REVISED AGENDA

UNIFORM BUILDING CODE COMMISSION
PLUMBING /HEALTH ADVISORY COMMITTEE

June 4, 2015 9:00 AM

Heber M Wells Bldg
North Conference Room
160 E 300 S Salt Lake City, UT
This agenda is subject to change up to 24 hours prior to the meeting.

ADMINISTRATIVE BUSINESS:

Sign attendance sheet

1. Approval of the May 7, 2015 minutes

DISCUSSION ITEMS:

2. Discuss Section 312.10.3
3. Review proposed changes to Chapter 13 & 14
4. Review proposed amendment to IBC [P] Table 2902.1
5. Complete review of 2015 IPC and plumbing section of IRC
6. Review all plumbing recommendations made to Title 15A

Info Items:

a. IPC Amendment status log

Next Scheduled Meeting: July 3, 2015
Please call Sharon at 530-6163 or email ssmalley@utah.gov if you do not plan on attending.

In compliance with the Americans with Disabilities Act, individuals needing special accommodations (including auxiliary communicative aids and services) during this meeting should notify Dave Taylor, ADA Coordinator, at least three working days prior to the meeting.
Division of Occupational and Professional Licensing, 160 East 300 South, Salt Lake City UT 84115, Phone 530-6628 or toll-free in Utah onlv 866-275-3675.

UTAH DEPARTMENT OF COMMERCE
DIVISION OF OCCUPATIONAL AND PROFESSIONAL LICENSING
160 East 300 South Salt Lake City UT 84111
PO Box 146741 Salt Lake City UT 84114-6741
E-mail: dansjones@utah.gov
Web www.dopl.utah.gov

REQUEST FOR CODE AMENDMENT

Requesting Agency/Person: Alithia Zamantakis	Date: May 26, 2015
Street Address: 1591 S Foothill Dr., #41	
City, State, Zip Salt Lake City, UT 84108	
Contact Person: Alithia Zamantakis	Phone: (435)820-8008
Code to be Amended: (Include edition)	
Section:	
Section Title:	

AMENDMENT:

Type proposed amendment in rule change form. (Using strikeout on portions being removed and underline on all new wording.)

1. Include the entire section you wish to amend.
2. Attach additional sheets if necessary.

Included on separate, attached sheet.

RECEIVED

MAY 29 2015

DIVISION OF OCCUPATIONAL & PROFESSIONAL LICENSING

Purpose of or Reason for the amendment:

To ensure that bathroom spaces exist for folks with families, folks with disabilities, and/or transgender folks.

Cost or Savings Impact of Amendment:

N/A

Compliance Costs for Affected Persons (APerson@ means any individual, partnership, corporation, association, governmental entity, or public or private organization of any character other than an agency.) (You must break out the impact cost to State Budget, Local Government and you must state aggregate cost to other persons {cost per person times number of persons affected}):

None.

Signature: Alithia Zotch	Date: May 26, 2015

For Division Use:

Date Received:	
Committee Action: ☐ Approved ☐ Denied ☐ Approved with revisions ☐ Referred to: ☐ Tabled	**UBC Commission Decision for Hearing:** ☐ Approved for hearing ☐ Denied ☐ Approved with revisions ☐ Referred to: ☐ Tabled
Date Filed:	Public Hearing Date:
UBC Commission Decision for Adoption: ☐ Approved ☐ Denied ☐ Approved with revisions ☐ Referred to: ☐ Tabled	Effective Date:

15A-3-112 Amendments to Chapters 29 through 31 of IBC.

(1) In IBC [P] Table 2902.1 the following changes are made:

(a) The title for [P] Table 2902.1 is deleted and replaced with the following: "[P] Table 2902.1,

Minimum Number of Required Plumbing Facilities a, h".

(b) In the row for "E" occupancy in the field for "OTHER" a new footnote i is added.

(c) In the row for "I-4" occupancy in the field for "OTHER" a new footnote i is added.

(d) A new footnote h is added as follows: "FOOTNOTE: h. When provided, in public toilet facilities there shall be an equal number of diaper changing facilities in male toilet rooms and female toilet rooms."

(e) A new footnote i is added to the table as follows: "FOOTNOTE i:

Non-residential child

care facilities shall comply with additional sink requirements of Utah Administrative Code R430-100-4."

(f) A new footnote j is added to the table as follows: "FOOTNOTE: j. Family, Gender-Neutral, Gender-Free, Unisex, and All-Gender restrooms may be counted towards the required number of male/female bathrooms within public buildings."

IPC AMENDMENT STATUS LOG
PENDING
G:\Commission\plumbhlth\009

Section to Amend	Proponent & Agency	Approved/Denied by Committee	Commission Appr/Deny for Hearing	PUBLIC HEARING	BUSINESS & LABOR INTERIM		Effective Date
IPC 605.2 IRC 2905.2	Murray City Gilbert Gonzales	5-1-14 denied	6-11-14 denied				
312	Jeff Park	5-1-14 approved	6-11-14 approved	9-10-14	10-15-14		
307.5		8-7-14 committee approved the deletion of new section					
403.1		9-4-14 modify					
412.5		9-4-14 modify					
502.4		9-4-14 modify					
608.1.2 & 608.1.3	Michael Moss	12-4-14 approved					
314.2.4.1 and .2	Ray Moore	Tabled No changes recommended 5-7-15					
1002.1, .3 and .4 15A-3-314	Plumb-Tech Design	1-8-15 tabled 2-5-15 denied					
705.11.2	Kevin Bell	5-7-15 denied Stay with current wording					
802.1.1	Committee	4-2-15 approved					
608.16.7	Ron Lord	Denied 5-7-15					
IBC Table [P] 2902.1	Alithia Zamantakis						

AGENDA

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PLUMBING /HEALTH ADVISORY COMMITTEE

June 4, 2015 9:00 AM

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Sign attendance sheet

1. Approval of the May 7, 2015 minutes

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2. Discuss Section 312.10.3
3. Review proposed changes to Chapter 13 & 14
4. Complete review of 2015 IPC and plumbing section of IRC
5. Review all plumbing recommendations made to Title 15A

Info Items:

a. IPC Amendment status log

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Please call Sharon at 530-6163 or email ssmalley@utah.gov if you do not plan on attending.

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Division of Occupational and Professional Licensing, 160 East 300 South, Salt Lake City UT 84115, Phone 530-6628 or toll-free in Utah only 866-275-3675.

MINUTES

UNIFORM BUILDING CODE COMMISSION
PLUMBING /HEALTH ADVISORY COMMITTEE
MEETING

May 7, 2015

North Conference Room – 9:00 am
Heber M Wells Building
160 E 300 S
Salt Lake City, Utah

STAFF:
Sharon Smalley, Secretary

COMMITTEE MEMBERS:

Kerry Cramer	Nelson Hooton
Jody Hilton	Jeffrey Park
Robert Patterson (absent)	Ray Moore
Michael Moss	Kevin Bell (absent)

VISITORS:

MINUTES	A motion was made by Jody Hilton to approve the minutes from the April 2, 2015 meeting as written. The motion was seconded by Michael Moss and passed unanimously.
REVIEW PROPOSED AMENDMENTS TO SECTION 314.2.4.1 AND 314.2.4.2	Ray Moore recommended that no changes be made to this section.
REVIEW CURRENT AMENDMENTS TO SECTIONS 608.13.9 AND 608.16.7	The committee reviewed the current amendment and the proposed amendment. Following the discussion, a motion was made by Jody Hilton to keep the current amendment. The motion was seconded by Kerry Cramer and passed unanimously. A motion was made by Kerry Cramer to deny the proposed amendment for Section 608.16.7. The motion was seconded by Jody Hilton and passed unanimously.
REVIEW PROPOSED AMENDMENT TO SECTION 705.11.2	A motion was made by Jody Hilton to deny the proposed amendment. The motion was seconded by Kerry Cramer and passed unanimously.

REVIEW SECTION 708.1.10 AND 708.11.2	The committee reviewed this section of the code. No recommendations were made.
REVIEW CURRENT AMENDMENT FOR SECTION 1002.4	Following a review of this amendment a motion was made by Jody Hilton to delete the current amendment. The motion was seconded by Kerry Cramer and passed unanimously.
COMPLETE REVIEW OF 2015 IPC AND CURRENT AMENDMENTS	The committee completed their review of the 2015 IPC and the current amendments. The following recommendations were made: During the review of Section 1106.1, a motion was made by Michael Moss to add an amendment that would be a subsection numbered as 1106.1.1 and stating, "Alternate Methods. Approved alternate storm drain sizing methods may be allowed.". The motion was seconded by Jody Hilton and passed unanimously. A motion was made by Michael Moss to delete the current amendment for Section 1104.2. The motion was seconded by Jody Hilton and passed unanimously. A motion was made by Kerry Cramer to keep the current amendment for Section 1109. The motion was seconded by Michael Moss and passed unanimously. Kerry Cramer will have a proposal for Chapter 13 at the next meeting. A motion was made by Kerry Cramer to delete Chapter 14 and replace it with the current amendment for Section 1303 and reference it as Section 1401. The motion was seconded by Jody Hilton and passed unanimously. A motion was made by Michael Moss to change the current amendments to Chapter 14 to amendments to Chapter 15 and delete the current amendment for ASSE 1072. The motion was seconded by Kerry Cramer and passed unanimously. A motion was made by Ray Moore to make a new amendment to the IBC Section 2902, numbering it

as a new section, 2902.6, using wording from the IPC Section 311, and maintaining the current amendment for Section 311.1 but to also add the words, "See IBC". The motion was seconded Jeff Park and the motion passed with a vote of five to one.

The committee began their review of the 2015 IRC along with the current amendments and the following recommendations were made:

A motion was made by Michael Moss to keep the current amendment for Section P2602.3. The motion was seconded by Jody Hilton and passed unanimously.

A motion was made by Michael Moss to keep the current amendment for Section P2602.4. The motion was seconded by Jeff Park and passed unanimously.

A motion was made by Jody Hilton to modify the current amendment for Section P2801.7 by changing the section number to P2801.8. The motion was seconded by Michael Moss and passed unanimously.

A motion was made by Michael Moss to keep the current amendment for Section P2902.1.1. The motion was seconded by Jeff Park and passed unanimously.

Kerry Cramer will have changes to review at the next meeting for the current amendments to Section 3009.

A motion was made by Michael Moss to keep the current amendment for Section P3103.6. The motion was seconded by Jeff Park and passed unanimously.

A motion was made by Michael Moss to keep the current amendment for Section P3104.4. The motion was seconded by Kerry Cramer and passed unanimously.

A motion was made by Michael Moss to keep the

current amendment for Chapter 44. The motion was seconded by Jody Hilton and passed unanimously.

The meeting adjourned at 11:30.

Note: These minutes are not intended to be a verbatim transcript but are intended to record the significant features of the business conducted in this meeting. Discussed items are not necessarily shown in the chronological order they occurred.

UAC, Gray Water Systems. Gray water recycling systems utilized for subsurface irrigation for other occupancies shall comply with R317-3, UAC, Design Requirements for Wastewater Collection, Treatment and Disposal and R317-4, UAC, Onsite Wastewater System.

2015 IRC

Amendments to IRC, Sections P3009.1, P3009.1.1, P3009.2, P3009.6, P3009.7, P3009.13.3, P3009.14 are deleted.

IRC, **Section P2910.5 Potable water connections**, is amended to read: When a potable system is connected to a nonpotable water system, the potable water system shall be protected against backflow by a reduced pressure backflow prevention assembly or an air gap installed in accordance with Section 2901.

IRC, Section 2910.9.5, Makeup water, is amended to read: Where an uninterrupeted nonpotable water supply is required for the intended application, potable or reclaimed water shall be provided as a source of makeup water for the storage tank. The make-up water supply shall be protected against backflow by means of an air gap not less than 4 inches (102 mm) above the overflow or by a reduced pressure backflow prevention assembly installed ~~an approved backflow device installed~~ in accordance with Section 2902.

IRC, **Section P2911.12.4 Inspection and testing of backflow prevention assemblies**, is amended to read: The testing of backflow preventers ~~and backwater valves~~ shall be conducted in accordance with Section P2503.8 (Include similar language as in IPC 312.10.3?)

IRC, **Section P2912.15.6 Inspection and testing of backflow prevention assemblies,** is amended to read: The testing of backflow preventers ~~and backwater valves~~ shall be conducted in accordance with Section P2503.8 (Include similar language as in IPC 312.10.3?)

IRC, **Section P2913.4.2 Inspection and testing of backflow prevention assemblies**, is amended to read: The testing of backflow preventers ~~and backwater valves~~ shall be conducted in accordance with Section P2503.8 (Include similar language as in IPC 312.10.3?)

IRC, **Section P3009 Subsurface landscape irrigation systems** is deleted in its entirety and replaced with the following: connected to nonpotable water from on-site water reuse systems. Nonpotable systems utilized for subsurface irrigation for single family residences shall comply with the requirements of R317-401, UAC, Gray Water Systems.

2015 IPC
CHAPTER 13
NONPOTABLE WATER SYSTEMS

Amendment to IPC, Section 202, Gray water is deleted.

A new IPC, **Section 1301.4.1 Recording,** is added. The existence of a non-potable water system shall be recorded on the deed of ownership for the property. The certificate of occupancy shall not be issued until the documentation for the recording required under this section is completed by the property owner.

IPC **Section 1301.5 Potable water connections,** is amended to read**:** Where a potable system is connected to a non-potable water system, the potable water supply shall be protected against backflow by a reduced pressure backflow prevention assembly or an air gap installed in accordance with Section 608.

IPC **Section 1301.9.5 Makeup water,** is amended to read: Where an uninterrupted supply is required for the intended application, potable or reclaimed water shall be provided as a source of makeup water for the storage tank. The makeup water supply shall be protected against backflow backflow by a reduced pressure backflow prevention assembly or an air gap installed in in accordance with Section 608. A full-open valve located on the makeup water supply line to the storage tank shall be provided. Inlets to the storage tank shall be controlled by fill valves or other automatic supply valves installed to prevent the tank from overflowing and to prevent the water level from dropping below a predetermined point. Where makeup water is provided, the water level shall not be permitted to drop below the source water inlet or the intake of any attached pump

IPC **1302.12.4 Inspection and testing of backflow prevention assemblies,** is amended to read: The testing of backflow preventers ~~and backwater valves~~ shall be conducted in accordance with Section 312.10.1, 312.10.2 and 312.10.3.

IPC **Section 1303.15.6 Inspection and testing of backflow prevention assemblies.** is amended to read: The testing of backflow preventers ~~and backwater valves~~ shall be conducted in accordance with Section 312.10.1, 312.10.2 and 312.10.3.

IPC **Section 1304.4.2 Inspection and testing of backflow prevention assemblies**. is amended to read: The testing of backflow preventers and backwater valves shall be conducted in accordance with Section 312.10.1, 312.10.2 and 312.10.3.

CHAPTER 14
SUBSURFACE LANDSCAPE IRRIGATION SYSTEMS

Chapter 14 Subsurface landscape irrigation systems is deleted in its entirety and replaced with the following: Subsurface landscape irrigation systems connected to nonpotable water from on-site water reuse systems shall comply with the requirements of R317-401,

IPC AMENDMENT STATUS LOG
PENDING

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705.11.2	Kevin Bell	5-7-15 denied Stay with current wording					
802.1.1	Committee	4-2-15 approved					
608.16.7	Ron Lord	Denied 5-7-15					

(22) IPC, Section 608.16.7, is deleted and replaced with the following: "608.16.7 Chemical dispensers. Where chemical dispensers connect to the water distribution system, the water supply system shall be protected against backflow in accordance with Section 608.13.1, Section 608.13.2, Section 608.13.5, Section 608.13.6 or Section 608.13.8. Installation for equipment of Section 608.13.5 and Section 608.13.8 shall be installed two (2) feet below the ceiling and twelve (12) inches above the top of the chemical dispenser unit. Chemical dispensers shall connect to a separate dedicated water supply line, not a ~~separate from any~~ sink faucet."

(23) IPC, Section 608.16.8, is deleted and replaced with the following: "608.16.8 Portable cleaning equipment. Where the portable cleaning equipment connects to the water distribution system, the water supply system shall be protected against backflow in accordance with Section 608.13.1~~,~~ or Section 608.13.2 ~~or Section 608.13.8.~~"

ASSE 1055 Chemical Dispensers

Use, Installation, and Design

June 1, 2015

Executive Summary

ASSE 1055 devices are as effective as ASSE 1001 devices for protecting against high-hazard substances entering the potable water system. Most devices consist of an elastomeric gap (e.g. e-gap, flex gap, etc.) acting as a check valve that vents to atmosphere when the device is not under pressure. They protect against backsiphonage and low levels of backpressure up a head height equal to the length of hose supplied.

When attached to a faucet that contains an internal ASSE 1001 or ASSE 1011 device, they must have a pressure bleed device as a part of that connection, and the faucet be shut off when not in use. Otherwise the vacuum breaker would be under continuous pressure and that is not the intent of those device designs. It is critical that local jurisdictions mandate and enforce this as this is an installation requirement and not a performance requirement within ASSE 1055.

What is an ASSE 1055 device?

The goal is to dilute a concentrated solution inline such that the right amount of mixed solution can be dispensed with minimal waste and footprint. Chemical dispensers are comprised of (2) main components in order from the inlet: a backflow prevention device, and a mixing chamber. This basic design can manifest itself in a variety of products whether it be a bottle filling device in a janitorial closet for cleaning solutions, a soap mixer at a commercial car wash station, laundry systems, or dishwashers.

Note that the types of substances used in the applications are not desired in the potable water supply. ASSE International, as a leading voice of backflow protection, and its partners wrote the ASSE 1055 standard in order to address concerns about the backflow of high-hazard materials. Protection methods against high-hazard contaminants[1] and low-hazard pollutants[2] are well-known. Table 1 gives a list of the different variety of devices that can be used to protect against high-hazard substances under a backsiphonage condition, and which can be used within 1055 devices.

Standard	Description	Used within 1055?
ASSE 1001	Atmospheric type vacuum breakers	Yes
ASSE 1002	Anti-siphon fill valves for water closet tanks	
ASSE 1011	Hose connection vacuum breaker	
ASSE 1013	Reduced pressure principle backflow protector	Yes
ASSE 1019	Wall hydrant with backflow protection and freeze resistance	
ASSE 1020	Pressure vacuum breaker assembly	Yes
ASSE 1047	Reduced pressure detector assembly	
ASSE 1052	Hose connection backflow preventer	
ASSE 1053	Dual check backflow preventer wall hydrants – freeze resistant type	
ASSE 1056	Spill resistant vacuum breaker	Yes
ASME A112.1.2	Air gaps in plumbing systems (for plumbing fixtures and water-connected receptors)	Yes

Table 1 - A backflow protection device must comply with at least one of these standards in order to offer high-hazard protection.

[1] Contaminants cause harm to human health, per the ASSE Plumbing Dictionary, 6th Ed.

[2] Pollutants cause foul odor, taste, or change in visual appearance but are safe to ingest, per the ASSE Plumbing Dictionary, 6th Ed.

The particular substances that are considered high-hazard or low-hazard are left up to the local authorities having jurisdiction (AHJ). At the same time, a list of generally accepted facilities utilizing high-hazard solutions in their processes that could contaminate the water supply are given in Appendix A.

It is important to reinforce the fact that ASSE 1055 devices give high-hazard backflow protection. For example an RPZ installed upstream will give no significant additional backflow performance.

What is not an ASSE 1055 device?

There are (3) criteria to decide whether or not a 1055 should be used:

1. Backflow protection is located further upstream;
2. There is no mixing of water and chemical concentrate;
3. There are no means for a connection to potable water.

This means that faucet-mounted proportioning valves, drum-mounted proportioning valves & hand pumps, peristaltic pumps, bottle dispensers, and foamers are all examples of non-1055 system types. Example images of these can be found in Appendix B. As with any other fixture or fitting, ASSE 1055 devices must be installed as per the local AHJ.

Elastomeric Gaps

There is a class of devices known as elastomeric gaps (also known as e-gaps, and flex gaps) that comprise the majority of ASSE 1055 devices. Operation of these devices are similar to atmospheric vacuum breakers (ASSE 1001) applied downstream of flushometers, where water flows past a single check, and where its air vents are closed when under pressure, and open when not under pressure.

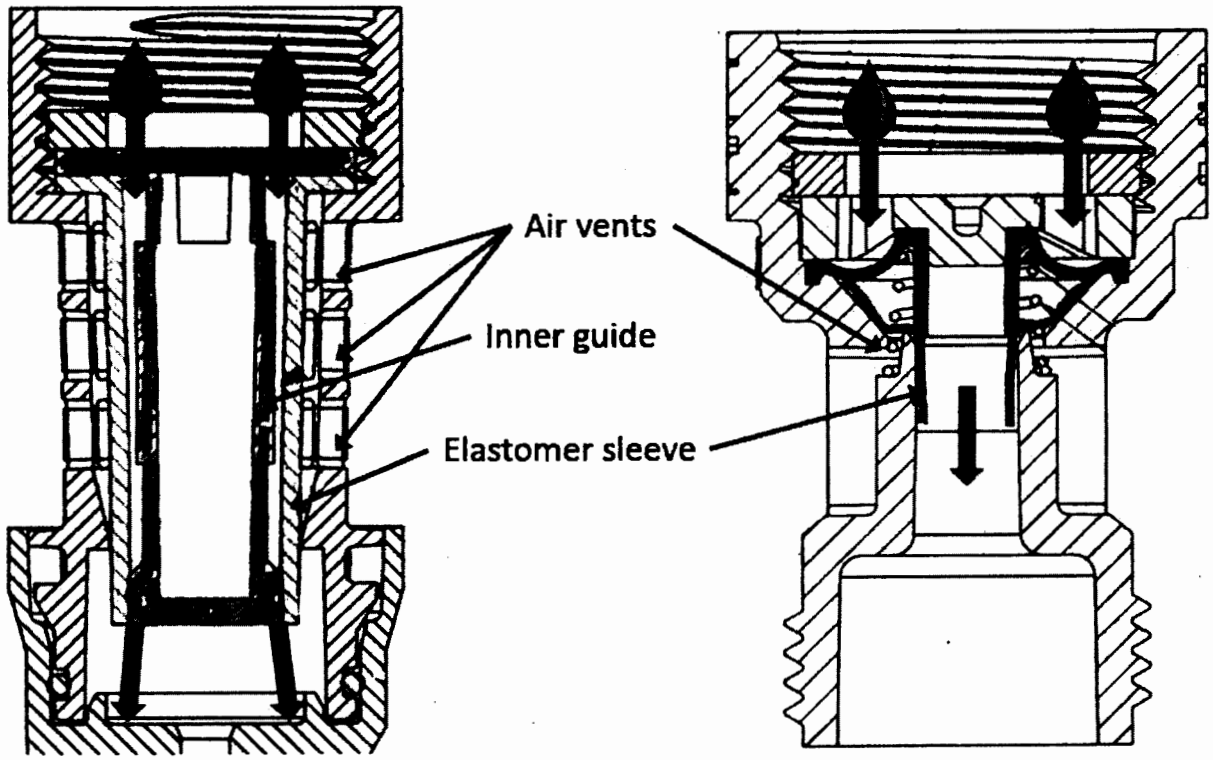

Figure 1 - Cross-sections of example elastomeric gap devices and their features.

	ASSE 1055	ASSE 1001
Hydrostatic test of assembly	188psi or 1.5x mfg rating	250psi or 2x mfg rating
Performance under manufacturer's temperature & pressure	Maximum, simultaneous temperature & pressure	110°F or 180°F, then 250psi or 2x mfg
Pressure loss / flow capacity		≤10psi at rated flow
Air inlet shield		Dimensional check
Air flow test		Yes
Backsiphonage test	Hold check open	Fouled check
Female connections		No interference
Tipping	10deg	
Backpressure	4.3psi	

Table 2 - Comparison of all performance requirements between the ASSE 1055 and ASSE 1001 standards.

Per Table 2, there are some differences between the two standards.

- The hydrostatic test is performed above the manufacturer's rating;
- Its performance is tested at the simultaneously-applied manufacturer's rated temperature and pressure;
- ASSE 1055 does test for flow performance;
- The backsiphonage test achieves the same goals;
- The requirement of female connections has to do with testing for reduced flow capacity;
- Tipping is not germane to the backflow discussion;
- ASSE 1055 requires a device to withstand 10ft of head pressure with a raised hose unlike ASSE 1001 which requires the device not be subjected to any backpressure.

With respect to the air inlet, elastomer gaps are normally within the main assembly of the 1055 device, which can include a shroud or outside cover. The goal of the air flow test in the ASSE 1001 standard is to verify that the air flow capacity past the check meets or exceeds the air flow capacity past the vents. The restriction in flow must be at the check, not the air vents, in case of backsiphonage.

However, because an ASSE 1055 device must be able to withstand a small amount of backpressure (0.22psi or 6in of water) for 5 minutes, this means that the check is normally closed and requires a cracking pressure >0psi. Any backsiphonage will act against that check and will not allow air to flow past. Therefore, an air inlet test is not appropriate for an ASSE 1055 device.

Elastomer Gaps are not Air Gaps

While an ASSE 1055 device may include an air gap, it needs to be stated that elastomer gaps themselves should not be regarded as air gaps as per ASME A112.1.2-2012. The reason is because a seal needs to be created by the elastomer when water is flowing to create the venturi effect in order to draw in the chemical concentrate. The venturi effect is caused by the flow past a bottleneck combined with an inlet port at the middle of the bottleneck. That flow cannot happen without the assistance of line pressure and the seal given the typical geometry of these devices.

Connections to Potable Water

Most 1055 devices are installed after the building and health inspections have been completed. The most common connection made is to a faucet with a hose connection, either on a service sink in a

janitorial room or on a 3-station sink in a commercial kitchen. Less common are the connections made to a dedicated water line.

Faucet Connections

Many newer faucets in the field have integrated ASSE 1001 or 1011 devices in their assemblies combined with a hose connection at the outlet. These devices are downstream of the hot and cold valves so that they are not under continuous pressure. This design is so temporary connections (less than 12 hours) can be made via hose to fill a bucket or to connect to a chemical dispenser. The problem is that temporary connections can become permanent.

When a hose connection is permanent and there is an ASSE 1001 or 1011 upstream of it, there must be a pressure bleed device (PBD) installed. Water will flow out of the PBD as long as the faucet is turned on. Having the water on for more than 12 hours is still considered a permanent connection, so when the device is not in use, the faucet needs to be turned off. A visual indicator of running water should be enough to prompt a user to turn it off.

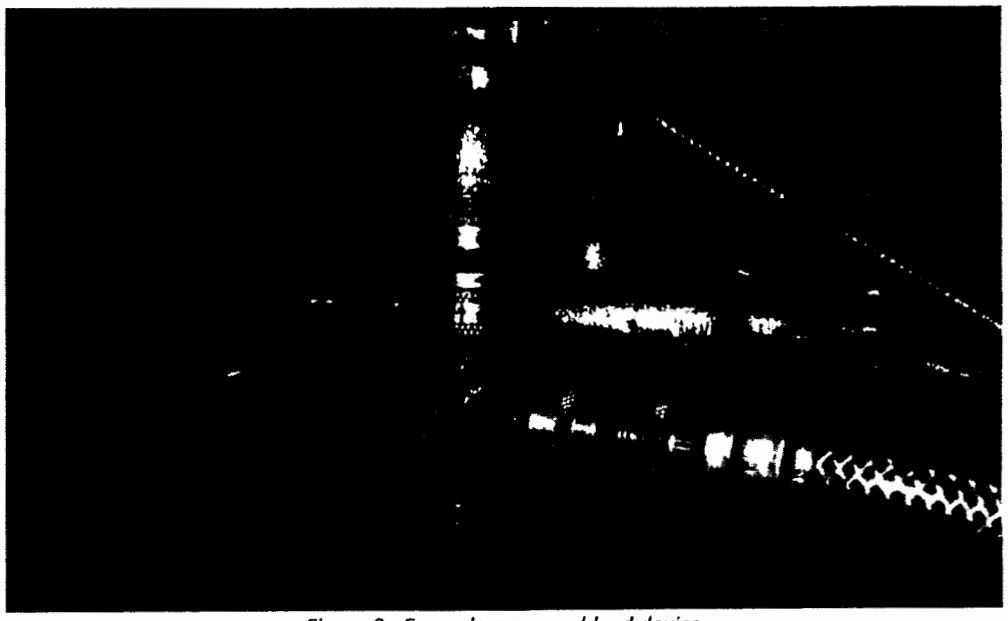

Figure 2 - Example pressure bleed device.

If a faucet does not contain an integrated ASSE 1001 or 1011 device, there is no issue as the 1055 device can have a shutoff upstream of the backflow device. If there is no shut off, there will be a flow from the outlet of the chemical dispenser. This is only permissible for over 12 hours if within the 1055 device is a 1013, 1020, or 1056 backflow preventer device.

Connections to a Dedicated Line

Where a separate, dedicated source of water has been installed for an ASSE 1055 device independent of a faucet, the device either needs to employ a shut-off at its inlet, or have a backflow prevention device that is capable of being under continuous pressure: an ASSE 1013, 1020, or 1056 device.

Conclusion

ASSE 1055 devices provide the desired high-hazard backflow protection when used correctly.

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Appendix A

From the ASSE Guide to Cross-Connection Protection Devices and Assemblies – Application & Selection, 2nd Ed.:

The following list includes, but is not limited to, typical examples of buildings considered to be a high hazard facility should a backflow condition occur:

- Animal care facility
- Beauty salon
- Car wash
- Chemical research plant
- Dental office
- Dry cleaning facility
- Fire station
- Funeral home
- Garden center / nursery
- Hospital
- Industrial building
- Manufacturing facility
- Marina, including docks & piers
- Medical facility
- Morgue
- High school & middle school
- Sewage treatment plant
- Sports complex
- Strip mall stores off of a single water meter

Also, when there is limited or restricted access to a building, it is necessary to classify the building itself as high hazard. The use of a containment method in order to protect the potable water supply is required. Other reasons for classifying a building as high hazard include, but is not limited to, frequent occupancy changes, multiple water supplies, and piping alterations.

High hazard buildings typically involve the use of both methods of backflow protection: containment and isolation. The containment method is used to protect the public water supply, whereas isolation refers to protecting the intra-building water distribution system.

Low hazard buildings typically only utilize the isolation method of protection.

Appendix B

There are chemical dispensers that do not fit in with the scope of ASSE 1055 because it is assumed in these cases that either:

1. The backflow protection is located further upstream;
2. There is no mixing;
3. There are no means for a connection to potable water.

Below are some examples of non-1055 systems:

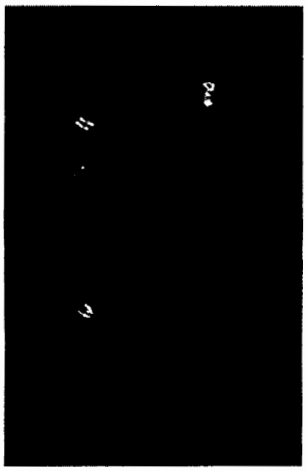

Figure 3 - Faucet mounted proportioners

Figure 4 - Bottle dispensers and foamers

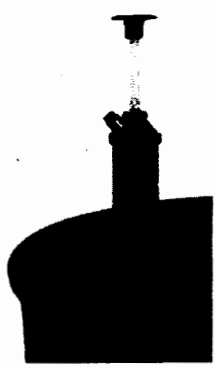

Figure 5 - Hand pumps

Figure 6 - Drum-mounted proportioners

Figure 7 - Peristaltic pumps

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18927 Hickory Creek Drive, Suite 220 • Mokena, Illinois 60448
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ENGINEERING COMMUNIQUÉ

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From: THE SMITH ENGINEERING GROUP

SUBJECT: 2015 EDITIONS of the IAPMO/UPC & ICC/IPC PLUMBING CODES

The 2015 editions of the IAPMO-UPC and ICC-IPC plumbing codes have been released. The UPC remains the same in the storm drainage section as the 2012 edition. The IPC has changed some of their sizing criteria and deleted the roof square footage sizing charts which may create confusion.

For those of you who fall under the UPC jurisdiction it is status quo for now. For those of you under the IPC jurisdiction, we will attempt to clarify some statements just in the event an engineer questions this revision.

Presently, the AMSE A112.6.4 Roof Drain Standard is being revised by the ASME roof drain committee. The requirement for gallons per minute (GPM) flow through the roof drain will be addressed and a requirement for minimum flows will most likely be inserted at the next release of the standard.

In the last three years much controversy has taken place regarding roof drain flow rates. This was all based on partial testing initiated by ASPE at a third party testing agency and later moved to another third party testing agency. This testing (Note 1) was totally inconclusive, not consistent and did not come close to representing real conditions as too many variables were left unanswered. To quote the old saying "it was not apples for apples". The stated flow rates in this testing are based on particular test piping configurations and dimensions.
Actual installed flow rates cannot be stated unless the piping configuration is known and the effects of the drainage piping calculated.

Both major codes (UPC & IPC) debated over proposals, verbiage and so forth in an effort to understand and clarify the confusion.

Some are of the opinion the flow rate through the roof drain dictates the flow for the entire interior storm water system. This is not accurate as the piping configuration is the major impact on flow. Fact: The storm piping system dictates the flow not the roof drain. The configuration of the storm piping system will alter the GPM flow.

For example per Table 1106.2 (Page 3): A 4" vertical drain will flow 180 GPM but when turned horizontally, it is reduced to 81 GPM @ 1/16" slope per foot and 115 GPM @ 1/8"slope per foot. The horizontal pipe size will have to be increased to 6" for both the 1/16" and 1/8" slopes to compensate for the flow.

Refer to page 3. Shown on this page are three paragraphs (1105.2, 1106.2 & 1106.3) and two tables (Table 1106.2 & Table 1106.3) taken directly from the 2015 IPC Storm Drainage Section - Chapter 11.

1105.2 states the published flow rate and head of water above the roof drain shall be used to size the storm drainage system in accordance with Section 1106. However, 1106.2 states the vertical and horizontal storm drain piping shall be sized based on the flow rate through the roof drain but then states the flow rate in the storm drain piping shall not exceed that specified in Table 1106.2. Confused, it is understandable! Therefore, 1106.2 lists maximum vertical and horizontal flow rates. The horizontal flow rates are based on the slope of the piping and overrides and limits the roof drain and vertical flow rates.

What does the engineer do since there are no published flow rates? He has two choices: use the square footage charts (Note 2) from the 2012 IPC or size his system based on the maximum flow rates shown in the Tables.

As an example of the Tables determining the maximum flow, refer to page 4. The GPM flow rates at different heads are shown for a 4 outlet/vertical. Only the 4" outlet / 4" head falls under the allowable GPM flow rates. The others exceed the maximum flow rate shown in the table.

FACT:

- ◇ There are no manufacturer's published flow rates.
- ◇ The maximum flow rates in Table 1106.2 overrides any future published roof drain flow rates.
- ◇ Horizontal flow rates overrides vertical flow rates.
- ◇ Using the traditional roof square footage charts, the designer knew how much roof area to discharge to one drain.

Note 1: The test data was based on flow through a roof drain with no piping connected and another test with a pipe connected and immediately turning 90° horizontally, running a short distance and turning 90° vertically. This test data does not establish precise/exact flows. This does not reflect real world conditions.

Note 2:
The square footage chart previously existing in both codes have proven to be adequate in sizing roof drains and interior storm water systems for over 70 years. These charts have safety factors built into them.

Statements were made indicating numerous roof failures have occurred because of the inadequacy of the roof drain to flow the proper GPM or the inability of the designer to correctly size the storm water system because of a lack of flow rates not shown in the manufacturer's catalog/web data. This is an alarmist statement with no basis of validation. There has never been a list released to the public unequivocally identifying the roof drain itself as the culprit in the so-called 'numerous roof failures'. The majority of failures were a result of inadequate roof structure (most prevalence), lack of maintenance in cleaning the debris around the domes, undetected stoppage in the rain leader, lack of sufficient roof drains, undersized roof drains and storm water piping, improperly installed roof drains (page 5), lack of sufficient secondary/emergency roof drains/systems and lack of scupper drains in the parapets.

The most common reason is an abnormal or catastrophic weather occurrence/phenomenon such as a hurricane, tornado, 500 year storm or micro burst.

FACT: STATED FLOW RATES FOR ROOF DRAINS ARE BASED ON PARTICULAR TEST PIPING CONFIGURATIONS AND DIMENSIONS. THE ROOF DRAIN DOES NOT DICTATE THE FLOW THROUGH THE SYSTEM. THE CONFIGURATION OF THE STORM PIPING WILL ALTER THE GPM FLOW.

2015 IPC CODE STATES:
SECTION 1105 ROOF DRAINS
1105.2 Roof Drain Flow Rate: The published roof drain flow rate, based on the head of water above the roof drain, shall be used to size the storm drain drainage system in accordance with Section 1106. The flow rate used for sizing the storm drainage piping shall be based on the maximum anticipated ponding on the roof. ❷

1106.2 Size of Storm Drain Piping: Vertical and horizontal storm drain piping shall be sized based on the flow rate through the roof drain. **The flow rate in storm drain piping shall not exceed that specified in Table 1106.2.**

1106.3 Vertical Leader Sizing: Vertical leaders shall be sized based on the flow rates from horizontal gutters or the maximum flow rate through the roof drains. **The flow rate through vertical leaders shall not exceed that specified in Table 1106.3.**

TABLE 1106.2					
STORM DRAIN PIPE SIZING					
		SLOPE OF HORIZONTAL DRAIN			
PIPE SIZE IN INCHES	VERTICAL DRAIN - GPM❶	1/16" PER FOOT GPM	1/8" PER FOOT GPM	¼" PER FOOT GPM	½" PER FOOT GPM
2	34	15	22	31	44
3	87	39	55	79	111
4	180	81	115	163	231
5	311	117	165	234	331
6	538	243	344	487	689
8	1,117	505	714	1,010	1,429
10	2,050	927	1,311	1,855	2,623
12	3,272	1,480	2,093	2,960	4,187
15	5,543	2,508	3,546	5,016	7,093

TABLE 1106.3	
SIZE OF LEADER IN INCHES	VERTICAL LEADER SIZING – CAPACITY IN GPM❶
2	30
3	92
4	192
5	360
6	563
8	1,208

NOTE ❶: The vertical flow rates shown in Tables 1106.2 & 1106.3 are full (bore) flow rates. To achieve full flow, a certain head of water must cover the roof drain. This head of water in relationship to the drain's ability to discharge a certain GPM is what creates the ponding. Depending on several variables, the head and resulting GPM will vary. Head and flow rates are affected by various factors including rainfall intensity, ambient temperature, wind, slope of the roof and more.

NOTE ❷: To determine the ponding depth, the designer must take into consideration the depth of water (head) when the full flow is achieved over the roof drain. By determining the cubic volume of water ponding over each drain, the designer can convert it into pounds and provide the potential load information to the structural engineer. 1105.2 mentions 'based on head (height) of water above the roof' and later states 'based on the maximum anticipated ponding on the roof'. Some will use the ponding depth to determine the volume of water to provide to the structural engineer. This should not be used. The head of water during a severe rain storm will vary. A more practical/safe method is to use the invert on the parapet scuppers to determine your possible head of water during a severe storm.

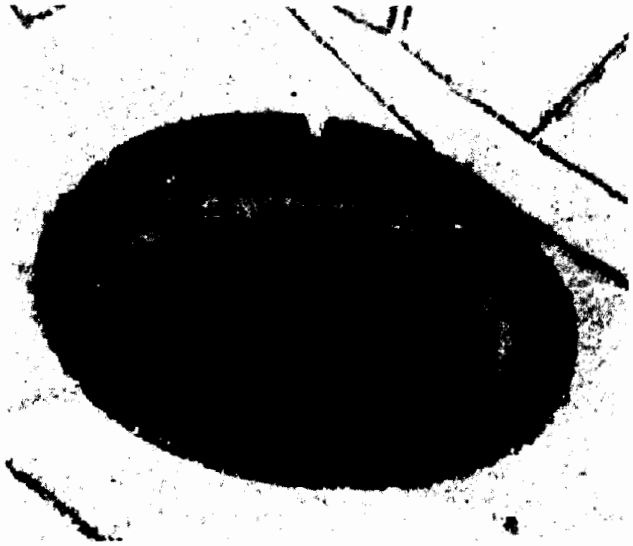
APPROXIMATE GALLONS PER MINUTE FLOWS THROUGH A 4" OUTLET ROOF DRAIN COMPARED TO MAXIMUM ALLOWED FLOWS PER TABLE 1106.3

OUTLET SIZE	HEAD OF WATER	L/S	GPM ❶	MAXIMUM VERTICAL ALLOWED PER TABLE 1106.3	MAXIMUM VERTICAL ALLOWED PER TABLE1106.2	COMMENT
4" (100 MM)	4" (100 MM)	08.5	135	192 GPM	180 GPM	ACCEPTABLE
4" (100 MM)	6" (152 MM)	13	201	192 GPM	180 GPM	EXCEEDS ❷
4" (100 MM)	8" (203 MM)	17	269	192 GPM	180 GPM	EXCEEDS ❷
4" (100 MM)	10" (254 MM)	18	288	192 GPM	180 GPM	EXCEEDS ❷
4" (100 MM)	12" (305 MM)	22	346	192 GPM	180 GPM	EXCEEDS ❷
4" (100 MM)	14" (357 MM)	26	405	192 GPM	180 GPM	EXCEEDS ❷

❶ Estimated vertical full flow rate at maximum head through the roof drain only. Once a horizontal turn is made, the flow is reduced. These are estimated flow rates only.

❷ The vertical flow rate through the roof drain exceeds the vertical flow rate in the Tables so the flow rate for the Tables must be used for sizing.

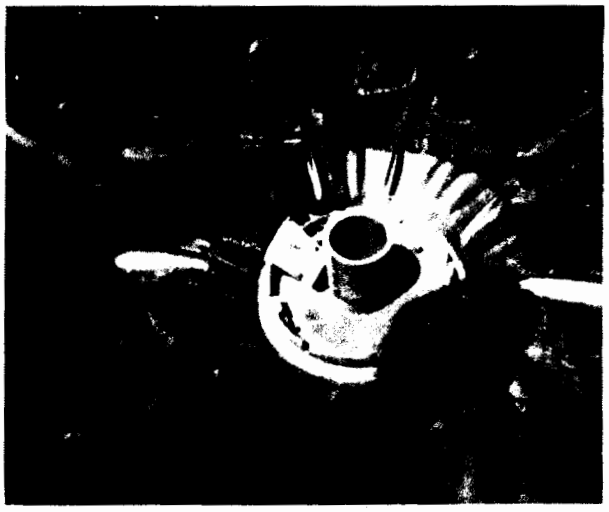
MEMBRANE CUT AT INSIDE DIAMETER OF THE SUMP CORRECTLY



CLAMPING COLLAR INSTALLED

A roof was investigated where excessive ponding had occurred. These were 10" outlet roof drains so the flow rate was of extremely high volume and the drain itself was responsible for draining a massive area of roof. The membrane covered almost the entire sump area with a circular cut hole in the center of the sump but it was only 4" in diameter. Since it was a 10" outlet, the installer created a reduction in the outlet size by reducing the open area diameter by 6 inches. The drain could not flow its anticipated and required GPM flow, therefore; created enormous ponding of water whose weight exceeded the maximum PSI rating for the roof structure and it collapsed. An installation error.

It is common practice for the membrane installer to cover the entire sump area and then cut it back to the inside diameter of the sump. In the case described above, all the installer did was cut a 4" diameter hole in the center of the sump. As noted, it reduced the flow capability by 6" diameter. There is not a photo of the actual installation but imagine in the left photo the membrane only having a 4" hole in the center. This description is typical of what was mentioned in Note 2 regarding improperly installed roof drains.



THE MEMBRANE APPEARS TO BE INSTALLED CORRECTLY WITH THE 1080 ROOF DRAIN UPON REMOVING THE COLLAR, IT WAS BUNCHED UP IN THE ROOF DRAIN SUMP

THE MEMBRANE IS NOT CUT BACK PROPERLY. IT NEEDS SOME ADDITIONAL TRIMMING BACK TO THE SUMP I.D.