IN THIS ISSUE

ASPE American Society of Plumbing Engineers™ BALTIMORE

MEETING FORMAT

4::00-5:00 PM Vendor Set Up
5:00-6:00 PM Panel Discussion
6:00-8:00 PM Hands on Demo
Rotations + Dinner

DATE: January 28, 2026
TIME: 5:00pm to 8:00pm
PLACE: UA486 Training School
TOPIC: Hands on Demo

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BALTIMORE CHAPTER ASPE

Newsletter questions? Please contact Nicole Murphy

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DATE: JAN 28
TIME: 6-8PM*
*Doors open 5PM

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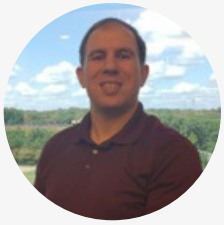

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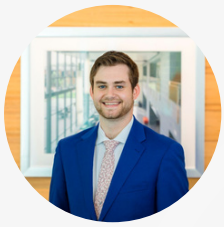

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Chuck Swope, PE, CPD, LEED AP BD+C
Chapter President

A I have started and stopped writing this message many times over the last few weeks, struggling to find the right words to describe the journey we've shared. As I announced during our last meeting and award ceremony, I will be stepping down as Chapter President at the end of this season. This is not a decision I reached lightly, nor is it one made in haste; rather, it is a choice made with a deep respect for the future of this organization.

While our chapter has achieved a great deal in recent years, I want to be very clear: the credit does not belong to me. It belongs to our dedicated board and the members who show up, engage, and push us forward. I am incredibly proud of the milestones we've reached together, from the synergy of our Industry Night with Local 486 and our annual commitment to DiscoverE during Engineer's Week, to the technical presentations I've had the honor of sharing from an engineer's perspective. These weren't just events; they were the building blocks of a stronger community. My goal has always been to lead by example. I will never ask anyone to do something that I am not willing to do myself.

My own path on the board began in 2017 when I joined as your VP Technical, eventually stepping into the role of President in 2022. Throughout these years, I have watched the natural ebb and flow of leadership. I've seen board members join and leave, but I've also noticed a recurring challenge: many leaders work tirelessly but seemed to be to leave the industry entirely. I also want to address a common fear: I think too many people view joining the board as a lifetime commitment or a heavy burden. In reality, we stay on this board because we truly love the company we keep, not out of a sense of grim obligation. I have been fortunate to serve alongside many who have been here much longer than I, and I have leaned heavily on their wisdom and counsel.

The experiences I've had during my tenure are directly responsible for the person I am today. Serving as a delegate at our national business meetings has taken me across the country, opening doors to factory tours, seminars, and a network of professionals who are as generous with their knowledge as they are with their time.

More importantly, I attribute a significant portion of my career growth to ASPE. This organization forced me out of my "comfort zone". I put that in quotes because, as those who know me can attest, I've never been one to get too comfortable. Comfort is the cousin of complacency; it leads to a "business as usual" mindset where we simply do the same things over and over because that's how they've always been done. I'd like to think that over the last decade, we've successfully shaken things up and breathed new life into the chapter.

Ultimately, the main reason I am stepping down is to create the space for others to step up. Growth requires change. There is a long-standing tradition in ASPE that the VPT serves as the natural successor to the President, yet that sequence has only recently been restored when I took over from my predecessor, Jeff Edwards. I will have to defer to our Historian, Jason Eagles, to recount the "before times" (the BJE era, if you will), but I am excited to see that succession plan back in motion.

Don't worry your little ASPE hearts, though—I'm not going anywhere. I remain deeply committed to this chapter and its mission. In fact, don't be surprised to see my name on the ballot during our May meetings. We are heading toward an honest-to-goodness election, and I look forward to continuing to serve this chapter in a new capacity.

As a final note, I must extend a deep (and perhaps long-overdue) apology to Nicole Murphy, our VP Membership and newsletter editor. Nicole, I have never turned in an article on time in all my years of service, and if I'm being honest, I have no real intentions of changing that now. I suppose you can just chalk it up as one of the final perks of being the HMFIC.

Thank you all for the opportunity to lead.

Your Chapter President,
Chuck Swope


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ASPE American Society of Plumbing Engineers™ BALTIMORE

Julian Chiveral, PE, CPD, LEED AP BD+C
Vice President- Technical & Education Chair

Technical Report

Happy new year, folks! I hope everyone enjoyed some much-needed time off and is feeling refreshed as we begin the new year. My new year's resolution is to submit everyone's CEU credits on time, which should last until about February just like everyone else's resolutions!

Before I jump into what we've got planned for 2026, I need to give a huge shoutout to our panelists last month who led an informative discussion at one of our best attended meetings so far this year. Thank you, Chris Imhof, Nick Bowley, Joe Bowman, and Mike Golabieski. And of course, many thanks to everyone who came out to listen, learn and socialize.

For January, we are swapping out our traditional dinner meeting style for Industry Night, hosted in partnership with the UA Local 486 Plumbers and Steamfitters Union. Industry Night is one of our annual events that isn't the VP-T's responsibility, so check out the flyer and our Education Chair's article for all the important details.

I hope to see you at the Local 486 Apprenticeship Training School on January 28th!

Education Report

Industry Night

When: January 28th at 6PM (Doors open at 5PM)
Where: UA486 Apprentice Training School in Rosedale
What: New offerings as well as fan favorite events from previous years: hands-on demonstrations, an expert-led seminar on backflow preventers, and a mini product show featuring our local reps. Industry night is always a fun one to attend – and it's an especially good opportunity to get some of the younger engineers you work with acquainted with ASPE.

This year, we will be joined again by McWane Plumbing Group and the Copper Alliance for our regular demonstrations in cast iron and copper pipe. We'll see the return of our mini product show from last year, and we are adding a new segment: a seminar on backflow preventor inspection! With the knowledge of one of UA486's backflow inspectors and access to their state-of-the-art backflow prevention room, this seminar on inspection protocols will surely impress.

Engineers' Week – volunteer opportunity!

When: February 23rd at 10AM – 2PM
Where: Engineer's Club in Mount Vernon, Baltimore
What: We are hosting about 100 local high school students at the Engineer's Club for a day full of plumbing engineering outreach and education. On the docket: a short presentation on plumbing engineering, a hands-on plumbing design activity, and a mini trade show to introduce students to the different facets of plumbing engineering. This is a fun and super rewarding event that we put on each year and would love for you to be involved!

We are seeking plumbing designers and engineers who are brave enough to lead a small group of students through how to size and layout domestic water and sanitary piping! Additionally, we are looking for plumbing engineering professionals to host tabletop presentations to introduce students to the many facets of plumbing engineering. Please reach out to learn more about it!

Modern Fixtures, Antiquated Drains and Water Efficiency

Technical Article (from Plumbing Engineer, a PHCP Publication)
June 2, 2025
By John Lansing, CPD, LEED Green Associate

How oversized are sanitary drains in buildings? When the drainage fixture unit was introduced in 1928 for a methodological solution to convert plumbing fixture quantities to minimum required drain diameters, 5 gallons/flush (gpf) water closets were the norm.

Should something about the way drainage and vent piping is designed have fundamentally changed now that much of the world is using 1.28 gpf (4.8 liter) water closets? Should there be concerns about not having enough drainage flow to move solids? These are questions the plumbing engineering and code development community have been asking for decades.

To start answering these questions, it's important to revisit the fundamentals of sanitary drainage theory: transporting water and solids to a point of discharge without creating pressure conditions within the drain that allow sewer gas to breach water seal barriers at fixture traps. In most of the world, a minimum of 2 inches (50 mm) of water is contained within a trap — a barrier so easily broken that it can be done with the human breath (2 inches is about a quarter the length of a typical drinking straw).

To avoid subjecting the drainage system to these pressures, it's critical to ensure that drains do not flow too close to full, which will restrict airflow and create pneumatic conditions within the piping.

Filling heights in various standards

Concerns about solid deposition date back to the Victorian era. Edwin Chadwick's "Report on the Sanitary Condition of the Labouring Population of Great Britain" from 1843 included some discussion from a London district surgeon who fixed a broom to the water closet (WC) lever to ensure continuous flow in the building drain and sewer. Inline flushing siphon tanks were suggested in the mid-19th century, and concepts of these devices continued to develop well into the later 20th century.

An example of a product developed in Scandinavia in the 1970s is the Gustavsberg siphon tank (later known as the WISA booster), which accumulates 4.75 gallons (18 liter) of drainage from fixtures before filling to a level that activates a siphon and provides a burst of flow. This was part of a strategy to overcome the comparatively lower drainage flow characteristics of the newly developed 0.8 gpf (3 liter) WCs.[1]

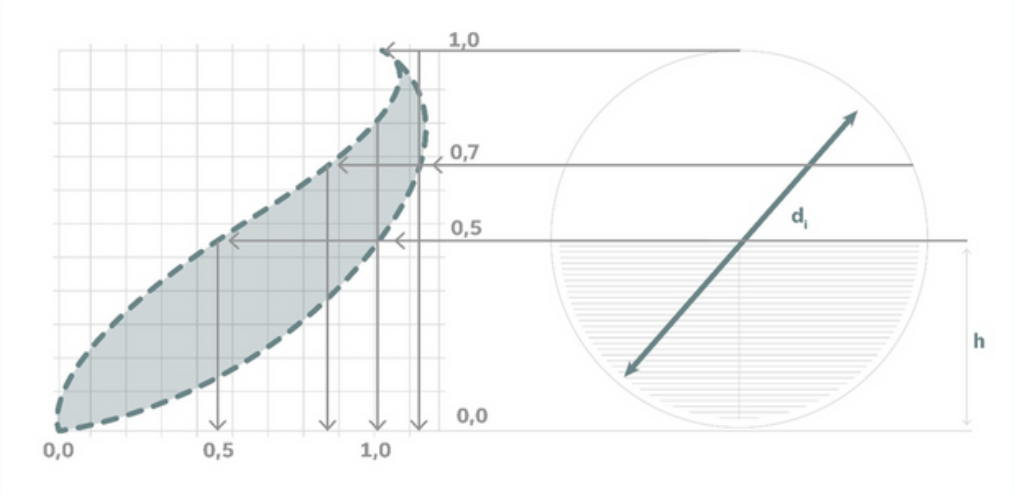
When compared with standards used outside of the United States and Canada, both the International Plumbing Code (IPC) and the Uniform Plumbing Code (UPC), which share sanitary drainage theory from the National Institute of Standards and Technology's work in the first half of the 20th century, require larger drain diameters, more vent piping and lower filling heights, despite the U.S. having very water-efficient fixtures.

The United States and many European standards were developed around the theory of maintaining no more than 50% of the filling height. In China (GB 50015, Standard for design of building water supply and drainage) and the Netherlands (NEN 3215, Drainage system inside buildings - Requirements and determination methods), national standards assume no more than 60% and 70%, respectively, and the UK approved Document H from the 2010 Building Regulations allows even more.

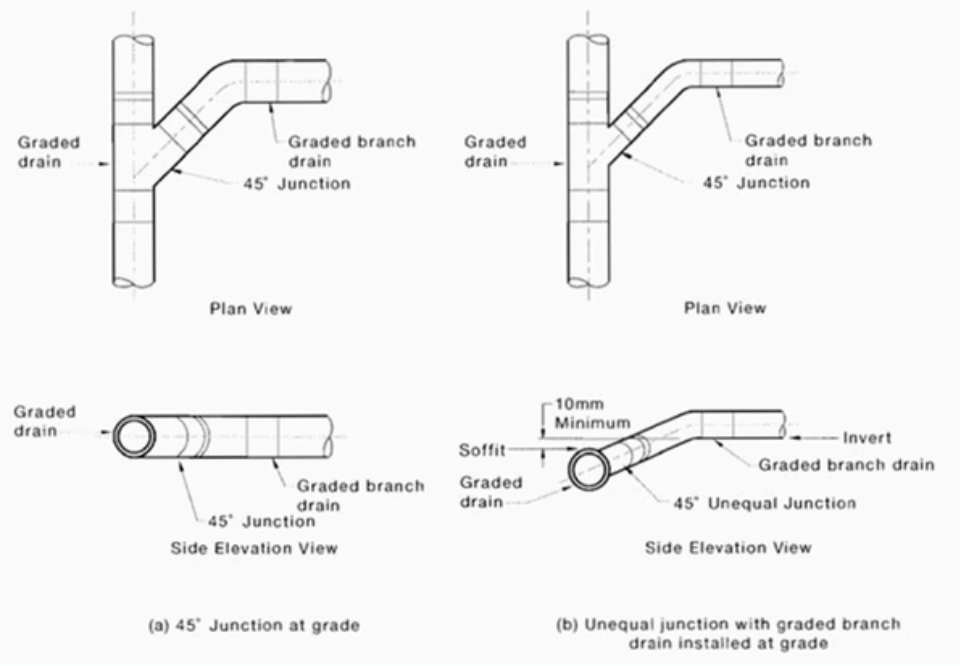
Higher cross-sectional filling heights have the advantage of better carriage of solids, which is the other critical design element.

Modern Fixtures, Antiquated Drains and Water Efficiency

IWhen applying the Colebrook White formula to horizontal drains, it is easy to see that the maximum velocity occurs near 80% (Figure 1). Higher-filling heights also help counteract the fact that the methods used for estimating flow in drainage design standards are very dated and don't reflect realistic flow rates.



Level invert junctions, which are prohibited in standard AS/NZS 3500, Plumbing and drainage, used in Australia and New Zealand, reduce the filling height in horizontal drains as the water "spills" into branches as it moves down the drain (Figure 2), creating conditions for blockages to form. This style junction is currently allowed in the IPC and UPC, including in buildings with greywater diversion, where the WC drainage is particularly at risk for solid deposition.

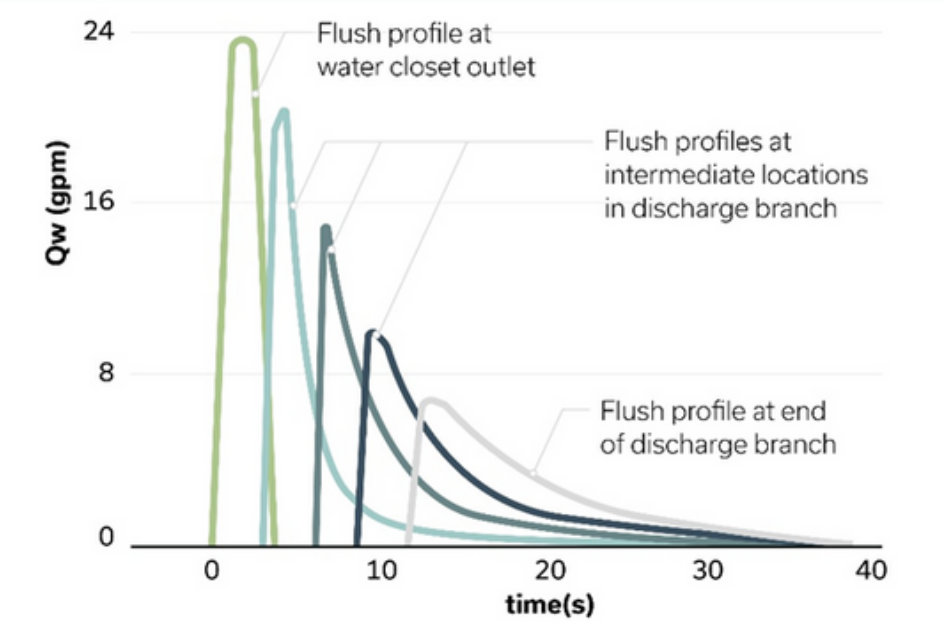


A growing number of U.S. localities are also requiring water recycling, which is typically accomplished with a separate network for water closets from other fixtures, further deviating from the original considerations of NIST's foundational work. This all points to the significant overdesign of U.S. drainage and vent systems, leading to expensive systems that, in many cases, perform worse.

Modern Fixtures, Antiquated Drains and Water Efficiency

Shallow flow and drainage performance

The height and velocity of unsteady flows, which describe the flow characteristics of the water closet, dissipate as the flow travels away from where the volume of water was released. Steady flows, such as those from a shower or a running faucet, will maintain a more predictable filling height along a long, horizontal drain. When a water closet is flushed, the drainage flow levels out; the burst of flow begins to transition to a shallow flow as the flush moves along the length of a horizontal drain (Figure 3).



As the flow becomes shallow, solids such as toilet paper are more likely to come to a stop as the water passes around. This highlights the concept of terminal drainage length, which is the point measured downstream of the fixture that additional flushing cannot continue to move a solid deposition unless multiple fixtures drain at once. Terminal length can be increased by avoiding oversized diameters and, even more so, by increasing the gradient.

Most importantly, the tensile strength and quantity of toilet paper are the driving factors. While it's difficult to control what people flush down the water closet, encouraging users to flush less toilet paper and other sanitary products can increase the performance of the drainage system. Water closets with bidet seats, for example, are not currently incentivized in codes from a performance standpoint but could be influential in reducing the amount of toilet paper entering the drainage system.

The same goes for sanitary product receptacles, which tend to be very small, simple containers that do not offer touch-free operation. The Plumbing Efficiency Research Coalition (PERC) investigations found that gradient was also a significant factor in the terminal drainage length for a water closet drain and, to a lesser extent, the diameter. Gradients of 2.5% and 1.6% are much more common abroad, whereas 1% gradients are common in the United States.

The Danish DS 432, Code of Practice for Sanitary Drainage - Wastewater Installations, suggests that drains should receive a minimum of 2.5 N/m2 of scouring force at least once daily to ensure there is enough flow to push solid depositions through. This establishes a design methodology that accommodates a "frequent peak flow" and an "infrequent peak flow," incorporating two fundamentals of sanitary drainage theory.

Modern Fixtures, Antiquated Drains and Water Efficiency

The Dutch NTR 3216, Sewerage inside dwellings - Guide for design and construction drainage standard, which assumes a 70% filling height, limits the horizontal changes of direction to ensure there is enough airflow to avoid trap siphonage. If the piping arrangement exceeds the limits, additional vent piping is required or the number of fixtures connected to the drain must be reduced to limit the maximum filling height.

Other factors such as the length and diameter of the drainage and vent piping, municipal sewer drainage flow and airflow characteristics, the presence of a building trap, wind characteristics and the location of the vent termination all contribute to the pressure conditions within the system.

Sanitary drainage design

An ideal sanitary drainage design methodology would account for all these factors mentioned here, and more, while also providing flexibility for designers to account for unanticipated installation challenges. This may come in the form of a rating system, which can be specified within the construction documents to ensure an appropriate minimum level of performance.

Airflow and drainage simulation modeling can be used to develop generalized methods to limit the need for expensive physical test rigs. Probabilistic methods accounting for measured usage patterns within different building types and for different fixtures should be used to accurately represent the true limitations of systems, to avoid both undersizing and oversizing of the peak frequent flow and the peak infrequent flow.

The ongoing International Code Council 815 Technical Committee seeks to make progress in this area, just as past efforts have with the PERC “Drainline Transport of Solid Waste in Buildings” and the International Association of Plumbing and Mechanical Officials’ WE*Stand have — building on the existing international drainage standards/codes and research.

Modern buildings need to be supported with a codified engineering methodology for sanitary drainage design. Some of the solutions to these challenges can be found by examining pathways taken from international standards, while others need to be formulated from newer research and investigations. These are the solutions that will help increase performance while achieving water-use reduction targets with less materials.

References:

[1] Inge Faldager, “Effects of low flush water closets on transportation in the drainage system.”

[2] J. Lansing, “An international review of design requirements for the single stack drainage configuration,” CIB W062 International Symposium for Water Supply and Drainage for Buildings, Leuven, 2023.

With 13 years of experience in consulting engineering, John Lansing, CPD, LEED Green Associate, specializes in applying sustainable solutions to plumbing systems as well as research on international engineering design guidance. He currently serves on technical committees for IAPMO Water Efficiency and Sanitation Standard (WE*Stand), the ICC 815 Standard for Sizing Water Distribution Sanitary Drainage and Vent Piping Systems, and the Australian Building Codes Board (ABCB). John has authored numerous publications through the American Society of Plumbing Engineers, the World Plumbing Council, and ASHRAE, as well as a proceedings presented in Leuven and Northampton at the CIB W062 International Symposium for Water Supply and Drainage in Buildings.

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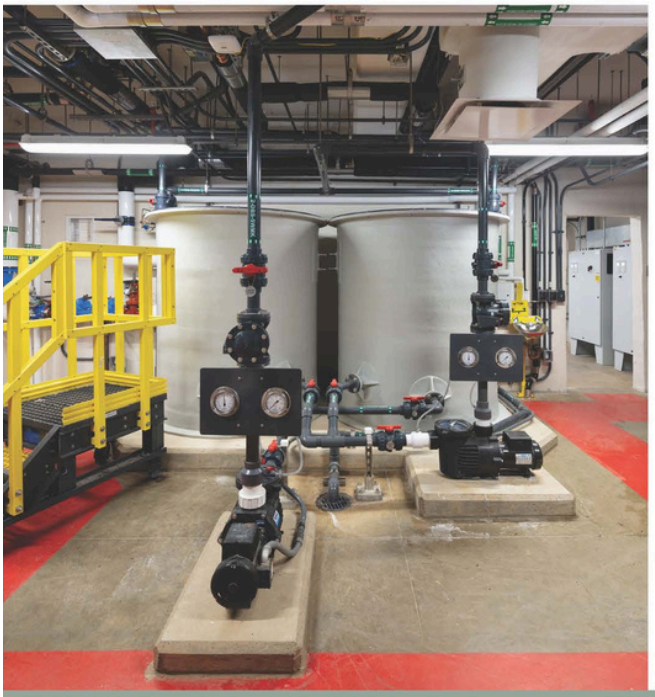

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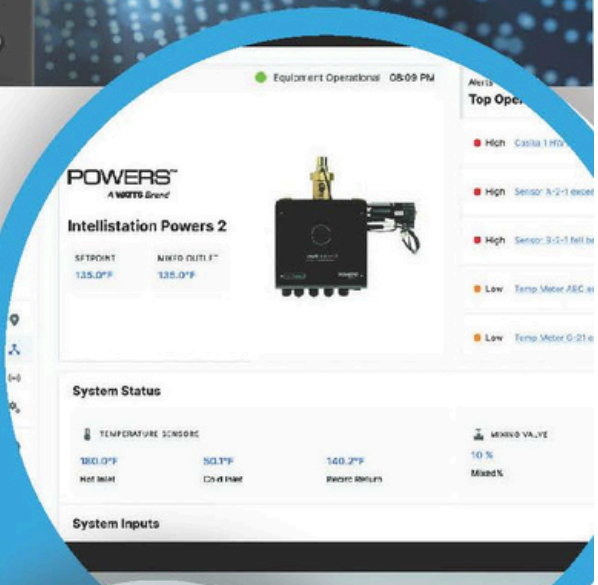

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Nicole Murphy
Vice President- Membership

Membership Report

New Members

Please join us in welcoming our newest members to the Baltimore Chapter!

Nicholas Marrow
Brieann McCormick
Lisa Reiheld

Happy New Year

As we reflect on the past year and look ahead to the future, we are proud to announce that our Chapter begins 2026 with 138 members. With your support, we anticipate continued growth and collaboration in the year ahead. Not that you need a reason to convince anyone, but I am going to give you just a few :)

- **Join a community that supports professional learning and real-world problem-solving.**
- **Attend events that offer insight into new technologies and best practices.**
- **Expand your network with peers, mentors, and industry partners.**
- **Take part in programs that encourage both personal and career growth.**
- **Help shape the future of plumbing engineering through active involvement.**

A special note of appreciation to Chuck, BTW no apologies necessary. It has truly been an honor to watch you lead and serve our Chapter with dedication and professionalism.

Looking forward to seeing everyone on January 28th!

Nicole Murphy

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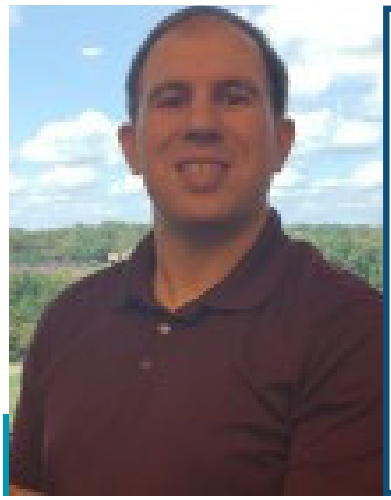

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14501 Sweitzer Lane
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Chris Imhof, PE, CPD
Vice President- Legislative

Legislative Report

Updates to Maryland State Plumbing Code

The Maryland State Plumbing Board appears to be in the final stages of adopting the 2021 IPC and IFGC. Check next month's newsletter for updates of effective date of Code and when jurisdictions are required to adopt latest versions of State Plumbing Code.

2030 UPC, UMC Development Timeline Now Available

IAPMO, developer of the Uniform Plumbing Code (UPC) and Uniform Mechanical Code (UMC), has posted online the timeline for the development of the 2030 editions of these prospective American National Standards.

See here for more information: https://www.phcppros.com/articles/22643-2030-upc-umc-development-timeline-now-available

Staying Current with the Latest NFPA 99 and NFPA 101 Requirements for Health Care Facilities

Health care facilities face significant fire and life safety challenges. NFPA data shows that between 2019 and 2023, an annual average of nearly 3,200 fires occurred in hospitals and medical clinics or doctor's offices in the United States alone. That is just under nine fires per day across these facilities.

Staying informed about the latest developments in these codes is crucial, as advancements over the past decade have necessitated updates for enhanced safety and optimal operation of facilities.

Both NFPA 101 and NFPA 99 are updated every three years as part of the NFPA standards development process. Some key highlights of the 2024 editions of NFPA 101 and NFPA 99 include:

For NFPA 101

- Provisions for horizontal exits and non-patient care suites that offer greater design flexibility.
- Increased size limits for patient care sleeping suites provide more design options and potentially reduce costly renovations.
- Carbon monoxide detection is now required in new health care occupancies.
- Expanded scope of the reference to NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*. The 2024 edition of NFPA 101 now requires all construction, repair, and improvement operations to comply with NFPA 241.
- New requirements for sterile cores clarify when they should be considered hazardous areas in both new and existing health care facilities. If sterile cores have appropriate walls and self-closing mechanisms on their doors, then they do not have to be considered hazardous areas.
- New language to address modular rooms and sleep pods. These prefabricated rooms need to be listed, meet certain size restrictions, and meet requirements related to interior finish. The location of modular

rooms or sleep pods must also be evaluated, and they must not obstruct the required means of egress for other areas in the building.

For NFPA 99

- New provisions for surgical smoke (medical plume) evacuation, addressing health risks from surgical smoke. It provides guidelines for the limited use of medical-surgical vacuum systems for surgical smoke evacuation, aligning with efforts by other organizations to promote clinical staff safety. This facilitates the adoption of technologies that improve air quality in operating rooms, protecting health care workers from harmful effects.
- A new section requiring all medical gas and vacuum systems to be provided with an auxiliary connection on the patient side of the source valve for connection to a temporary or supplemental source of supply.
- An updated section on medical gas and vacuum pipe sizing and design, requiring a calculation to be performed to ensure that the pressure loss across the system doesn't exceed 10 percent and that these calculations are retained as part of the facility's permanent record.
- A new section on cryogenic liquid withdrawal as well as cryogenic liquid piping, covering topics such as cryogenic liquid containers, the ventilation of spaces housing these containers, the materials used in these systems, pressure relief valves, and manifold arrangements.
- Added references to the ASSE International/International Association of Plumbing & Mechanical Officials/American National Standards Institute 6060, *Professional Qualifications Standard for Medical Gas Systems Designers*. The ASSE 6060 certification is for individuals who design new or existing medical gas systems. The certification covers the layout, sizing, and selection of equipment and piping, and the location of medical gas outlet/vacuum inlets.
- Added requirements for primary and secondary fire suppression systems for hyperbaric chambers. Previously, there were only prescriptive requirements stating that a deluge-type water spray system and a handline needed to be installed in all Class A chambers. This language has been changed to include options for alternatives to both the deluge and handline systems.
- New language to help consolidate electrical system performance, testing, and maintenance requirements into NFPA 99, as well as a restructured ground-fault protection section.

For more info visit: https://www.nfpa.org/news-blogs-and-articles/blogs/2025/12/10/key-health-care-changes-2024-editions-nfpa-99-and-nfpa-101

Reminder, NFPA codes are free for viewing at: https://www.nfpa.org/for-professionals/codes-and-standards/list-of-codes-and-standards/free-access

Chris Imhof, PE, CPD
Vice President – Legislative

ASPE American Society of Plumbing Engineers™ BALTIMORE

David Bailey
PLUMBING PLANS REVIEWER'S CORNER

Happy New Year everyone. Last month's review is the result of a project that I had undertaken.The floor plan below drew my attention immediately but not necessarily Code item. If you'll remember, there was a waste line design in the ceiling space with a Plumbing Note designation of 17. Unfortunately, the listed number of Drawing Notes on the sheet stopped at 14, oops.

This month's review involves adding a breakroom sink to an existing warehouse space. The faucet specified has a 1.75 GPM flow rate per drawing note, or 1.80 GPM per on-line manufacturer's spec sheet. The drawing under review has the following Schedule. What is the issue that was identified contributing to the disapproval of the drawing set submission?

WATER HEATER SCHEDULE

DESIGNATION	AREA SERVED	TEMP. RISE @ GPM FLOW	ELECTRICAL	APPROX. OPERATING WEIGHT	CAPACITY	MANUFACTURER	MODEL
IWH.1	BREAK ROOM 270	90°F+ TEMP. RISE @ 0.65 GPM 76°F TEMP. RISE @ 1.0 GPM 50°F TEMP. RISE @ 1.5 GPM	8,310 WATTS 277 VOLTS 1 Ph	5 LBS.	0	CHRONOMITE	M-30L/277-ADJ

NOTES:

1. WATER HEATER TO BE PROVIDED WITH FIELD ADJUSTABLE THERMOSTAT WITH AN OUTLET TEMPERATURE SET AT 120°F.
2. HEATING ELEMENT ACTIVATION AT 0.35 GPM FLOW.
3. PROVIDE WITH APPROPRIATE CHRONOMITE 2095-1 DISCONNECT SWITCH.

On another important subject, WSSC Water adopted the 2024 IPC, the 2024 IFGC, and the WSSC Water P&FGC effective December 1, 2025. All permit applications received by the Commission last month and linked plan cases are affected. Please make sure that applicable drawing submissions are designed to meet or exceed these recent 2024 Code adoptions.

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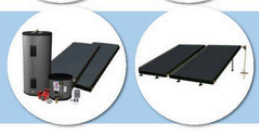

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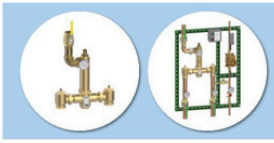

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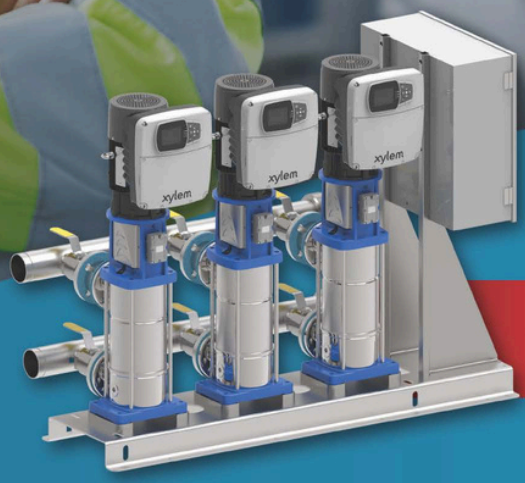

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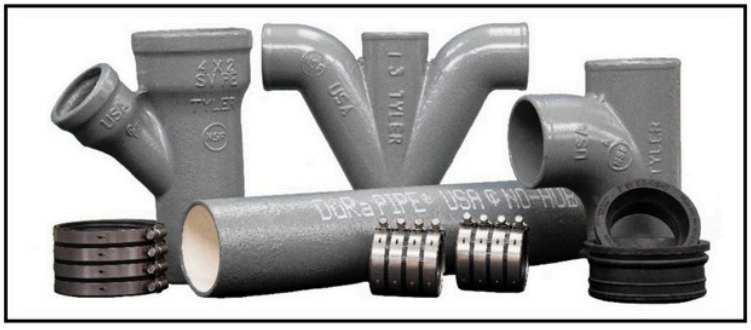

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Schedule of Meetings

DATE	Topic	Speaker
SEPT 17	Engineering Ethics And Dispute Resolution	Rebecca Bowman
OCT 15	Medical Gas	Niki Patel
NOV 19	Hot Water Recirculation Systems	Engineer Presentation - Chuck Swope (Mueller)
DEC 17	Everything We Do Wrong	Panel – moderator, code reviewer, Contractor, Sr. Engineer
JAN 28	Industry Night	Local UA5
FEB 18	Topic TBD	Engineer Presentation - Michael Do (Setty)
MAR 11	Communication Skills and Bridging Generational Gaps	Niki Patel and BJ Allen
APR 22	Fire Protection	Ken Isman
MAY 20	Topic TBD	Engineer Presentation - Joe Niedzielski (2RW)

If you have a specific topic, speaker, or case study you would like to see included in our program, please let us know. Likewise, if you or your firm would be interested in presenting at one of our sessions, we encourage you to share your availability.