installed with a set of restaurant, commercial, or industrial sinks shall be connected to

40.1 a separate trap. Each domestic clothes washer and each laundry tub shall be connected
 40.2 to a separate and independent trap, except that a laundry tub shall be permitted to also
 40.3 receive the waste from a clothes washer set adjacent thereto. The vertical distance
 40.4 between a fixture outlet and the trap weir shall be as short as practicable, but in no case
 40.5 shall the tailpiece from a fixture exceed 24 inches (610 mm) in length. One trap shall be
 40.6 permitted to serve a set of not more than three single compartment sinks or laundry tubs
 40.7 of the same depth or three lavatories immediately adjacent to each other and in the same
 40.8 room where the waste outlets are not more than 30 inches (762 mm) apart and the trap is
 40.9 centrally located where the three compartments are installed.

40.10 **4714.1007 TRAP SEAL PROTECTION.**

40.11 UPC section 1007 is deleted in its entirety.

40.12 **4714.1008 BUILDING TRAPS.**

40.13 UPC section 1008 is deleted in its entirety.

40.14 **4714.1009 INDUSTRIAL INTERCEPTORS (CLARIFIERS) AND SEPARATORS.**

40.15 UPC section 1009.2 is amended to read as follows:

40.16 **1009.2 Approval.** The size, type, and location of each interceptor (clarifier) or separator

40.17 shall meet the requirements of this chapter ^{or Exception} ~~except for~~ interceptors or separators that are

40.18 engineered and manufactured and are documented by the manufacturer and the project

40.19 design engineer to be properly designed and sized for the specific project, and ~~approved~~

40.20 by the Authority Having Jurisdiction. ~~Except where otherwise specifically permitted,~~ ^{are} ~~or~~

40.21 no wastes other than those requiring treatment or separation shall be discharged into

40.22 an interceptor (clarifier) ^{or separator unless specifically permitted elsewhere in this code}

40.23 **4714.1010 SLAUGHTERHOUSES, PACKING ESTABLISHMENTS, ETC.**

40.24 Subpart 1. **Section 1010.1.** UPC section 1010.1 is amended to read as follows:

41.1 **1010.1 Bottling Establishments.** Bottling plants shall discharge their process wastes
 41.2 into an interceptor that will provide for separation of broken glass or other solids before
 41.3 discharging liquid wastes into the drainage systems.

41.4 Subp. 2. Section 1010. UPC section 1010 is amended by adding the following
 41.5 subsection:

41.6 **1010.2 Slaughterhouses.** Slaughtering and dressing room drains shall be equipped with
 41.7 separators or interceptors approved by the administrative authority, which shall prevent
 41.8 the discharge into the drainage system of feathers, entrails, or other material likely to
 41.9 clog the drainage system.

41.10 **4714.1014 GREASE INTERCEPTORS.**

41.11 UPC section 1014.3.7 is amended to read as follows:

41.12 **1014.3.7 Abandoned Gravity Grease Interceptors.** Abandoned gravity grease
 41.13 interceptors shall be pumped and filled as required by the Authority Having
 41.14 Jurisdiction.

41.15 **4714.1017 OIL AND FLAMMABLE LIQUID INTERCEPTORS.**

41.16 Subpart 1. Section 1017.1. UPC section 1017.1 is amended as follows:

41.17 **1017.1 Interceptors Required.** Enclosed garages of over 1,000 square feet or housing
 41.18 more than four motor vehicles, repair garages, gasoline stations with grease racks, work or
 41.19 wash racks, auto washes, and all buildings where oily and/or flammable liquid wastes are
 41.20 produced as a result of manufacturing, storage, maintenance, repair, or testing processes,
 41.21 shall have an interceptor installed into which all oil, grease, and sand bearing and/or
 41.22 flammable wastes shall be discharged before emptying into the building drainage system
 41.23 or other point of disposal, when floor drains or trench drains are provided. The interceptor
 41.24 shall be located inside the building.

An interceptor shall be installed into which all oil, grease, and sand bearing and/or flammable wastes shall be separated before emptying into the building drainage system or other point of disposal when floor drains or trench drains are provided in the following:

a. enclosed garages of over 1,000 square feet or housing designed to have

b. 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.

c.

d.

e.

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

41.26 Subp. 2. Section 1017.2. UPC section 1017.2 is amended as follows:

42.1 **1017.2 Design of Interceptors.** Each interceptor shall be of watertight construction ^{and}

42.2 ~~of~~ not less than 35 cubic feet holding capacity, ^{and} be provided with a water seal of not less

42.3 than three inches on the inlet and not less than 18 inches on the outlet. The minimum

42.4 depth below the invert of the discharge drain shall be three feet. The minimum size of

42.5 the discharge drain shall be four inches. The interceptor ^{not less than} may be constructed either: (1)

42.6 ~~of~~ monolithic poured reinforced concrete with a minimum floor and wall thickness ^{of} ~~of~~ ^{not less than}

42.7 six inches ^{and} with protected treatment approved by the manufacturer for the intended use,

42.8 (2) ~~of~~ iron or steel of a minimum thickness ^{of} 3/16 inch ^{and} protected with an approved

42.9 corrosion-resistant coating on both the inside and the outside, or (3) ~~of~~ fiberglass resins

42.10 that comply with ASTM C-581 and meets IAPMO Material and Property Standard, PS

42.11 80-200¹⁸~~3~~, for clarifiers.

42.12 The interceptor must be provided with a nonperforated iron or steel cover and ring

42.13 of not less than 24 inches in diameter, and the air space in the top of the tank must have

42.14 a three-inch vent pipe ^{that is} constructed of approved metallic material, ^{and} extending separately

42.15 to a point at least 12 inches above the roof of the building. Drains and piping ^{required in} ~~from~~ section 1017.1

42.16 ~~motor vehicle areas~~ must be a minimum of three inches in size. Drains discharging to an

42.17 interceptor must not be trapped and must be constructed so as not to retain liquids. ^{Sand interceptors} ~~in~~ are permitted in

42.18 motor vehicle wash facilities, ^{bays or} a sand interceptor that meets the requirements of section

42.19 1016.0, ~~except that no water seal is permitted; may be installed~~ to receive wastes before

42.20 discharging into a flammable waste interceptor. ^{Sand interceptors must meet the} requirements of section 1016 ^{except that no} ~~except that no~~ water seal is

42.21 No cleanout, mechanical joint, or backwater valve shall be installed inside the ^{permitted}

42.22 interceptor which could provide a bypass of the trap seal. Only wastes that require

42.23 separation shall discharge into the interceptor, except that a water-supplied and trapped

42.24 sink may be connected to the vent of the interceptor. Whenever the outlet branch drain

42.25 serving an interceptor is more than 25 feet from a vented drain, the branch drain shall be

42.26 provided with a two-inch vent pipe. A backwater valve shall be installed in the outlet

43.1 branch drain whenever, in the judgment of the administrative authority, backflow from
43.2 the building drain could occur.

43.3 **4714.1101 GENERAL.**

43.4 Subpart 1. Section 1101.1. UPC section 1101.1 is amended to read as follows:

43.5 **1101.1 Where Required.** Roofs, paved areas, yards, courts, courtyards, vent shafts, light
43.6 wells, or similar areas having rainwater, shall be drained into a separate storm sewer system
43.7 or into a combined sewer system where a separate storm sewer system is not available, or
43.8 to some other place of disposal satisfactory to the Authority Having Jurisdiction. In the
43.9 case of one- and two-family dwellings, storm water shall be permitted to be discharged on
43.10 flat areas, such as lawns, so long as the storm water shall flow away from the building and
43.11 away from adjoining property and shall not create a nuisance. In no case shall water from
43.12 roofs or any building roof drainage be allowed to flow upon the public sidewalk.

43.13 Subp. 2. Section 1101.2. UPC section 1101.2 is amended to read as follows:

43.14 **1101.2 Storm Water Drainage to Sanitary Sewer Prohibited.** Storm water shall not be
43.15 drained into sewers intended for sanitary drainage unless approved by the municipal sewer
43.16 authority or stated elsewhere in this code.

43.17 Subp. 3. Section 1101.3. UPC section 1101.3 is amended to read as follows:

43.18 **1101.3 Material Uses.** Rainwater piping placed within the interior of a building or run
43.19 within a vent or shaft shall be of cast-iron, galvanized steel, wrought iron, brass, copper,
43.20 lead, Schedule 40 ABS DWV, Schedule 40 PVC DWV, stainless steel 304 or 316L
43.21 [stainless steel 304 pipe and fittings shall not be installed underground and shall be kept
43.22 not less than 6 inches (152 mm) aboveground], or other approved materials, and changes
43.23 in direction shall be in accordance with Section 706.0. ABS and PVC DWV piping
43.24 installations shall be installed in accordance with IS 5 and IS 9.

43.25 Subp. 4. Section 1101.11. UPC section 1101.11 is amended to read as follows:

43.26 **1101.11 Roof Drainage.**

44.1

1101.11.1 Primary Roof Drainage. ^{When} Roof areas of a building ^{are} shall be drained by roof

44.2

~~drains or gutters.~~ ⁺ The location and sizing of drains ^{and} gutters shall be coordinated

44.3

with the structural design and pitch of the roof. ^{the} The roof drainage system shall be

44.4

sized on a basis of a rate of rainfall of at minimum four inches per hour. ^{in accordance with section 1106 or as permitted elsewhere in this code.}

44.5

1101.11.2 Secondary Drainage. Secondary (emergency) roof drainage shall be

44.6

provided in accordance with Minnesota Rules, chapter 1305.

44.7

Subp. 5. Sections 1101.11.2.1, 1101.11.2.2, 1101.2.2 (A), and 1101.11.2.2 (B).

44.8

UPC subsections 1101.11.2.1, 1101.11.2.2, 1101.11.2.2 (A), and 1101.11.2.2 (B) are

44.9

deleted in their entirety.

44.10

4714.1106 SIZE OF LEADERS, CONDUCTORS, AND STORM DRAINS.

44.11

UPC section 1106.3 is amended to read as follows:

44.12

1106.3 Reduction in Size Prohibited. Except for siphonic roof drainage systems, storm

44.13

drain piping shall not reduce in size in the direction of flow, including changes in direction

44.14

from horizontal to vertical.

44.15

4714.1108 CONTROLLED-FLOW ROOF DRAINAGE.

44.16

UPC section 1108 is amended to read as follows:

44.17

1108.0 Controlled-Flow Roof Drainage.

44.18

1108.1 Application. ^{Controlled-flow roof drainage sizing shall be} ~~In lieu of sizing the storm drainage system in accordance with~~

44.19

~~Section 1106.0,~~ the roof drainage shall be permitted to be sized on the basis of controlled

44.20

flow and storage of the storm water on the roof, provided the design is based on a

44.21

minimum of four inches per hour and the following conditions are met:

44.22

(1) The water from a 25-year-frequency storm shall not be stored on the roof ^{for more than} ~~exceeding~~

44.23

24 hours.

44.24

(2) During the storm, the water depth on the roof shall not exceed the depths specified

44.25

in Table 1108.1 (2).

- 45.1 (3) Not less than two drains shall be installed in roof areas of 10,000 square feet (929 m²)
 45.2 or less, and not less than one additional drain shall be installed for each 10,000 square feet
 45.3 (929 m²) of roof area ~~exceeding 10,000 square feet (929 m²)~~. *additional*
- 45.4 (4) Each roof drain shall have a precalibrated, fixed (nonadjustable), and proportional
 45.5 weir (notched) in a standing water collar inside the strainer. No mechanical devices or
 45.6 valves shall be allowed.
- 45.7 (5) Pipe sizing shall be based on the precalibrated rate of flow (gpm) (L/s) of the
 45.8 precalibrated weir for the maximum allowable water depth, and Tables 1101.7 and 1101.11.
- 45.9 (6) The height of stones or other granular material above the waterproofed surface shall
 45.10 not be considered in water depth measurement, and the roof surface in the vicinity of the
 45.11 drain shall not be recessed to create a reservoir.
- 45.12 (7) Roof design, where controlled-flow roof drainage is used, shall be such that the design
 45.13 roof live load is not less than 40 lb/ft².
- 45.14 (8) Scuppers shall be provided in parapet walls. The distance of scupper bottoms above the
 45.15 roof level at the drains shall not exceed the maximum distances specified in Table 1108.1(8).
- 45.16 (9) Scupper openings shall be not less than 4 inches (102 mm) high and have a width equal
 45.17 to the circumference of the roof drain required for the area served, sized in accordance
 45.18 with Table 1101.11.
- 45.19 (10) Flashings shall extend above the top of the scuppers.
- 45.20 (11) At a wall or parapet, 45-degree (0.79 rad) cants shall be installed.
- 45.21 (12) Separate storm and sanitary drainage systems shall be provided within the building.
- 45.22 (13) Calculations for the roof drainage system shall be submitted, along with the plans, to
 45.23 the Authority Having Jurisdiction for approval.

45.24 **4714.1109 TESTING.**

- 45.25 Subpart 1. Section 1109.1. UPC section 1109.1 is amended to read as follows:

46.1 **1109.1 Testing Required.** New building storm drainage systems and parts of existing
 46.2 systems that have been altered, extended, or repaired shall be tested in accordance with
 46.3 section 712 to disclose leaks and defects.

46.4 Subp. 2. Section 1109.2. UPC section 1109.2 is amended to read as follows: *except as provided in section 1109.2. Any section of the building storm sewer that passes through contaminated soils or contaminated water must be air tested in accordance with section 712.3.*

46.5 **1109.2 Exceptions.**

46.6 **1109.2.1** Testing is not required for:

46.7 (1) outside leaders;

46.8 (2) perforated or open drain tile; or

46.9 (3) portions of storm drainage system and sewers *that are* located more than ten feet from
 46.10 buildings, more than ten feet from buried water lines, and more than 50 feet from
 46.11 water wells, and not passing through soil or water identified as being contaminated.

46.12 **1109.2.2** Building storm sewers may be tested in accordance with the Hydrostatic *b that do*
 46.13 Test Method from the City Engineers Association of Minnesota, except that an air *Except for air tests required in section 1109.1,*

46.14 test may be required for any section of the building storm sewer that passes through
 46.15 contaminated soils or contaminated water. The Hydrostatic Test Method, provisions

46.16 F2 and F3, as specified in Standard Utilities Specifications for Watermain and
 46.17 Service Line Installation and Sanitary Sewer and Storm Sewer Installation, written
 46.18 and published by the City Engineers Association of Minnesota, (1999 edition), is *newer edition out - 2013 E2, E3*
 46.19 incorporated by reference, is not subject to frequent change, and is available in the
 46.20 office of the commissioner of labor and industry.

46.21 **4714.1110 SIPHONIC ROOF DRAINAGE SYSTEM.**

46.22 UPC chapter 11 is amended by adding a new section and subsections as follows:

46.23 **1110.0 Siphonic Roof Drainage System.**

46.24 **1110.1 General Requirements.** In lieu of sizing the storm drainage system from
 46.25 conventional methods as required in Section 1106.0, ^{Siphonic} the roof drainage ^{systems} may be designed
 46.26 as an engineered siphonic roof drainage system when allowed by the administrative

47.1 authority. The engineered siphonic roof drainage system must meet the requirements
47.2 of Sections 1110.2 and 1110.3.

47.3 **1110.2 Design Criteria.** The siphonic roof drainage system must be designed and certified
47.4 by a professional engineer licensed in Minnesota.

47.5 ^{^ Sizing.} **1110.2.1** The system must be sized on the basis of a minimum rate of rainfall
47.6 of four inches per hour.

47.7 ^{^ Design.} **1110.2.2** The drainage system must be designed according to ASPE Standard
47.8 45, Siphonic Roof Drainage, and according to the manufacturer's recommendations
47.9 and requirements. Manufacturer design software must be in accordance with ASPE
47.10 Standard 45.

47.11 ^{^ Roof drain bodies.} **1110.2.3** Roof drains must meet ASME A112.6.9, Siphonic Roof Drains.

47.12 ^{^ Water accumulation} **1110.2.4** When designed for water accumulation, the roof must be
47.13 designed for the maximum possible water accumulation according to Section 1108.1

47.14 (7) and Minnesota Rules, chapter 1305.

47.15 ^{^ as amended in this code} **1110.2.5** Minimum pipe size must be 1-1/2 inches. All pipe sizes and cleanouts
47.16 in the drainage system must be designed and installed according to ASPE Standard 45.

47.17 ^{^ Horizontal} **1110.2.6** ^{^ Pipes} Horizontal pipe size must not reduce in the direction of flow.

47.18 ^{^ Plans and specifications} **1110.2.7** The plans and specifications for the drainage system shall indicate
47.19 the siphonic roof drainage system as an engineered method used for the design.

47.20 ^{^ Markings} **1110.2.8** The installed drainage system must be permanently and
47.21 continuously marked as a siphonic roof drainage system at approved intervals and
47.22 clearly at points where piping passes through walls and floors. Roof drains must be
47.23 marked in accordance with ASME A112.6.9.

47.24 ^{^ Transition} **1110.2.9** ^{^ locations} The transition locations from the siphonic roof drainage system
47.25 to a gravity system must be determined by the design engineer at a location

47.26 acceptable
47.27 to the administrative authority. The design, sizing, and venting of the transition
location must be in accordance with ASPE Standard 45. The velocity at the transition

48.1 location to gravity shall be reduced to less than three feet per second. The gravity
 48.2 portion of the building storm sewer system receiving the siphonic roof drainage
 48.3 system must be sized for the design rate but ^{not} ~~no~~ less than a rainfall rate of four inches
 48.4 per hour and in accordance with Section 1106.0.

48.5 **1110.2.10** ^{Required submissions.} ~~All~~ plans, specifications, and calculations must be submitted

48.6 to the administrative authority ~~and~~ signed and sealed by the design engineer. ^{and} The

48.7 submitted calculations must include performance data for the drainage system for
 48.8 the required rainfall rate, including the minimum and maximum calculated operating
 48.9 pressures and velocities verifying that the design solution is within the operating
 48.10 parameters required by the design standard. All performance data must be reported

48.11 as the extreme maximum and minimum calculations and shall not be presented ^{with} ~~with~~

48.12 averaged data.

48.13 **1110.3 Proof of Suitability.** Upon completion of the project, ^{ig} proper tests, inspections,

48.14 and certification of the siphonic roof drainage system must be performed according

48.15 to items 1110.3.1 and 1110.3.2:

48.16 **1110.3.1** ^{Testing.} ~~.....~~ Testing must be performed according to ASPE Standard 45.

48.17 **1110.3.2** ^{Written certification.} ~~.....~~ Prior to the final plumbing inspection, the design engineer must

48.18 provide written certification to the administrative authority that the system has been

48.19 visually inspected by the design engineer and the installation has been properly

48.20 implemented according to the certified design, plans, calculations, and specifications.

48.21 The submitted written certification must include any field modification from the initial

48.22 design involving dimensions, location, or routing of the siphonic roof drainage system

48.23 that must be reapproved and recertified by the design engineer and be accompanied

48.24 by a final as-built design of the altered system and supported by calculated data to

48.25 show that the overall system remains in accordance with ASPE Standard 45.

48.26 **4714.1701 GENERAL.**

48.27 UPC section 1701.1 is amended to read as follows:

49.1 **1701.1 Applicability.** The provisions of this chapter shall apply to the installation,
49.2 construction, alteration, and repair of rainwater catchment systems for nonpotable
49.3 applications listed in Section 1702.1.

49.4 **1701.1.1 Irrigation.** Rainwater catchment systems used for lawn irrigation are not
49.5 covered under this chapter.

49.6 **1701.1.2 Combination Systems.** Rainwater catchment systems used for lawn
49.7 irrigation in combination with any uses listed in Section 1702.1 shall meet the
49.8 requirements of this chapter. The irrigation system shall be separated by an air gap or
49.9 proper backflow protection as required for potable water.

49.10 **4714.1702 NONPOTABLE RAINWATER CATCHMENT SYSTEMS.**

49.11 Subpart 1. **Section 1702.1.** UPC section 1702.1 is amended to read as follows:

49.12 **1702.1 General.** The installation, construction, alteration, and repair of rainwater
49.13 catchment systems intended to supply uses such as water closets, urinals, trap primers for
49.14 floor drains and floor sinks, industrial processes, water features, vehicle washing facilities,
49.15 cooling tower makeup, and similar uses shall be approved by the commissioner.

49.16 Subp. 2. **Section 1702.2.** UPC section 1702.2 is amended to read as follows:

49.17 **1702.2 Plumbing Plan Submission.** No permit for a rainwater catchment system shall
49.18 be issued until complete plumbing plans have been submitted and approved by the
49.19 commissioner in accordance with Minnesota Rules, part 1300.0215, subpart 6.

49.20 Subp. 3. **Section 1702.4.** UPC section 1702.4 is amended to read as follows:

49.21 **1702.4 Connections to Potable or Reclaimed (Recycled) Water Systems.** Rainwater
49.22 catchment systems shall have no direct connection to a potable water supply or alternate
49.23 water source system. Potable or reclaimed (recycled) water is permitted to be used
49.24 as makeup water for a rainwater catchment system provided the potable or reclaimed
49.25 (recycled) water supply connection is protected by an air gap or reduced-pressure principle
49.26 backflow preventer in accordance with this code. An automatic means to supply the

50.1 rainwater catchment system with makeup water shall be installed when there is insufficient
50.2 rainwater to meet the required demand or due to system failure.

50.3 Subp. 4. Section 1702.5. UPC section 1702.5 is amended to read as follows:

50.4 **1702.5 Initial Cross-Connection Test.** Where a portion of a rainwater catchment system
50.5 is installed within a building, a cross-connection test is required in accordance with
50.6 Section 1702.11.2. Before the building is occupied or the system is activated, the plumbing
50.7 contractor shall perform the initial cross-connection test in the presence of the Authority
50.8 Having Jurisdiction. The test shall be ruled successful before final approval is granted.

50.9 Subp. 5. Section 1702.7. UPC section 1702.7 is amended to read as follows:

50.10 **1702.7 Rainwater Catchment System Materials.** Rainwater catchment system materials
50.11 shall comply with Sections 1702.7.1 through 1702.7.4.

50.12 **1702.7.1 Water Supply and Distribution Materials.** Rainwater catchment water
50.13 supply and distribution materials shall comply with Chapter 6 and the requirements
50.14 of this code for potable water supply and distribution systems, unless otherwise
50.15 provided for in this section.

50.16 **1702.7.2 Rainwater Catchment System Drainage Materials.** Materials used in
50.17 rainwater catchment drainage systems, including gutters, downspouts, conductors,
50.18 and leaders shall be in accordance with Chapter 11 and the requirements of this code
50.19 for storm drainage.

50.20 **1702.7.3 Storage Tanks.** Rainwater storage tanks shall comply with Section 1702.9.5.

50.21 **1702.7.4 Collection Surfaces.** The collection surface shall be constructed of a hard,
50.22 impervious material.

50.23 Subp. 6. Section 1702.9. UPC section 1702.9.3 is amended as follows:

50.24 **1702.9.3 Collection Surfaces.** Rainwater shall be collected from roof surfaces.

50.25 Rainwater catchment system shall not collect rainwater from:

50.26 (1) vehicular parking surfaces;

50.13

50.18

50.20

50.24

50.25

as amended in this code

as amended in this code

as amended in this code

catchment systems

rainwater only from

51.1 ~~(2) surface water runoff;~~

51.2 ~~(3)~~ bodies of standing water; or

51.3 ~~(4)~~ similar *A non-roof surfaces*

51.4 **1702.9.3.1 Prohibited Discharges.** Overflows and bleed-off pipes from roof-mounted

51.5 equipment and appliances, condensate, and other waste disposal shall not discharge

51.6 onto roof surfaces that are intended to collect rainwater for harvesting. *for catchment systems*

51.7 Subp. 7. Section 1702.9. UPC section 1702.9.4 is amended as follows:

51.8 **1702.9.4 Minimum Water Quality.** The minimum water quality for harvested

51.9 rainwater shall meet the applicable water quality recommendations in Table 1702.9.4. *catchment systems*

51.10 Subp. 8. Section 1702.9.4. UPC section 1702.9.4 is amended by adding the

51.11 following table:

TABLE 1702.9.4

<u>Measure</u>	<u>Limit</u>
51.13 <u>Turbidity (NTU)</u>	<u><1</u>
51.14 <u>E. coli (MPN/100 mL)</u>	<u>2.2</u>
51.15 <u>Odor</u>	<u>Non-offensive</u>
51.16 <u>Temperature (degrees Celsius)</u>	<u>MR</u>
51.17 <u>Color</u>	<u>MR</u>
51.18 <u>pH</u>	<u>MR</u>

51.20 MR = measured and recorded only

51.21 Treatment:

51.22 Minimum 5 micron absolute filter

51.23 Minimum .5-log inactivation of viruses

51.24 Subp. 9. Section 1702.9.5. UPC section 1702.9.5 is amended as follows:

51.25 **1702.9.5.1 Construction.** Rainwater storage shall be constructed of solid,

51.26 durable materials not subject to excessive corrosion or decay and shall be

51.27 watertight and suitable for rainwater storage.

52.1 Subp. 10. Section 1702.9.5. UPC section 1702.9.5.6 (A) is amended as follows:

52.2 1702.9.5.6 (A) Animals and Insects. Rainwater tank openings shall be protected
52.3 to prevent the entrance of insects, birds, or rodents into the tank and piping
52.4 system. Screen installed on vent pipes, inlets, and overflow pipes shall be
52.5 corrosion-resistant and have an aperture of not greater than 1/16 of an inch (1.6
52.6 mm) and shall be close-fitting.

52.7 Subp. 11. Section 1702.9.5. UPC section 1702.9.5.8 is amended as follows:

52.8 1702.9.5.8 Storage Tank Venting. A vent shall be installed on each tank. The
52.9 vent shall extend from the top of the tank and terminate a minimum of 12
52.10 inches above grade, shall be a minimum of 1-1/2 inches in diameter, and shall
52.11 be turned downward.

52.12 Subp. 12. Section 1702.9.6. UPC section 1702.9.6 is amended as follows:

52.13 1702.9.6 Pumps. Pumps serving rainwater catchment systems shall be listed.
52.14 Pumps supplying water to water closets, urinals, and trap primers shall be capable
52.15 of delivering not less than 15 pounds-force per square inch (psi) (103 kPa) residual
52.16 pressure at the highest and most remote outlet served. Where the water pressure in
52.17 the rainwater supply system within the building exceeds 80 psi (552 kPa), a listed
52.18 pressure-reducing valve reducing the pressure to 80 psi (552 kPa) or less to water
52.19 outlets in the building shall be installed in accordance with this code.

52.20 Subp. 13. Section 1702.9.7. UPC section 1702.9.7 is amended as follows:

52.21 1702.9.7 Roof Drains. Primary and secondary roof drains, ^{2-1 systems} conductors, leaders, and
52.22 gutters shall be designed and installed in accordance with Chapter 11. Secondary roof
52.23 drains shall be ~~alarmed~~. ^{as amended in this code}

equipped with a working alarm

52.24 Subp. 14. Section 1702.9.8. UPC section 1702.9.8 is amended as follows:

52.25 1702.9.8 Water Quality Devices and Equipment. The rainwater ^{catchment} harvesting system
52.26 must include filtration and disinfection to maintain the minimum water quality

53.1 requirements in Table 1702.9.4. At a minimum, a 5-micron absolute filter will be
 53.2 provided along with disinfection to provide a 0.5-log inactivation of viruses. Devices
 53.3 and equipment used to treat rainwater shall be suitable for rainwater harvesting *catchment system*
 53.4 applications, properly designed, sized, and documented for the specific project by a
 53.5 Minnesota registered professional engineer.

53.6 Subp. 15. Sections 1702.9.11 and 1702.9.12. UPC sections 1702.9.11 and 1702.9.12
 53.7 are deleted in their entirety.

53.8 Subp. 16. Section 1702.10. UPC section 1702.10.1 is amended as follows:
 53.9 1702.10.1 Commercial, Industrial, and Institutional Restroom Signs. A sign shall
 53.10 be installed in restrooms in commercial, industrial, and institutional occupancies
 53.11 using nonpotable rainwater for water closets, urinals, or both. Each sign shall
 53.12 contain 1/2 of an inch (12.7 mm) letters of a highly visible color on a contrasting
 53.13 background. The location of the sign(s) shall be such that the sign(s) shall be visible

53.14 to users. ~~The number and location of the signs shall be approved by the Authority~~
 53.15 ^{Each sign} Having jurisdiction and shall contain one of the following texts as determined by
 53.16 the application:

53.17 1702.10.1 (A) TO CONSERVE WATER, THIS BUILDING USES RAINWATER
 53.18 TO FLUSH TOILETS AND URINALS.

53.19 1702.10.1 (B) TO CONSERVE WATER, THIS BUILDING USES RAINWATER
 53.20 TO FLUSH TOILETS.

53.21 1702.10.1 (C) TO CONSERVE WATER, THIS BUILDING USES RAINWATER
 53.22 TO FLUSH URINALS.

53.23 1702.10.1 (D) TO CONSERVE WATER, THIS BUILDING USES RAINWATER
 53.24 TO * _____ *

53.25 * _____ * shall indicate the rainwater usage.

53.26 Subp. 17. Section 1702.11. UPC section 1702.11.2 is amended as follows:

54.1 **1702.11.2 Cross-Connection Inspection and Testing.** An initial and subsequent
 54.2 annual inspection and test in accordance with Section 1702.5 shall be performed on
 54.3 both the potable and rainwater catchment water systems. The potable and rainwater
 54.4 catchment water systems shall be isolated from each other and independently
 54.5 inspected and tested to ensure there is no cross-connection in accordance with
 54.6 Sections 1702.11.2.1 through 1702.11.2.4.

54.7 **1702.11.2.1 Visual System Inspection.** Prior to commencing the
 54.8 cross-connection testing, a dual system inspection shall be conducted as follows:

54.9 Pumps, equipment, equipment ^{and annually thereafter} room signs, and exposed piping in an equipment
 54.10 room shall be checked ^{for proper operation and damage}.

54.11 **1702.11.2.2 Cross-Connection Test.** ^{visually inspected} The procedure for determining
 54.12 ~~cross-connection~~ shall be followed by the plumbing contractor in the presence
 54.13 of the Authority Having Jurisdiction to determine whether a cross-connection
 54.14 has occurred ~~as follows:~~

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

54.17 (2) The potable water system shall remain pressurized for a ~~minimum time~~
 54.18 ~~specified by the Authority Having Jurisdiction~~ while the rainwater catchment
 54.19 water system is ^{completely drained} empty. The minimum period the rainwater catchment water
 54.20 system is to remain ^{completely drained} depressurized shall be determined ^{based on} on a case-by-case basis,
 54.21 ~~taking into account~~ the size and complexity of the potable and rainwater catchment
 54.22 water distribution systems, ^{water system} but in no case shall that period be less than one hour.

54.23 (3) Fixtures, potable ^{water} and rainwater, shall be tested and inspected for flow. Flow
 54.24 from a rainwater catchment water system outlet shall ^s indicate a cross-connection.

54.25 No flow from a potable water outlet shall ^s indicate that it is connected to the
 54.26 rainwater catchment water system.

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

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

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

55.5 (7) The rainwater catchment water system shall remain pressurized for a
55.6 minimum time specified by the Authority Having Jurisdiction while the potable

55.7 water system is empty. The minimum period the potable water system is to

55.8 remain depressurized shall be determined on a case-by-case basis, but in no case ^{based on the size and complexity of} the potable

55.9 shall that period be less than one hour.

55.10 (8) Fixtures, potable and rainwater catchment, shall be tested and inspected for

55.11 flow. Flow from a potable water system outlet shall indicate a cross-connection.

55.12 No flow from a rainwater catchment water outlet shall indicate that it is connected

55.13 to the potable water system.

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

55.16 (10) Where there is no flow detected in the fixtures that would indicate a
55.17 cross-connection, the potable water system shall be repressurized.

55.18 **1702.11.2.3 Discovery of Cross-Connection.** In the event that a cross-connection
55.19 is discovered, the following procedure, in the presence of the Authority Having
55.20 Jurisdiction, shall be activated immediately:

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

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

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

55.25 (4) The building shall be retested following procedures listed in Sections

55.26 1702.11.2.1 and 1702.11.2.2.

56.1

(5) The potable water system shall be ^{disinfected in accordance} chlorinated with 50 ppm chlorine for 24

56.2

~~hours.~~ with section 609.9.

56.3

~~(6) The potable water system shall be flushed after 24 hours, and a standard~~

56.4

~~bacteriological test shall be performed. Where test results are acceptable, the~~

56.5

~~potable water system shall be permitted to be recharged.~~

56.6

1702.11.2.4 Annual Inspection. An annual inspection of the rainwater

56.7

catchment water system, following the procedures in Section 1702.11.2.1, shall

56.8

be required. Cross-connection testing, following the procedures listed in Section

56.9

1702.11.2.2, shall be required every five years.

56.10

Alternate testing requirements shall be permitted by the Authority Having

56.11

Jurisdiction.

56.12

Subp. 18. Section 1702. UPC section 1702 is amended by adding the following

56.13

section:

56.14

1702.12 Maintenance and Inspection. Rainwater catchment water systems and

56.15

components shall be inspected and maintained in accordance with Sections 1702.12.1

56.16

through 1702.12.3.

56.17

1702.12.1 Frequency. Rainwater catchment systems and components shall be

56.18

inspected and maintained in accordance with Table ^{1702.12} ~~1701.5~~ unless more frequent

56.19

inspection and maintenance is required by the manufacturer.

56.20

1702.12.2 Maintenance Log. A maintenance log for rainwater catchment systems is

56.21

required. The property owner or designated appointee shall ensure that a record of

56.22

testing, inspection, and maintenance in accordance with Table 1702.12 is maintained

56.23

in the log. The log will indicate the frequency of inspection and maintenance for

56.24

each system.

56.25

1702.12.3 Maintenance Responsibility. The required operation, maintenance,

56.26

monitoring, testing, and inspection of rainwater catchment systems shall be the

56.27

responsibility of the property owner.

57.1 Subp. 19. Section 1702.12. UPC section 1702.12 is amended by adding the
 57.2 following table:

57.3 **TABLE 1702.12**

57.4 **Minimum Alternate Water Source Testing, Inspection, and Maintenance Frequency**

57.5 <u>Description</u>	57.5 <u>Minimum Frequency</u>
57.6 <u>Inspect and clean filters and screens, and replace.</u>	<u>Every three months.</u>
57.7 <u>Inspect and verify that required disinfection, filters,</u>	<u>After initial installation and</u>
57.8 <u>and water quality treatment devices and systems</u>	<u>monthly thereafter.</u>
57.9 <u>that are operational and maintaining minimum water</u>	<u>Exception: Every 12 months</u>
57.10 <u>quality requirements in Table 1702.9.4.</u>	<u>thereafter when electronically</u>
57.11	<u>monitored.</u>
57.12 <u>Inspect and clear debris from rainwater gutters,</u>	<u>At the beginning of seasonal</u>
57.13 <u>downspouts, and roof washers.</u>	<u>usage and monthly during</u>
57.14	<u>seasonal usage.</u>
57.15 <u>Inspect and clear debris from roof or other aboveground</u>	<u>At the beginning of seasonal</u>
57.16 <u>rainwater collection surfaces.</u>	<u>usage and monthly during</u>
57.17	<u>seasonal usage.</u>
57.18 <u>Remove tree branches and vegetation overhanging roof</u>	<u>As needed.</u>
57.19 <u>or other aboveground rainwater collection surfaces.</u>	
57.20 <u>Inspect pumps and verify operation.</u>	<u>After initial installation and every</u>
57.21	<u>12 months thereafter.</u>
57.22 <u>Inspect valves and verify operation.</u>	<u>After initial installation and every</u>
57.23	<u>12 months thereafter.</u>
57.24 <u>Inspect pressure tanks and verify operation.</u>	<u>After initial installation and every</u>
57.25	<u>12 months thereafter.</u>
57.26 <u>Clear debris from and inspect storage tanks and</u>	<u>After initial installation and every</u>
57.27 <u>locking devices and verify operation.</u>	<u>12 months thereafter.</u>
57.28 <u>Inspect caution labels and marking.</u>	<u>After initial installation and every</u>
57.29	<u>12 months thereafter.</u>
57.30 <u>Cross-connection inspection and test.*</u>	<u>After initial installation and</u>
57.31	<u>every 12 months thereafter in</u>
57.32	<u>accordance with Section 1702.11.</u>

57.33 *The cross-connection test shall be performed in accordance with this chapter by a plumber
 57.34 licensed under Minnesota Statutes, section 326B.46, and certified to ASSE Standard 5120.

58.1 Subp. 20. Section 1702. UPC section 1702 is amended by adding a section as follows:

58.2 **1702.13 Operation and Maintenance Manual.** An operation and maintenance manual
58.3 for rainwater systems shall be supplied to the building owner by the system designer. The
58.4 operating and maintenance manual shall include the following:

58.5 (1) Detailed diagram of the entire system and the location of system components.

58.6 (2) Instructions on operating and maintaining the system.

58.7 (3) Details on maintaining the required water quality in Table 1702.9.4.

58.8 (4) Details on deactivating the system for maintenance, repair, or other purposes.

58.9 (5) Applicable testing, inspection, and maintenance frequencies in accordance with Table
58.10 1702.12.

58.11 (6) A method of contacting the manufacturer(s).

58.12 Subp. 21. Section 1702. UPC section 1702 is amended by adding the following
58.13 section:

58.14 **1702.14 Separation Requirements.** All underground rainwater service piping shall be
58.15 separated from the building sewer in accordance with Section 609.2. Treated nonpotable
58.16 water pipes shall be permitted to be run or laid in the same trench as potable water pipes
58.17 with a 12-inch minimum vertical and horizontal separation when both pipe materials are
58.18 approved for use within a building. Where horizontal piping materials do not meet this
58.19 requirement, the minimum separation shall be increased to 60 inches. The potable water
58.20 piping shall be installed at an elevation above the treated-nonpotable water piping.

58.21 Subp. 22. Section 1702. UPC section 1702 is amended by adding the following
58.22 section:

58.23 **1702.15 Abandonment.** All rainwater systems that are no longer in use ^{catchment} or fail to be

58.24 maintained in accordance with Section 1702.12 shall be abandoned. Abandonment shall

58.25 comply with Sections 1702.15.1 and 1702.15.2.

and
need
considered
rainwater catchment systems are subject to

59.1 **1702.15.1 General.** Every abandoned system or part thereof covered under the scope
 59.2 of this chapter shall be disconnected from any remaining systems, drained, plugged,
 59.3 and capped per the requirements of this code. *as amended in this code,*

59.4 **1702.15.2 Underground Tank.** Every underground water storage tank that has been
 59.5 abandoned or otherwise discontinued from use in a system covered under the scope of
 59.6 this chapter shall be completely drained and filled with earth, sand, gravel, or concrete
 59.7 or removed in a manner satisfactory to the administrative authority. *as amended in this code,*

approved by

Chapter 4715 repealer.

TABLE 721.1

MINIMUM HORIZONTAL DISTANCE REQUIRED FROM BUILDING SEWER (feet)

<u>Water supply wells</u>	<u>See M.R. Chapter 4725¹</u>
<u>Water service line</u>	<u>10²</u>

For SI units: 1 foot = 304.8 mm

Notes:

¹ The minimum horizontal setback distance between a building sewer and a water supply well is governed by Minnesota Rules, Chapter 4725.

² Unless otherwise permitted by the Administrative Authority and when installed in accordance with Section 720.0.

SONAR: UPC Table 721.1

The UPC Table 721.1 is amended to reflect Minnesota specific requirements for minimum horizontal distance required or minimum setback distance required from building sewers. Several proposed changes in the table are made and some rows in the table are proposed for deletion, as well as the associated footnotes. The footnotes are also renumbered accordingly to reflect the deletion of notes.

Separation of building sewers from buildings and structures are not necessary or of health and safety concerns and do not need to be addressed, and therefore, are needed to be removed from the table. If not removed, the building sewer separation requirement from structures (decks, porches, etc) will not be enforceable and create hardship on officials and inspectors to administer. Often some structures are installed after building sewers are buried, and by providing the separation does not add any benefits or gain on health and safety.

Separation of building sewer from property line adjoining private property is also deleted from this table. UPC Table 721.1 requires building sewer to have “clear” minimum horizontal distance from property line adjoining private property. This is necessary since the use of the term “clear” is not enforceable and in the context of how it’s use for separation has no clear technical meaning. In addition, similar requirement has been addressed in UPC section 721.0 for building sewers and UPC 311.0 as amended has requirement for every building to have independent connection to municipal sewer or private sewer.

Specific minimum horizontal distance from water supply wells of 50 feet has been amended to refer to the governing Minnesota Rules, Chapter 4725, which establishes the required distances from building sewers. This is necessary to ensure the most up to date and correct distances are used by the proper state rule, rather than in this table where the distance may no longer be applicable over time and will cause improper installation distance.

Separation of building sewer from streams or water bodies is proposed for deletion from this table since there are no specific requirement on the minimum horizontal distance required from the rules that governed streams or water bodies administered by the MN Department of Natural Resource (DNR). This distance is reviewed with DNR staff along with Minnesota Rules, Chapter 6120 and Chapter 1335 prior to making the recommendation to delete from the Table and was also supported by DNR staff. Therefore, this proposed deletion is necessary to avoid confusion to a distance that is not established by state rules or by rules that are governed by another state agency.

Furthermore, the row labeled “On-site domestic water service line” has been renamed to “Water supply service lines” to provide clarify that means the water service line to a building, and also provides consistency with the UPC. This is necessary as the use of the word “domestic water service” is not define in the UPC and is often miss-understood as water supply lines to a home or family, which is not an accurate use of the term as domestic water service lines also serve commercial and public buildings as well as homes.

Additional changes also includes the minimum horizontal distance of building sewer from domestic water service line is from 1 foot to 10 feet. This proposed change provides increased protection of the water service line from any building sewer piping where (1) building sewer material is not approved for use within the building and (2) where materials proposed are not approved materials for use within a building and all the conditions of Section 720.0 Items (1), (2), (3) are not possible. The exception in foot note 2 is given to the Administrative Authority to provide allowance on having water lines and sewers be laid in the same trench in accordance with UPC section 720.0 for the appropriate application to avoid improper installation and comprising the protection of the water supply. This is necessary since soil conditions and soil contamination vary from one location to the next and only the local authorities are familiar with localized soil conditions including possible contaminated soil areas. The proposed 10 feet horizontal separation establishes a level of construction standard to protect potable water.

“Public water main” is also proposed for deletion since the authority having jurisdiction for rules and regulations of public water main is Minnesota Department of Health, and the Plumbing Board. Therefore, it is reasonable to remove this distance from the UPC table.

DRAFT

Defense of the UPC Single Wall Heat Exchanger Language

The proposed UPC single wall specification revision offers a more technically achievable provision for single wall heat exchangers than the current MN code. However, the added expense of the RPZ installation, annual testing, and the inconvenience to homeowners, offsets a majority of the energy and cost savings opportunity, making the installation of single wall exchanger solutions impractical and economically unfeasible for most applications. The result will be far less indirect water heaters, combi heating units, and solar thermal installations in the state than there could be; thus depriving homeowners of some of the most innovative and efficient water heating alternatives, and the State of Minnesota of an opportunity to significantly lower our carbon emissions.

I will discuss below why single wall exchanger devices are important, and quantify the energy savings potential and corresponding environmental benefits that these devices can provide. I will also take a closer look at the elements of the UPC single wall code as it is currently written and illustrate how the unamended code is very effective at protecting the health of the citizens to whom it applies. At the same time it provides a safe, practical balance that provides an opportunity for energy savings and environmental benefits, and application advantages that single wall equipment provides.

Why single wall heat exchanger devices are important.

Indirect water heaters, combination "combi" heating units, and solar thermal systems save energy when compared to conventional tank style and tankless water heaters. They have lower operating costs, conserve energy, and are a greener solution for the environment.

Indirect Water Heaters

Today's indirect water heaters are very durable and dependable pieces of equipment with industry standard lifetime warranties. Tanks and exchangers are generally made from robust, corrosion resistant materials such as SST, Cupronickel and engineered polymers. Tanks that meet the UPC code requirements are tested to working pressures of 300psi and manufactured to ASME or *iS* 191 standards.

Water heating requires the second largest demand for energy in a home after heating and cooling. As such, it offers one of the best opportunities for energy savings. Adding an indirect water heater to an existing boiler is an effective way to reduce the energy required for DHW production. Indirect water heaters are paired with boilers typically ranging from 80% AFUE to 98% AFUE, yielding combined annual efficiency rates of .86 plus. This compares to a typical combustion efficiency of a conventional gas water heater with burner in the 70% - 80% range with large stand by losses up the flue, yielding an EF of .60. Pairing high efficient condensing boilers with well insulated indirect tanks results in superior combustion efficiencies and stand by losses as low as 1°F per hour. Typical annual savings from a boiler/indirect relative to a conventional gas water heater are in the \$200 range. Savings over electric water heaters are

closer to the \$400 annual range. Installation cost of a residential single wall indirect water heater with an existing boiler is around \$2000 . This provides a 5-10 year payback; a reasonable return on a piece of equipment with a lifetime warranty. In addition to energy savings, single wall indirect heaters can produce hot water 2-5 times faster than a comparably sized conventional gas or electric heater.

An estimated 120,000 homes in MN currently have gas boilers installed. Based on industry data, approximately 3300 boilers are replaced in MN annually and another 1500 are installed in new installations. Assuming 80% of those homes with boilers currently have conventional water heaters, there are 96,000 homes with boilers that could add indirect water heaters. The typical installed mix is 60% gas, 40% elect, therefore, we can use a conservative weighted average energy savings of \$280 per year per home. The total annual energy saving opportunity becomes 96,000 homes x \$280 = \$26,880,000 annually.

Burning that much less gas and coal (for electrical generation) means that we could reduce statewide CO₂ emissions by 250,000 tons. One ton of CO₂ reduction is the equivalent of planting 140 trees. This reduction would be the equivalent of 70,000,000 trees. This sort of environmental benefit opportunity is consistent with direction from the governor to look for ways that our industry can be greener.

The industry manufacturers track the total number of indirect water heaters sold into different markets in the US. Last year there were 77,000 sold throughout the US. 302 were sold in MN. By contrast 1700 were sold in WI. That is hard data showing the current code requiring double wall exchangers makes the products less viable in MN. The extra costs associated with an RPZ installation will ensure that Minnesotans continue to miss out on energy savings and application benefits that the products provide.

Combination (Combi) Heating and Hot Water Devices

There has been a tremendous amount of innovation in the area of hydronic heating and DHW generation devices. Manufacturers are finding creative ways to combine the functionality of gas and electric boilers, hydro air, indirect DHW, tankless water heaters, solar thermal, air source heat pumps, geothermal, ventilation, and biomass boilers. The results of this innovation include efficiency improvements, enhanced comfort, space savings, cost savings, and environmental benefits. The new products are evolving from multiple directions, but one common aspect is they incorporate multiple types of heat exchangers. These exchangers often function to trade energy between space heating and DHW heating devices.

One example of such a device is the Matrix from NTI. It combines hydronic heat, DHW, hydro air heat, cooling and an HRV all in a single piece of equipment. The Matrix uses a brazed plate exchanger for its DHW generation. Another example is the Versa-Hydro Solar from HTP. The Versa-Hydro is a tank style modulating, condensing water heater with a brazed plate exchanger for supplying radiant heat, auxiliary ports for open loop hydro air handler, and a heat exchanger coil at the bottom of the tank for charging the tank with energy from solar thermal panels or a wood boiler. The common denominator with these and nearly 75 other combi devices on the market from over a dozen manufacturers is that they are only available with single wall heat exchangers.

Solar Thermal Systems

Solar thermal options offer the potential for a near zero energy cost and a corresponding reduced carbon footprint. However, the high cost of the system, even with 30% federal tax credit incentives, makes it difficult to justify economically. Solar thermal heating is most often applied to DHW systems because they have a year round demand. The extra cost of DW heat exchangers or RPZs, makes Solar that much more difficult to justify financially.

Effectiveness of Single Wall vs. Double Wall Heat Exchangers

SW heat exchangers are, in general, much more effective at transferring heat than DW exchangers. Heat transfer takes place across a single layer of material rather than across two layers with an insulating air gap in between. In some cases, manufacturers oversize the DW heat exchangers to increase surface area and compensate for the reduced efficiency in an effort to improve the performance. Extending the length of the coil results in that need for larger circulators and more pumping energy to overcome the additional head loss and still achieve the required flow. In either case, DW heat exchangers are more costly from an install perspective, and/or operate.

As an example, a 45 gal single wall heat exchanger from one manufacturer will provide up to 141 gal of 140F water in the first hour. The 45 gal DW version yields only 70 gal at 140F in the first hour. The consumer cost of the DW is \$600 (50%) more. To achieve similar performance with the DW, the cost would be \$1900 higher

There are several reasons that DW heat exchanger HVAC devices tend to be significantly more expensive than similar SW devices.

1. DW exchangers are more expensive to manufacture because they require more complex processes and more material.
2. Manufacturers must make the DW heat exchangers larger with more surface area to compensate for the lower heat transfer rates across the two layers and insulating air gap.
3. The DW market is very small relative to the SW market. According to equipment manufacturers, Minnesota has the only additional state wide restriction on the use of single wall heat exchangers. As a result, in the rare case when a manufacturer does decide to offer a device in a DW version, the production volume is comparatively much lower, resulting in higher product costs.

The bottom line is that the extra cost and reduced performance of the DW exchangers makes them difficult to justify economically from an application perspective. There is a strong argument that in reality, double wall exchangers provide little or no additional safe guards relative to single wall. I've had conversations with several plumbers who have stated that, in their experience, leaks in DW systems often show themselves the same way as they would in a SW system. More often than not, if a leak develops in a DW exchanger, it starts small and ends up calcifying up the air gap and plugging the weep hole between the heat exchanger walls. It isn't recognized until the inner wall of the exchanger fails as well, which results in

the relief valve blowing on the boiler. To that point, the most popular DW indirect on the market has a combined exchanger wall thickness less than most of the SW exchangers.

The cost to install an RPZ can range from several hundred to several thousand dollars. A typical charge for the required annual testing is \$120 plus the city permitting fee, which ranges from 0 - \$80 in the metro area; thus adding an annual maintenance expense for a homeowner of \$120 to \$200. The extra installation and maintenance expenses combined with the inconvenience of scheduling and hosting the testing service is a significant disincentive for someone interested in investing in equipment. In most cases, the average annual maintenance cost offsets the majority of the energy savings making it impossible to justify the installation financially. Restricting or adding additional expense to the installation of SW device installations deprives Minnesotans of the opportunity to conserve \$26 million dollars of energy, and eliminating 250 thousand tons of CO₂ into the environment of our state.

The existing UPC single wall code is effective

The UPC single wall code effectively addresses the proper and safe use of SW exchangers. A team of very capable industry professionals put a lot of thought, concern and hard work into creating the UPC single wall code language. Questions and concerns have been thoroughly researched and thoughtfully addressed. One of the individuals with input into that process was Paul Soler, Chief Engineer for Crown Boiler. I have known Paul for over a decade and can attest that he is one of the most conscientious, and conservative individuals in our industry. As an example, Paul vetoed the use of PVC venting material for Crown's first condensing boilers because he was not comfortable with it. Even though all of his competitors were allowing PVC, Crown required much more expensive stainless steel. That decision dramatically affected product sales but Paul stuck to his guns. The current language of the UPC single wall code was adopted around 2007 as a rational balance of safety and practicality.

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.

603.5.4.1 Single-Wall Heat Exchanger. Installation of a single-wall heat exchanger shall meet all of the following requirements:

Pressure Differential

- (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.

A typical residential boiler's pressures range between 10 and 20 psi. Domestic water systems have normal pressures much greater than 30psi. The requirement that the maximum of a 30lb relief valve be installed on the boiler side ensures that if there is a heat exchanger leak, under normal circumstances, water from the higher pressure domestic side will be forced in to the boiler system side. This results in the relief valve for the boiler blowing fluid onto the floor of the boiler room, providing a dramatic visual and audible alarm for the occupants. In unlikely event that the domestic pressure drops below 30psi in the domestic side,

while there is an unnoticed leak on the SW exchanger, the provision that the boiler be filled with nontoxic fluid and labeled as such ensures that the integrity of the domestic water supply is maintained.

Non-toxic Heat Transfer Fluid

(2) Heater transfer medium is either potable water or contains fluids having a toxicity rating or Class of 1.

The statement in the code that "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" could not be more definitive.

Labeling

(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.

The UPC clearly calls out the verbiage for the label that has become a standard on all indirect water heaters sold in the US. The UPC language even goes so far as to specify the size of the text and spacing of the lines. The reference is listed for the Class 1 material list. Anyone who does not care to take the initiative to research the Class 1 alternatives can simply default to potable water.

To fail beyond the safe guards of the current UPC code would require that a statically implausible sequence of events:

As discussed earlier, a leak in a SW exchanger between a boiler and DHW system will result in the boiler's 30lb relief valve blowing a steady volume of water onto the boiler room. For the heat transfer fluid to move into the domestic side, a leak in would have to develop in the heat exchanger simultaneous to a freakish pressure drop in the domestic system.

For the backflow to be a health issue, someone at that same address would have had to ignore the prominent label on the tank, industry norms, and common sense and fill refill the system with a *toxic* fluid. One could argue that the sort of person who would do that has already demonstrated they aren't concerned about following codes and will install whatever they see fit.

Additionally, unnoticed exchanger leak simultaneous with the freakish pressure differential would have to exist long enough to pull a sufficient amount of heat transfer fluid into the water supply to be at a toxic concentration.

It is logical to argue that the probability of all of these events happening simultaneously is very small.

Below is a reasonable attempt at quantifying that probability. Each of the assumptions could be debated in either direction. Doubling, tripling, or even increasing or decreasing any of them by a factor of 10, however, yields the same conclusion. That is that the UPC single wall exchanger code as written does a very good job of protecting the public.

Probability of Harmful Heat Exchanger Failure Incident

Failure rate of heat exchangers - units/100	3	3%
Domestic pressure < Boiler - Hrs/Yr	4	0.0457%
Toxic Fluid in boiler with indirect despite warning label Installations/1000	5	0.5%
% of time a negative pressure leak results in enough cross contamination to be harmful	25	25%
Probability of an Incident that causes harm		0.0000000171
Percent of time the UPC constraints have the intended result		99.9999983%

There are very few situations in life where we can't, with enough imagination, come up with a doom's day scenario. The fact that there are no documented instances a single person in this country of 300 million people being ever harmed in the above fashion is the best evidence of all that the UPC single wall code serves its purpose as written. To add the additional RPZ requirement to single wall heat exchanger usage, adds unnecessary constraints to Minnesota's citizens, environment, and economy.

UPC CURRENT CODE LANGUAGE WITH PROPOSED AMMENDMENT

4715.0603 CROSS-CONNECTION CONTROL

Subp. 1. Section 603.2. UPC section 603.2 is amended to read as follows:

603.2 Approval of Devices or Assemblies. Before a device or an assembly is installed for the prevention of backflow, it shall have first been approved by the Authority Having Jurisdiction. Devices or assemblies shall be tested in accordance with recognized standards or other standards acceptable to the Authority Having Jurisdiction. Backflow prevention devices and assemblies shall comply with Table 603.2, except for specific applications and provisions as stated in Section 603.5.1 through Section 603.5.21.

Devices or assemblies installed in a potable water supply system for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices or assemblies. Such devices or assemblies shall be tested at the time of installation, repair, or relocation and not less than on an annual schedule thereafter, or more often where required by the Authority Having Jurisdiction. Where found to be defective or inoperative, the device or assembly shall be repaired or replaced. No device or assembly shall be removed from use or relocated or other device or assembly substituted, without the approval of the Authority Having Jurisdiction.

Testing shall be performed by a certified backflow assembly tester in accordance with ASSE Series 5000.

Subp. 2. Section 603.5.4. UPC section 603.5.4 is amended to read as follows:

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.

603.5.4.1 Single-Wall Heat Exchanger. 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) Heat-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 toxicity 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 fast 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.