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MEETING FORMAT

6:00 – 6:30	Social
6:30 – 6:45	Announcements & Table Tops
6:45	Dinner Served
7:00 – 8:00	Presentation

DATE:	October 25, 2023
TIME:	6:00pm to 8:00pm
PLACE:	Olive Grove Restaurant
TOPIC	Vacuum System Design
SPEAKER:	Nikita Patel Sherman Eng.

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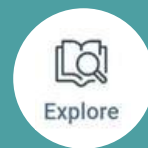
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Chuck Swope, PE, CPD, LEED AP BD+C
Chapter President

What an incredible beginning to the season! I am often accused of being relentlessly cheerful, but it's hard not to be when surrounded by dedicated chapter members. It sounds corny, but it's the truth. We are constantly trying to think of new things to bring to our members and future members, so please let us know if there's something on your mind. We've received some excellent feedback about topics for next season, but hopefully we can fit them in this one!

As you heard, I recently had the opportunity to attend this year's Technical Symposium, in Bellevue, WA. It was my first time on the West Coast and it was an amazing experience. First and foremost, ASPE puts on an excellent program every year, full of learning and networking opportunities. The technical symposium is dedicated to education sessions that benefit the industry as a whole, not just plumbing. One session that stood out to me was "Harnessing the Power of Waste Water". We're all familiar with the conventional conservation methods, like low flow fixtures, and hot water recirculation, even ASHRAE 90.1 and the IECC have guidance for insulation standards. However, we still heat water, use it once, and dump that heat down the drain! But wastewater is gross, right? It's like a tornado; it's not that the air is blowing, it's what the air is blowing that is the problem. Wastewater is very much the same. We can handle the water itself without much trouble, it's dealing with what the water is conveying that we don't want to obstruct. There are solutions out there, and it's better to be at the forefront of the technologies and learn all that you can before it becomes the norm. No one wants to tell a client "We don't do that, because we don't even know where to start". If you are interested in attending a future symposium or convention, please reach out! We'd love to put you in touch with companies that can facilitate.

Of course, there is a side benefit to attending: Awards! For the sixth season in a row, our chapter has earned the Award of Merit. I've brought it up many times before, but it is one of the best ways of indicating how well our chapter has adhered to the tenets set forth by the national society. It quantifies this by earning points for our schedule, meetings outside of the regular schedule like AYP and WOA events, outreach events like Engineer's week and all of the wonderful things that we offer throughout the season. And of course, we try to top ourselves each year. The required point total is based on chapter membership and because we have so many members, we are in the largest category. We needed 96 points to qualify, and I am proud to announce that we earned 155 points. Oh, and the society also awarded me and several others in our region with a special Coin of Appreciation. I am honored to be included with my esteemed colleagues that push our society forward. I use their inspiration to help me make a difference.

A special shout out to Aaron Mullenax and James Yang for attending as well. Both fine gentlemen were sponsored to attend, as their companies see the benefit in these learning opportunities. It's not just the topics, but the networking with fellow engineers. They traveled 2700 miles because there is no better place (outside of a Baltimore Chapter meeting) that you can have it all in one place.

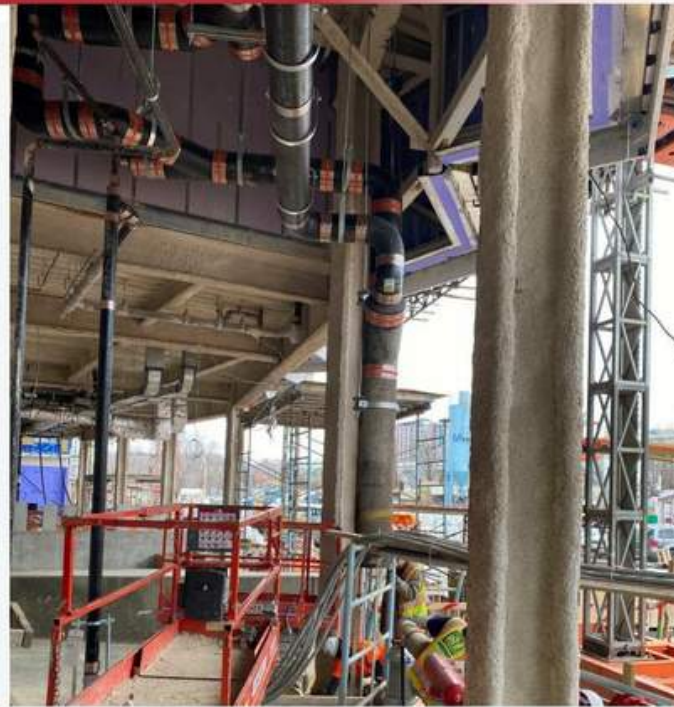
Chuck Swope, PE, CPD, LEED AP BD+C
Chapter President

In other news, Jason Eagles and I will be reaching out to the students at the Community College of Baltimore County next week. We're putting the finishing touches on a short intro to ASPE. Professor Kidd and Professor Cain have graciously allowed us to take a little time at the beginning of the class to tell the students that there is life after college and that could mean a career in the plumbing industry. We'll take about 5 minutes to tell them the benefits and career paths that are available and that there is more than just sitting in an office and cranking out drawings.

I don't want to take away from the interesting events happening this year, but we're planning big things for our 50th anniversary next season. I'm looking forward to this season, our anniversary, and beyond.



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Julian Chiveral, LEED AP BD+C
Vice President- Technical

Technical Report

Hello ASPE Enthusiasts!

October brings with it cooler weather, pumpkin spice, and everyone's favorite: another ASPE meeting! Before I get into our October technical session, I want to extend my sincerest thanks to everyone in attendance at our September meeting, especially our esteemed presenter BJ Allen, who brought his decades of experience in plumbing engineering to an enlightening presentation about communication skills in the AEC industry. It was a pleasure hearing from BJ and everyone else who pitched in to share their own effective communication strategies and their approaches when a communication breakdown has occurred. Remember: be the bison.

Our upcoming October meeting will feature yet another exciting topic from a great presenter. This month we'll be discussing the design and selection principles of vacuum systems. We'll explore some of the many applications in which vacuum systems are used, and how to size and select equipment to meet a variety of requirements, including the NIH DRM considerations for lab vacuum systems. Facilitating all this learning will be the one and only Nikita Patel, PE, a sales engineer at Sherman Engineering and longtime ASPE leader.

I can't wait to see Niki and the rest of the ASPE family at the meeting – it's gonna be a good one!

Lastly, in case you haven't heard, applications for the 2024 Alfred Steele Scholarship are now being accepted! The Alfred Steele Scholarship is limited to ASPE members and their immediate families who have a GPA of 3.0 or higher who are in or plan to attend a college, university, or technical school on a full-time basis (minimum 12 credit hours), enrolled in an engineering program. The application can be found on the [ASPE website](#). Up to \$5,000 in scholarship monies may be awarded each year to qualified applicants.

Julian Chiveral, LEED AP BD+C
Vice President- Technical

Water Efficiency Improvements Over the Years

A look at John Koeller's career path, the impact of MaP testing and WaterSense certification, then and now, and what the future holds.

October 2, 2023

As a professional engineer and engineering consultant, John Koeller, PE, principal of Koeller & Co., loves to solve problems and address issues related to water use efficiency and conservation. For the past 30 years, he's been doing just that.

However, he didn't start his engineering path in that sector. For the first 20 years (from 1973-1993) of his 50-year career, Koeller did environmental work in the United States for organizations such as the Army Corps of Engineers and private sector businesses.

In 1993, he switched career paths and moved into the water conservation and efficiency realm.

The move was motivated by a session on water he attended, which materialized into some water conservation and efficiency business. Simply put, "I found it fascinating," Koeller says.

For one of his first projects, he was contracted by the Metropolitan Water District of Southern California to oversee its toilet replacement program from 1993 to 1998. This involved the distribution of free, more-efficient toilets to address the drought issue in the region. The program intended to reduce water demands by replacing toilets using 3.5 gallons or more of water per flush with toilet fixtures that used no more than 1.6 gallons per flush, as mandated by California and the federal government's enactment of the Energy Policy Act of 1992.

The program involved purchasing and distributing up to 25,000 two-piece, 1.6-gallon toilets a month, which were given out to residential customers around Southern California. "Unfortunately, we later began receiving comments from a number of program participants complaining of poor flushing performance and, at that point, we realized we had purchased a lot of marginal product," Koeller recalls.

As Koeller explains, people didn't call the manufacturer to complain about the toilets; instead, they called the water utility that provided them. So Koeller and his team gathered some of the major water utilities together at an American Water Works Association meeting and informed them that a better system needed to be developed for measuring performance for flushing and leakage of the toilets being manufactured at that time. And that's how Maximum Performance Testing (MaP) was born.

In 2002, Koeller partnered with Bill Gauley, P.Eng, principal at Gauley Associates in Canada, to obtain funding from 22 water utilities in the United States and Canada and develop a program to test and rank toilet models for efficiency and flush performance.

"The water utilities commissioned us to develop a test that was more reflective of the real world than the certification test in the national product standard," Koeller says (see sidebar).

THE EVOLUTION

Koeller and Gauley's first MaP test report was released in 2003, revealing that half of all models tested failed the minimum 250-gram threshold for flushing waste.

"We thought that was the end of it," Koeller notes. However, the manufacturers whose toilets came out as poor performers said, "We can do better. If you test the new and improved toilet models we will bring into the marketplace, will you revise your report?" Of course, the answer was "Yes." As a result, the manufacturers developed hundreds of better-performing toilet models and almost all were MaP-tested.

Water Efficiency Improvements Over the Years

Initially, toilet models were MaP-tested at Gauley’s laboratory in Mississauga, Ontario, Canada, but it soon became apparent that it made more sense for new toilet models to be MaP-tested at the same location where they were being certified. Currently, 11 accredited laboratories in North America and Asia perform MaP testing.

When testing occurs, the results get sent to Koeller and Gauley, who report the flush performance results on their website www.map-testing.com.

“We post test results on our website and consumers can get the information free,” Koeller explains. “Water utilities can also use the information to create rebate programs. We’re the intermediary for communications purposes, you might say.”

Twenty years later, MaP testing is an ongoing process. Koeller and Gauley recently agreed to test products from their 189th manufacturer. “We have the flush performance results of well over 5,000 fixture models in our database; all of those results are freely available to the public,” Koeller says.

Water Consumption by Water-Using Plumbing Products and Appliances (1980 to 2023)

Water-using Fixture or Appliance	1980s Water Use (typical)	1990 Requirement (maximum)	EPAct 1992 Maximum	Baseline Model Plumbing Codes (maximum)	Green Code Maximums (Calgreen)	% Reduction in typical water use since 1980s
Residential Bathroom Lavatory Faucet	3.5+ gpm	2.5 gpm	2.2 gpm	2.2 gpm	1.2 gpm	66%
Kitchen Faucet	3.5+ gpm	2.5 gpm	2.2 gpm	2.2 gpm	1.8 gpm*	49%
Showerhead	3.5+ gpm	3.5 gpm	2.5 gpm	2.5 gpm	1.8 gpm	49%
Residential (“private”) Toilet	5.0+ gpf	3.5 gpf	1.6 gpf	1.6 gpf	1.28 gpf	74%
Commercial (“public”) Toilet	5.0+ gpf	3.5 gpf	1.6 gpf	1.6 gpf	1.28 gpf	74%
Urinal	1.5 to 3.0+ gpf	1.5 to 3.0+ gpf	1.0 gpf	1.0 gpf	0.125 gpf	96%
Commercial Lavatory Faucet	3.5+ gpm	2.5 gpm	2.2 gpm	0.5 gpm	0.5 gpm	86%
Food Service Pre-Rinse Spray Valve	5.0+ gpm	No requirement	1.6 gpm (EPAct 2005)	No requirement	1.28 gpm	74%
Residential Clothes Washing Machine	51 gallons per load	No requirement	26 gallons per load (2012 std)	No requirement	14 gallons per load (Energy Star)	73%
Residential Dishwasher	14 gallons per cycle	No requirement	6.5 gallons per cycle (2012 std)	No requirement	3.5 gallons per cycle (Energy Star)	75%

*Kitchen faucets may have a manual override that temporarily increases flow to 2.2 gpm max, and must default back to 1.8 gpm when the manual override is released.

Source: Modified from *The Drainline Transport of Solid Wastes Buildings*, by the Plumbing Efficiency Research Coalition (PERC), 2012. Chart updated by John Koeller and Peter DeMarco, 2018 and 2023.

“Our website has posted a lot of information over the last 20 years to help the public make smart purchasing decisions,” he adds. “However, the MaP program also has encouraged manufacturers to improve their products. Now, most of the products on the market perform exceptionally well. Some manufacturers were able to design a toilet to remove as much as 1,000 grams of soybean paste in a single flush. If you ever saw 1,000 grams of soybean paste, you’d be amazed any toilet could flush it. That, to me, was our contribution to the plumbing industry.”

WHERE WE ARE TODAY

Today, the American Society of Mechanical Engineers/Canadian Standards Association’s national product standard for a conventional toilet specifies a maximum water use of 1.6 gallons/flush; many states now mandate less — 1.28 gallons. That number stemmed from the Leadership in Energy and Environmental Design program’s initiative years ago to reduce water consumption by 20%.

Water Efficiency Improvements Over the Years

However, it didn't stop there for the MaP team. About seven years ago, it began identifying toilets that could perform as well with even less water – flushing at least 600 grams of waste while using no more than 1.1 gallons (4 liters) per flush. “We'd seen a lot of four-liter toilets that worked very well, and Gauley's 2005 drain line transport study found those lower-volume toilet models would work satisfactorily in typical residential dwellings,” Koeller notes. As a result, the MaP PREMIUM designation was created for those models.

The team took that information to the water utilities, which motivated many of them – including utilities in California, Denver, Seattle and Atlanta – to change their rebate programs to only rebate MaP PREMIUM toilets. “We currently identify more than 400 PREMIUM toilet models that meet those more rigorous requirements and are on the rebate lists in those regions,” he adds. (To see the list, visit www.map-testing.com/map-premium.) Incidentally, Koeller and Gauley are under contract for work on the Environmental Protection Agency (EPA) WaterSense program and the California Energy Commission Title 20.

“We believe we have significantly influenced the improvement of toilet flush performance and other factors over the past 20 years,” Koeller says. “Because of MaP testing and the competitive nature of the industry, many manufacturers were strongly motivated to engineer better-performing toilet models flushing with only 1.28 or 1.1 gallons/flush.”

Current Government Initiatives

In June, the EPA announced that it is considering revising the WaterSense Specification for Tank-Type Toilets, most recently updated in 2014. As a result, it is looking to reassess flush volume requirements, including the criteria for dual-flush systems to reduce the maximum allowed flush volume on the dual-flush toilet from 1.6 gallons to 1.28 gallons.

Dual-flushing toilets were developed to save water by allowing users to select a lower flush volume to remove liquid waste. If, however, users always choose the full-flush volume – which can be as much as 1.6 gallons – there is no water savings and, in fact, the toilet would use more water than a typical single-flush 1.28-gallon fixture, Koeller says. As such, it seems logical to remove the 1.6-gallon option for dual-flush models.

EXPANDING WATER USE HORIZONS

When asked his opinion on what has been the most significant milestone in the plumbing industry over the last 50 years, Koeller says: “Significantly reducing water consumption of water-using fixtures and fixture fittings while still providing consumer satisfaction was shown to be possible. The plumbing industry stepped up to reduce water consumption without sacrificing user satisfaction.”

What the future holds is unknown, but Koeller believes the focus will be on new products that expand the horizon in terms of water use and water efficiency. In his opinion, this includes leak detection equipment and systems, humidifiers and evaporative cooling (including cooling towers).

He also foresees initiatives in the green building and design community to flush toilets with treated greywater or other nonpotable water. “However, there is some conflict between what you deliver for a toilet flush versus for a bidet seat; that is, between treated greywater versus potable water.”

Koeller foresees the biggest impact on water use and water efficiency will come from improving outdoor water use. “The focus is already shifting away from indoor, recognizing that you can go only so low and you can't go much lower without risking affecting the function of the wastewater systems. Outdoors, there's a huge opportunity for water savings by whatever means – efficient irrigation, no irrigation, xeriscaping or turf removal.”

It's been an amazing beginning to the 2023-2024 ASPE Season! I would like to thank all the chapter members for entrusting me with the role of AYP Liaison on this wonderful board. I am excited to meet everyone and plan some intriguing and informative events for our AYPs.

If you have any thoughts or proposals for topics that interest you, please feel free to reach out to me. I'm looking forward to seeing all of you in October.

Best regards,
Nicole Murphy, Harry Eklof & Associates
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Chris Imhof, PE, CPD
Vice President – Legislative

Legislative Report

2024 ICC Codes

The 2024 International Plumbing Code and 2024 International Mechanical Code are now available online at the below links:

[2024 International Plumbing Code](#)

[2024 International Mechanical Code](#)

Other ICC codes are not available yet, including the International Building Code and International Fuel Gas Code.

NFPA 715 – Methane Detectors

The National Traffic Safety Board (NTSB) recently presented to ICC Code Action Committees regarding Methane Detector Standards. The NTSB is recommending that the ICC incorporate provisions that requires methane detection systems for all types of residential occupancies with gas service. The presenters suggested including NFPA 715 – Standard for the Installation of Fuel Gases Detection and Warning Equipment. You can review the standard here,

[NFPA 715 – Standard for the Installation of Fuel Gases Detection and Warning Equipment](#)

All NFPA standards are available to read online, free registration was is required.

Chris Imhof, PE, CPD
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 - Flow rates ideal for small to mid-sized design projects
- Self-diagnostic
 - Digital electronic control with 2-line LCD display
 - Programmable temperature setpoint
 - Easy setup/easy error coding
 - Upon power failure, holds last set temperature to avoid thermal shock

PROTON SERIES: MODEL FEATURES GUIDE				
	Proton 1.0	Proton 2.0	Proton 2.5	Proton 3.0
Simple and intuitive user commissioning and setup	•	•	•	•
Alarms for when unit maintenance is required	•	•	•	•
User programmable set point range between 65 °F and 180 °F	•	•	•	•
Automatic hot/cold water shutoff upon cold/hot water inlet supply failure	•	•	•	•
Valve controls at time of no use: 0.0 GPM*	•	•	•	•
Single valves available in 1" to 3" valve outlet sizes	•	•	•	•
Manifold assemblies available in up to 6" valve outlet sizes	•	•	•	•
Enhanced controller with programmable disinfection mode		•	•	•
Three additional temperature probes (inlet hot, inlet cold, return temp.)		+	+	•
Five relay contacts that switch on during alarm states		+	+	+
Remote alerts to assist Maintenance and Service Personnel		+	+	+
Loss of power alert		+	+	+
Broken temperature probe alert		+	+	+
"Out of range" temperature alert (± 10 °F)		+	+	+
Motor connectivity and operation alert		+	+	+
Service required @90% full shuttle movement alert		+	+	+
Enhanced controller with BACnet MS/TP connection			•	•
Enhanced controller with Wi-Fi				•

*When properly installed near the hot water source with a continuously operating recirculation pump

• Standard
+ Optional

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(LIT-067)



CLPB-2022
LIGHT COMMERCIAL
PRODUCTS
(LIT-048)



AD-2022-USA
ACCESS DOORS
(LIT-043)



BECO-2022
BACKFLOW PREVENTERS
AND ACCESSORIES
(LIT-071)



NH-2022-06
NO HUB COUPLINGS
(LIT-044)



TDPC-2023
POLYMER CONCRETE
TRENCH DRAINS
(LIT-076)



TD-2023
GRP & STEEL
TRENCH DRAINS
(LIT-046)



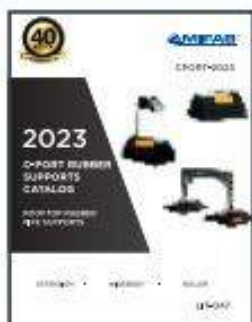
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SHOWER DRAINS
(LIT-077)



TDSS-2023
STAINLESS STEEL
TRENCH DRAINS
(LIT-072)



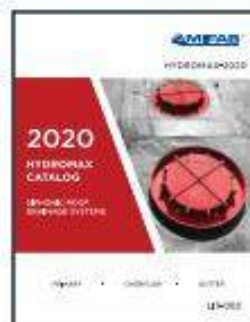
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Schedule of Events

SEPT 27	Communication Skills for Construction & Consulting	BJ Allen Warfel Construction
OCT 25	Vacuum System Design	Nikita Patel Sherman Engineering
NOV 16	Generator Basics	Jim Webster Kelly Generator & Equip.
DEC 13	Air Compressors	Will Dargan Cummins Wagner
JAN 24	Grease Interceptors	Schier Products
FEB 28	Fire Protection Specialties	Ken Isman University of Maryland
MAR 27	Fire Protection- Pre-Action Systems and Clean Agents	Josh Shapiro Reliable Sprinkler Co
APR 24	Siphonic Roof Drains	UV Systems
APR 2024	Annual Golf Tournament	Details to Follow
MAY 22	Natural Gas Sizing	Chuck Swope Mueller Associates ASPE Baltimore President
JUN TBD	Annual Summer Party	Details to Follow

MONTHLY
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OPPORTUNITIES

Tabletop Presentations: \$100 to provide a tabletop presentation of equipment or material relative to the plumbing profession. The tabletops will be set up from the beginning to the end of the monthly meeting and provides the opportunity to provide a brief (under 5 minutes) presentation.

Please make checks payable to the Baltimore Chapter of ASPE. Contact Kathy Dwyer or Chuck Swope if interested