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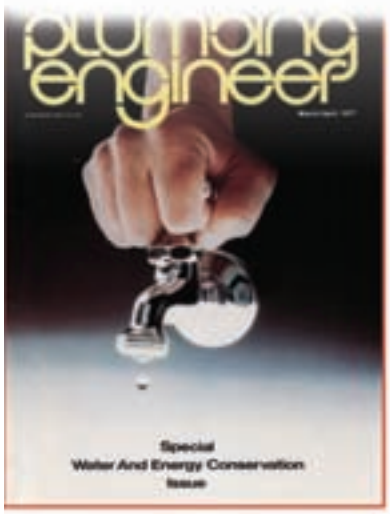
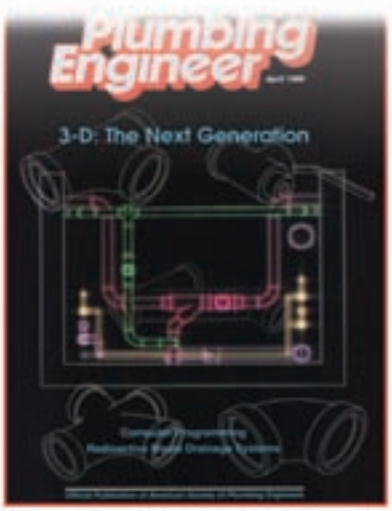
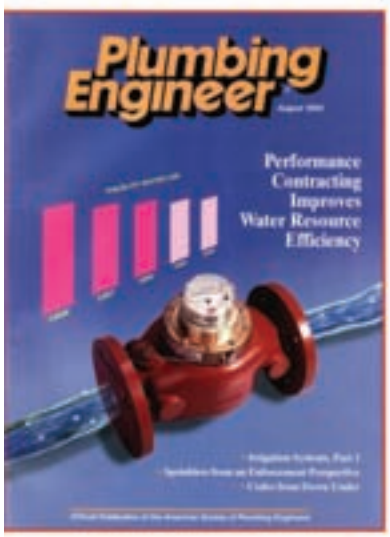
Plumbing Engineer

THE OFFICIAL PUBLICATION OF THE AMERICAN SOCIETY OF PLUMBING ENGINEERS

JUNE 2012







40th ANNIVERSARY ISSUE

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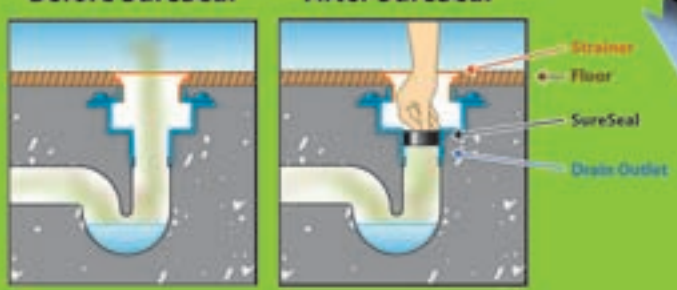

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Circle 1 on Reader Reply Form on page 65

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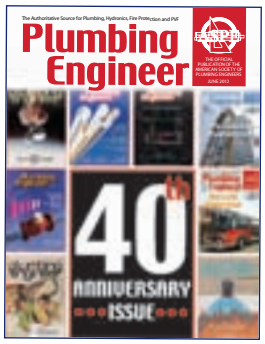
Circle 2 on Reader Reply Form on page 65



Plumbing Engineer®

A TMB Publication

THE OFFICIAL PUBLICATION OF THE AMERICAN SOCIETY OF PLUMBING ENGINEERS

Volume 40, Number 6, June 2012

INSIDE THIS ISSUE

FEATURES

ASPE REPORT

COLUMNS

DEPARTMENTS

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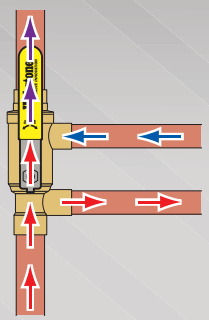
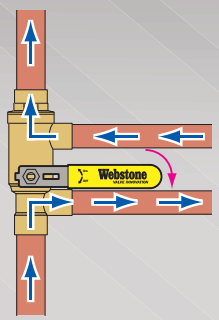


Hydraulic Separation



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Circle 3 on Reader Reply Form on page 65

From the Desk of Tom Brown

Hindsight, and a look ahead to the future of Plumbing Engineer magazine

Debut issue of Plumbing Engineer, September/October 1973.

Welcome to a very special issue of *Plumbing Engineer*. As you may have noticed, in addition to our normal complement of departments and features, this issue includes two very special sections covering the magazine's 40th anniversary and some of the country's top engineering projects for 2012. I hope you'll take some time to read the noteworthy letters of commendation our readers, advertisers and industry notables submitted for this issue as they reflect on where the industry has come from, where it may be headed and the large role that *Plumbing Engineer* will play as the years go on.

Throughout my tenure as publisher and owner of *Plumbing Engineer*, I've had the good fortune of making many friends within the industry. Folks such as Phil French, the late Don Dickerson, Jim Kendzel, William F. Hughes and many others have proven themselves to be consummate professionals and just as dedicated to the industry as I and my staff have been.

Since I purchased the magazine in July 1990, it has become an even greater success, averaging more than 250 ad pages per year, making *Plumbing Engineer* a strong commercial success. Much of that is attributed to the loyalty of our advertisers — some of whom have been advertising in the magazine since 1973 —and to our dedicated staff of professional editors, designers, columnists and sales representatives. Another reason is the magazine's unfettered editorial policy, which allows us to continually provide our readers with important business and technical information for those involved in the design and specification of plumbing systems. And it appears that we're doing that job well. *Plumbing Engineer's* reader fulfillment percentage is at an all-time high and recent surveys indicate that the magazine has maintained its editorial leadership and direction.

After being associated with the magazine for many decades, as publisher and owner, I look back with pride at the magazine's growth and service to the engineering community. We at TMB Publishing are humbly grateful for all of your support and continued patronage, and we look forward to serving you for the next 40 years. ■

PLUMBING ENGINEER
(USPS 567-950)
ISSN 0192-1711

PLUMBING ENGINEER (USPS 567-950) ISSN 0192-1711 is published monthly by TMB Publishing Inc., 2165 Shermer Rd., Suite A, Northbrook, IL 60062. Phone (847) 564-1127, Fax (847) 564-1264. Magazine is free to those who design and specify plumbing/piping systems in commercial, industrial, institutional and governmental buildings; as well as government officials and plumbing inspectors. Subscription rates for U.S. and Canada: $50 for one year, $90 for two years. Other countries: $300 per year. Periodical postage paid at Northbrook, IL, and additional mailing offices. POSTMASTER: Change of address should be sent to ***Plumbing Engineer***, 440 Quadrangle Dr., Suite E., Bolingbrook, IL 60440. Material and opinions contained in contributed articles are the responsibility of the authors, not of TMB Publishing Inc., *Plumbing Engineer* magazine or its Editorial Advisory Board. The publisher cannot assume responsibility for any claims made by advertisers.

Volume 40, Number 6. *Plumbing Engineer* is microfilmed by University Microfilms, Ann Arbor, MI, and indexed by Engineering Index Inc. Publications Mail Agreement No. 41499518. Return Undeliverable Canadian Addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill ON L4B 4R6

Plumbing Engineer
A TMB Publication

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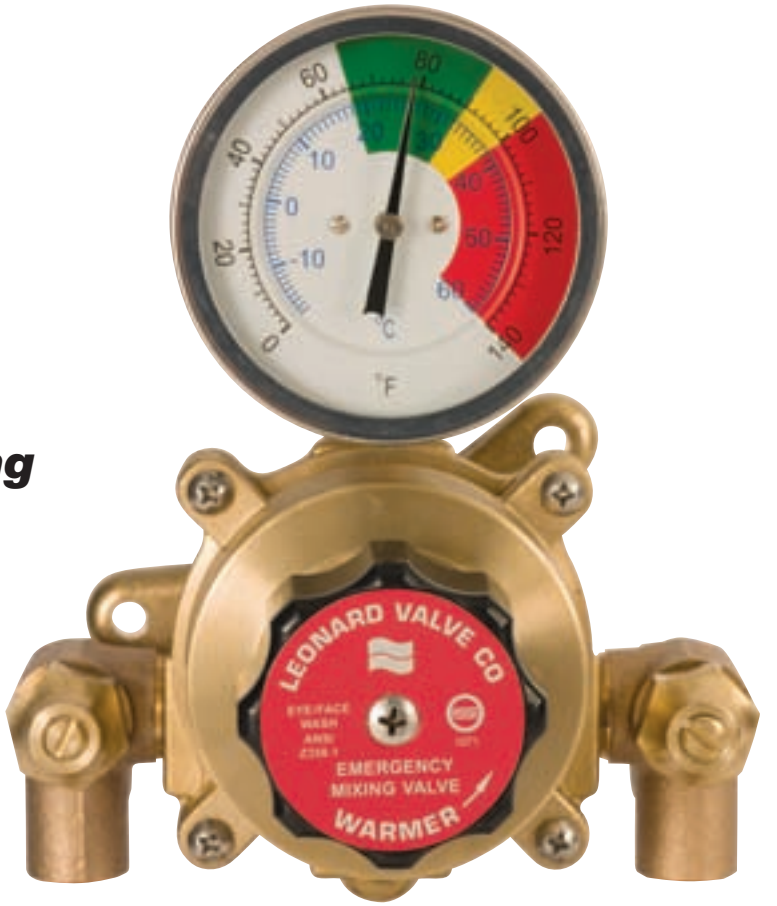
Leonard Valve Emergency Mixing Valves...

Meeting the ASSE Standard 1071 Since the Beginning



Leonard Valve's series of emergency mixing valves provide quality and performance, plus they have been certified to ASSE 1071 since 2009.

The ASSE Standard 1071 was developed to work with systems that comply with ANSI Z358.1 (2009) for emergency equipment (i.e. eye/face wash and drench showers). It added a logical assurance that emergency mixing valves provide tepid water to the emergency devices.

A key performance requirement was Cold Water Failure, Section 1.2.6, stating that "upon cold water failure, the hot water shall continue to flow at a rate not to exceed the values listed in Table 1."

Leonard always published our bypass flow rates. We've always had your tempered water needs covered.

Leonard's emergency mixing valves utilize our DURA-TROL® bi-metal, the most durable and fastest reacting thermostats in the industry. Precise water temperature control is what you can expect from Leonard Valve.

Have a question about this standard? Call our free technical support hotline at **888.797.4456** or visit our new website, **www.leonardvalve.com.**

Table 1

Flow @ 30.0 psi ± 0.5 psi (206.9 kPa ± 3.4 kPa) differential		Permissible temperature variation above or below set point		Maximum allowable flow with cold water shut off	
GPM	**L/min**	**ºF**	**ºC**	**GPM**	**L/min**
<7.0	<26.5	+3.0/-5.0	+1.7/-2.8	0.5	1.9
7.0<20.0	<26.5<75.7	+5.0/-8.0	+2.8/-4.4	1.0	3.8
20.0<40.0	<75.7<151.4	+7.0/-12.0	+3.9/-6.7	1.5	5.7
40.0 and over	Over 151.4	+7.0/-15.0	+3.9/-8.3	2.0	7.6

DURA-trol® bi-metal thermostat

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Circle 4 on Reader Reply Form on page 65

Industry News

NSF International and the American Society of Plumbing Engineers Partner to Advance Public Health and Sustainability Efforts in Plumbing

ANN ARBOR, Mich. and DES PLAINES, Ill. — NSF International and the American Society of Plumbing Engineers have signed a Memorandum of Understanding (MOU) to advance and promote public health and sustainability initiatives within the plumbing industry. The MOU impacts the design, specifications, installation, inspection and regulation of plumbing systems.

NSF International is an independent global organization that writes public health standards and protocols, and tests and certifies products for the water, food and consumer goods industries. This includes developing multiple American National Standards and certifying a wide range of plumbing and water treatment products. Products bearing the NSF Mark demonstrate compliance with national standards and utilize innovative water treatment technologies.

The American Society of Plumbing Engineers (ASPE) is the international organization for professionals skilled in the design, specification and inspection of plumbing systems. ASPE is dedicated to the advancement of the science of plumbing engineering, to the professional growth and advancement of its members and the health, welfare and safety of the public.

Under the MOU, NSF International and ASPE will write standards that benefit public health and the environment by supporting each other's missions: to advance the science of plumbing engineering and human health. This will be accomplished by jointly developing educational resources in addition to promoting conferences and publications that highlight water quality and conservation.

"Over the years, NSF International has earned high marks for credibility in serving the needs of public health and safety," says ASPE Executive Director/CEO Jim Kendzel, MPH. "NSF is at the cutting edge of providing conformity assessment programs that serve the current and future needs of the plumbing industry, and ASPE is proud to join with NSF to help meet those needs and ensure that safer, more efficient water and wastewater delivery and treatment systems are used worldwide."

"Together ASPE and NSF International have the expertise and knowledge to promote and educate others about the importance of innovation and sustainability within the plumbing industry. I look forward to the opportunities that our partnership will provide to further advance and protect public health on a global scale," said Nasrin Kashefi, General Manager of NSF International's Plumbing Program.

To learn more about NSF's plumbing programs contact Ellen Van Buren at 734-827-3822 or vanburen@nsf.org or visit NSF's website. You can also email europe@nsf.org, asia@nsf.org, brasil@nsf.org and info@nsf.org.cn (China) for additional information.

New Pro-Pal brochure available

WORCESTER, MASS. — A new edition of Webstone's Pro-Pal brochure showcases a wide array of labor saving products for the plumbing and heating trades. Learn how to save time and money by choosing step saving Webstone products over traditional labor intensive alternatives.

Webstone is known for innovative design of residential and commercial valves used in plumbing, hydronic, radiant, solar and geothermal applications. These designs focus on time and space saving concepts that simplify future maintenance and upkeep of all piping systems.

NFPA launches campaign to recruit code enforcers to technical committees

QUINCY, MASS. —The National Fire Protection Association (NFPA) has more than 200 technical committees, which create and revise codes and standards that protect people and property and has launched a recruitment campaign to increase the number of code enforcers participating on the committees. NFPA seeks to have code enforcers represent at least 20 percent of the overall technical committee membership by 2013.

"One of the greatest strengths of the NFPA standards development process is broad participation. We work extremely hard to ensure we have a balance of interests on these committees," said NFPA president James Shannon. "We need code enforcers because they have particular knowledge and experience on how our codes and standards are applied in the field. We need them to provide their expertise to the important work that is being done by our technical committees in order to advance our safety mission."

Recent cuts in municipal budgets, including elimination of travel expenses for public employees, have made it harder for code enforcers to participate in technical committee meetings. In response to this concern, NFPA created a special fund to subsidize 80 percent of travel and lodging expenses that may come when code enforcers participate. Assistance with these expenses is available to code enforcers who are public employees or part of the volunteer fire service.

NFPA recently conducted a survey of current technical committee members and found a high level of satisfaction in participants. For code enforcers, participating

More Industry News on page 10

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U.S. GREEN BUILDING COUNCIL MEMBER

Circle 5 on Reader Reply Form on page 65

Continued from page 8

in NFPA technical committees can provide an opportunity to help improve safety, a chance to network with other code professionals and a way to learn more from industry experts. In return, committee members are asked to participate in approximately 10 meeting days over a three- to five-year period, sharing their expertise and individual perspectives.

To learn more about the benefits of joining an NFPA technical committee and to apply online, code enforcers can go to www.nfpa.org/enforcers

T&S Brass expands social media presence

TRAVELERS REST, S.C. — T&S Brass recently expanded its social media presence with an enhanced Facebook page, which is designed to serve as a resource for and to open a dialog with plumbing and foodservice customers, representatives, distributors, wholesalers, consultants, engineers, specifiers and end users.

To encourage likes and content submission to the page, T&S is also launching a monthly Facebook contest series. Customers, end users and industry professionals are encouraged to submit photos of their T&S installations. A winner, chosen each month from those who submitted content, will receive a $50 Visa gift certificate. More details can be found at www.facebook.com/tsbrass.

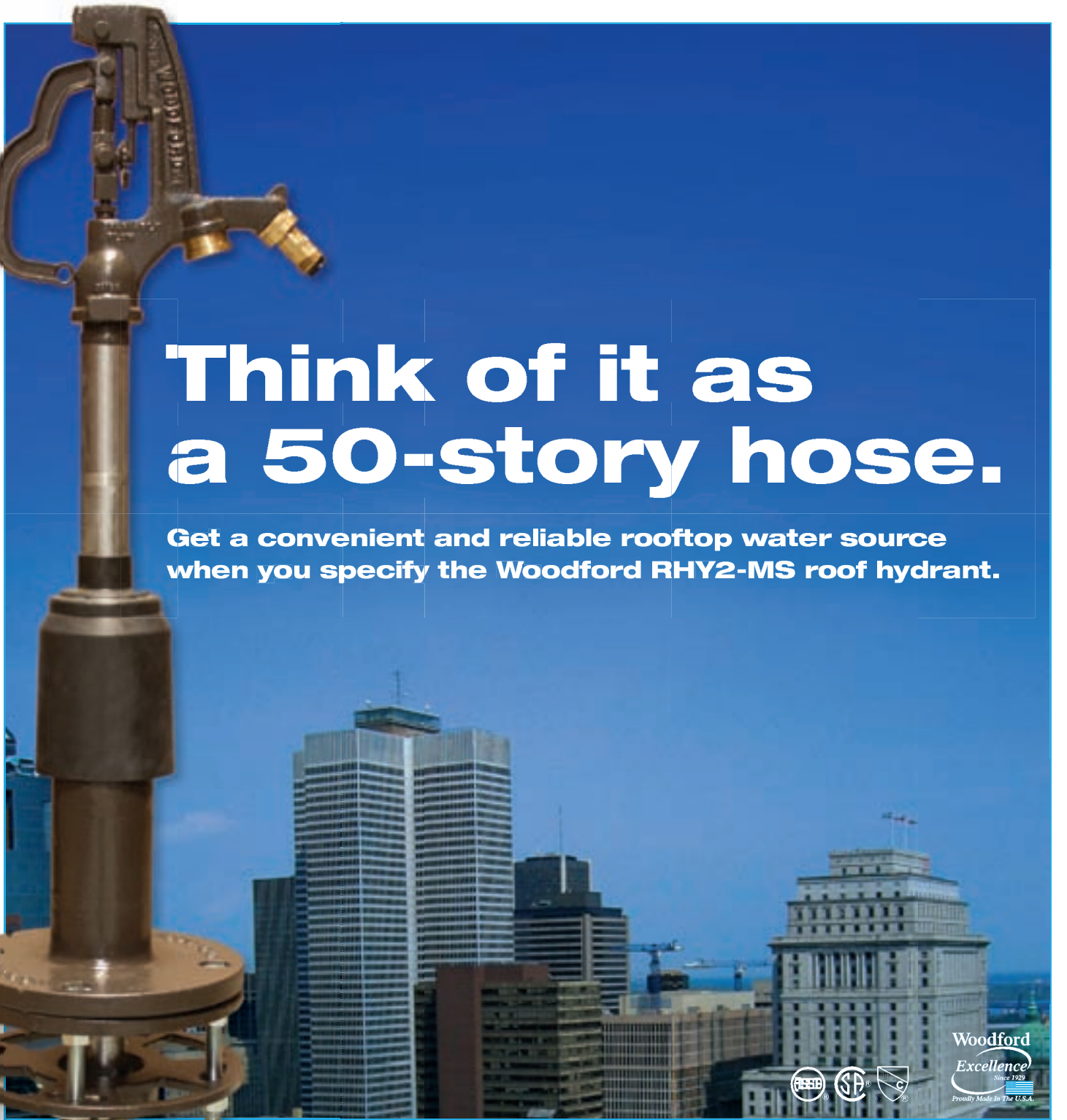
The new Facebook page comes as a complement to the company's other social media outlets, including Twitter (@tsbrass), LinkedIn and a YouTube channel (http://www.youtube.com/tsbrassvideos). It will focus heavily on the needs and interests of customers, highlight the company's thought leadership, educate the market and demonstrate what it's like to work with T&S, while showcasing the company's personality and lighter side.

The site will also serve as a platform through which T&S can help promote issues core to its corporate values, such as sustainability and water conservation, LEED and improved cleaning power and hygiene.

RPA meeting slated for Sept. 18 in Chicago

MOKENA, ILL. — The Radiant Professionals Alliance (RPA) will hold its annual Membership Meeting and Conference in Chicago on Tuesday, Sept. 18. This conference will be co-located with Penton's Mechanical Systems Week, giving RPA members and other mechanical industry leaders the opportunity to gather for networking, education, professional recognition and the advancement of radiant/hydronic technologies.

More industry news on page 12



Engineered for quality and durability, the Woodford RHY2-MS is perfect for washing down cooling towers, cleaning condenser coils or providing water for window washers and other types of roof equipment. The hydrant support allows for installation flexibility, while its unique mounting system secures above and below the roof deck, providing exceptional strength and security. It also comes with a 2-degree shim for pitch adjustment. Featuring ASSE 1052 backflow prevention and Woodford's freezeless technology, the RHY2-MS makes getting water on the roof easier than ever before.

For more information, visit WoodfordMfg.com.

WOODFORD

The choice of professionals.

Circle 7 on Reader Reply Form on page 65

Continued from page 10

Conference attendees will enjoy two education sessions, a general membership meeting, an open board meeting and an early evening reception, where the winners of the 2012 System Showcase competition will be announced.

In addition to the two educational seminars, the RPA will present seminars for Mechanical Systems Week and will host a booth in the Mechanical Systems Week Expo. The RPA has signed on as an endorsing partner in Mechanical Systems Week, Sept. 19 – 21, at the Schaumburg Convention Center in Schaumburg, Ill., which offers significant benefit to RPA's members, including a 15 percent discount on Product Showcase booth space, reduced conference registration of $300 (regular rate is $495) and a hotel room block rate of $159.

This must-attend event includes a showcase of business and technical seminars, product displays, hands on training, networking and social events and special keynote speakers for the national HVAC/R, hydronics and plumbing industries.

Save the date or register now for the RPA Membership Meeting and Conference (separate from Mechanical Systems Week registration). The registration fee is $125 for RPA members, $150 for non-members. To receive the special discounts for Mechanical Systems Week, go to www.radiantprofessionalsalliance.org and click on the annual conference link.

For more information about the RPA's Membership Meeting and Conference or all other activities associated with the RPA, contact the director by email, Kathleen.Mihelich@RadiantProfessionalsAlliance.org, by phone, 708/ 995-3003 or by mail at 18927 Hickory Creek Drive, Suite 140, Mokena, IL 60448.

Sloan white paper compares benefits and environments for different types of valves

FRANKLIN PARK, ILL. — Sloan has issued a white paper that discusses the differences between diaphragm and piston valve flushing technologies and includes charts that show under which operating conditions to specify one type over the other.

"Diaphragm and piston flush valves each have their strengths and are best suited for different environmental conditions," says Mike Gipson, Flushometer product line manager for Sloan. "It's important to assess the environment before choosing to install diaphragm or piston technology."

In addition to illustrating the mechanical differences between diaphragm and piston flushometers, the white

More Industry News on page 62

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Circle 9 on Reader Reply Form on page 65

Plumbing Engineer celebrates 40 years of editorial excellence!

In the fall of 1973, a new trade magazine came onto the engineering scene. Developed to provide plumbing engineers and designers with industry specific information, *Plumbing Engineer* has continued to perform that service for 40 years. Initially published every other month, the magazine was supported by advertisements from more than two dozen manufacturers of plumbing products, many of whom to this day are still loyal supporters of the magazine.

The first issue of *Plumbing Engineer* was introduced by then-ASPE president George W. Runkle, Jr., who wrote:

"One of the goals of *Plumbing Engineer* is to dispel the misunderstanding of what the plumbing engineer and designer actually do. In the coming issues of *Plumbing Engineer*, there will be articles on actual installations, test results from research projects, scientific data, questions and answers on design and code problems, etc., all presented in a manner that will permit them to be used as tools of the profession.

"Of course, as in all professions, there is a continual learning process involved in being more than a successful engineer or designer. There are more and more new systems, materials, methods, requirements, etc. being developed each day. *Plumbing Engineer* will not only present them for your information and guidance, but will welcome your comments and experiences."

In the years that have followed the inaugural issue, that promise has been delivered upon issue after issue. As satisfying a record as that is to look back upon, it is the people comprising the industry and engineering profession that give it life and definition. Therefore, it is fitting that we take the ocassion of this 40th anniversary of *Plumbing Engineer* to give some of our readers, advertisers and contributors the opportunity to reflect on the magazine over the past several decades, and into the future.

THE LEGACY OF PLUMBING ENGINEER speaks volumes. While Chicago Faucets is a few years older (celebrating its 111th anniversary in 2012), both entities have successfully weathered a myriad of challenges in their commitment to providing the plumbing engineering profession with products that are necessary for success.

John Fitzgerald
Vice President - Marketing
The Chicago Faucet Company

"On behalf of everyone at Leonard Valve, we want to congratulate everyone on the Plumbing Engineer team on your publication's 40-year anniversary. More importantly, we want to thank you! Thank you for your 40 years of being dedicated to our industry and for being committed to enhancing our industry with riveting editorials on design trends and innovative products. We at Leonard believe it is critical to continue to develop new and emerging technologies to aid the specifying engineers in their domestic hot water designs. Working with Plumbing Engineer has been the vehicle that has enabled us to communicate our water temperature control solutions from our drawing boards and into commercial plumbing designs. Again, we congratulate and thank you for your years of dedication and service to our industry."

Peter Gobis
National Sales Manager
Leonard Valve Company

Plumbing Engineer magazine has done much more for our industry than any other publication. It offers exceptional columns by some of the industry's most respected engineers and brilliant features by knowledgeable contributors. It is offered free to industry professionals and is supported through advertising by every major product line in the plumbing world. It is the official publication of ASPE and provides clear and concise updates needed by thousands of its members. There is one aspect of Plumbing Engineer that makes it stand out from every other publication: Simply stated, it has raised the status of plumbing engineers in the design community.

While other publications consider plumbing as a sub-set of mechanical engineering, Plumbing Engineer has provided an exclusive magazine for plumbing professionals. It has recognized the expertise of our profession and created an outlet for us to share with one another. It has asked manufacturers to stand up and take notice of its targeted audience. It has made readers understand the essential service that we provide, with the complexity that only a plumbing engineer could appreciate. For this dedication to us and our profession, Plumbing Engineer magazine should be congratulated on forty years of tireless service to our industry.

Peter Kraut, P.E.
President
South Coast Engineering Group

After 40 years, Haws is proud to continue to support Plumbing Engineer. Plumbing Engineer is a vital resource to the plumbing community, and we value our relationship with the magazine and its staff. We congratulate the Plumbing Engineer team on reaching such a significant milestone, and we look forward to many more years.

Katy Loos
Corporate Communications
Haws Corporation

Congratulations to Plumbing Engineer on its 40th anniversary! For most of those years Plumbing Engineer has been the "Official Publication of the American Society of Plumbing Engineers" and, as such, has been an integral part of plumbing engineers' and designers' educational lives.

Plumbing Engineer has had a tremendous impact not only on the plumbing engineering profession but also on the plumbing industry as a whole in that in those 40 years Plumbing Engineer has had many diverse contributors encompassing every aspect of our profession. The technical and educational material has been and is second to none. Our members benefit beyond expectations. I might add that it is a benefit that is free of cost to members of ASPE. Plumbing Engineer is most certainly the "premier" of publications associated with our profession.

It is encouraging to see the renewed partnership between Plumbing Engineer and ASPE. As a result, we can be assured that we will continue to receive technical and educational material that is directed to what we do. We are plumbing engineers, and Plumbing Engineer speaks directly to us.

Again, congratulations to you and your staff for a job well done.

Philip L. French, P.E. FASPE
Past President, ASPE

On behalf of the Jay R. Smith Mfg. Co., a member of Morris Group International, we would like to congratulate the whole team at Plumbing Engineer for serving the plumbing community well these past 40 years. Your 40th anniversary is a testament to the quality of Plumbing Engineer magazine and the excellent staff that guides the industry in support of plumbing engineers and manufacturers. From an 86-year old company to a 40-year old company, may the best years be ahead of you. Thank you for all that you do to support us all.

Charles S. White
Vice President Marketing, LEED AP, MBA
Jay R. Smith Mfg, Co.

It has been our pleasure, here at Precision Plumbing Products, to work with the professionals at *Plumbing Engineer* magazine. For the past 30 years Precision has developed advertising formats that have grown our business and a great deal of credit for that growth has been our relationship with *Plumbing Engineer* and the audience they serve. The editorial staff that produces one interesting article after another and the very attentive and professional staff members like Diane Spangler that prepare effective advertising programs year after year. Congratulations on 40 years of success! And thank you for your dedication to the plumbing industry. We at Precision Plumbing Products wish you continued success over your next 40 years.

Jack Vilendre
President
JL Industries, Inc.

ASPE REPORT

AMERICAN SOCIETY OF PLUMBING ENGINEERS

From the President's Pen

William F. Hughes Jr., CPD, LEED AP, FASPE
2010-2012 ASPE PRESIDENT
aspepres@aspe.org

Monday, April 30, 2012 was a historic day for the plumbing industry.

On that day, the inaugural meeting of the Plumbing Industry Leadership Coalition was held in Washington, D.C. at the National Institute of Building Sciences. ASPE Executive Director/CEO Jim Kendzel, MPH, CAE, and I represented ASPE at this meeting, and also in attendance were the executive directors and other leaders of key industry associations and stakeholder groups.

The main purpose of the meeting was to assemble this group of important industry representatives to determine their interest in unifying to promote industry-related issues. The establishment of a coalition of key groups and others within the plumbing industry would allow all stakeholders to have a unified voice on specific matters and issues affecting our industry.

Three groups, and specifically three individuals, were responsible for organizing this monumental industry event.

- Plumbing Manufacturers International (PMI), Executive Director Barbara C. Higgens
- International Association of Plumbing and Mechanical Officials (IAPMO), Chief Executive Officer GP Russ Chaney
- American Society of Plumbing Engineers (ASPE), Executive Director Jim Kendzel

The meeting started with a presentation by National Institute of Building Sciences President Henry L. Green, Hon. AIA, who spoke about the NIBS and its role in the construction industry. Part of Henry's presentation was a forecast of where he and his staff see the construction industry heading and what role NIBS has in the process.

Next, the attendees discussed the reasons and need for establishing a plumbing industry coalition. They also discussed how to establish leadership within the coalition and how to implement the actions of the group. The quality of the dialogue and the interaction among the attendees were critical to gaining insight into the interest in creating this coalition.

The No. 1 topic of the entire discussion centered on the most important question: Does everyone in attendance see the need for such a coalition within the industry? The next most important question was: Do you and your organization want to be part of such a coalition?

The answer to both questions was an overwhelming yes. Granted, several details and logistics still need to be worked out, but getting everyone in attendance to say that they saw a need for such a coalition was the first step in the process. Having a unified voice of associations and stakeholders representing the industry as a group only reinforces our position and voice on important issues. An example of how this coalition can affect the industry is the potential public health concerns with hands-free faucets. As you might remember, ASPE took the lead in bringing together stakeholders in the plumbing industry to address this issue.

Another key discussion item was the agreement that not all topics will be relevant to all of the organizations within the coalition and that those organizations do not have to be part of that specific issue. Only at the discretion of the organization will they participate in a specific issue.

Representatives from the following organizations attended the meeting:

- Alliance for Water Efficiency
- American Society of Plumbing Engineers
- American Society of Sanitary Engineering

- American Backflow Prevention Association
- American Rainwater Catchment Systems Association
- Copper Development Association
- International Association of Plumbing and Mechanical Officials
- Mechanical Contractors Association of America/Plumbing Contractors of America
- National Institute of Building Sciences
- Plastic Pipe and Fittings Association
- Plumbing-Heating-Cooling Contractors Association
- Plumbing Manufacturers International
- United Association
- Water Quality Association

Other organizations that were not able to attend this inaugural event due to scheduling conflicts were the Cast Iron Soil Pipe Institute, International Code Council, and Plumbing and Drainage Institute. Moving forward, other organizations and stakeholders will be invited to join this coalition.

Media representatives from Contractor Magazine, Plumbing & Mechanical Engineer magazine, and Plumbing Engineer magazine also were at the meeting.

I am honored to have been in attendance with such an elite group of industry leaders, and I am looking forward to continuing to network with each of the organizations as necessary to sustain the momentum and development of this important industry coalition. Only as a unified group can we have a voice that will benefit all of us in this great industry. ***ASPE***

New ASPE Members

Atlanta Chapter
Amanda C. Askew, EIT
Brandon Derryl Gavins
Gregory Mark Turner

Baltimore Chapter
Michael John Morrissey, PE, GE, LEED AP, HFOP

Boston Chapter
John Dodge
Christopher Thomas Maskwa, GE

British Columbia Chapter
Kenneth E. Marks
Xuefeng Zhang

Central Florida Chapter
Jennifer Lynn Schmidt

Central Ohio Chapter
Jerry Alan Worthington

Charlotte Chapter
David Albert Barbee

Chicago Chapter
Qazi Mohammed Sohaib
Chris M. Watson

Connecticut Chapter
James Gerald Kowalski, PE

Denver Chapter
Denis J. Miller, PE

Houston Chapter
Christopher Best

Long Island Chapter
Jaymus John Burke

Los Angeles Chapter
Mei Kwan, GE
Guru Singh

Member at Large
Sergiy Franchuk
Stanley Funk
David V. Harbison Jr.
Kevin Koubek, PE
Mark Meredith

Miami Chapter
Ilyse Forman

Minnesota Chapter
Peter Michael Dzubay

Montreal Chapter
Jean-Sebastien LaBerge

New York City Chapter
Joseph Pawell

North Florida Chapter
Sam Diperna

Omaha Chapter
Daniel A. Hellige

Orange County Chapter
Stephen Haines

Overseas Chapter
Clint Alain Minoza D'Lonsod

Phoenix Chapter
James H. Brown, PE
Paul Hardin Pennington

Rochester Chapter
Brian Somers, PE

Seattle Chapter
Jason Martin F. Hall
Jase Rouleau

Southwestern Ohio Chapter
James Michael Renner

St. Louis Chapter
Leslie Cowger
Kelly Diane Dedeke, GE

Western Michigan Chapter
Chad Sanborn

From the Executive's Desk

Jim Kendzel, CAE, MPH
ASPE EXECUTIVE DIRECTOR
jkendzel@aspe.org

ASPE has been very busy lately working to achieve our strategic objectives of promoting the plumbing engineer profession and helping ensure that plumbing codes and standards are based on sound engineering practices. Here is some of our recent activity.

Codes and Standards

On April 20, Edward W. Saltzberg, PE, CPD, FASPE, represented ASPE at the IAPMO Green Technical Committee meeting in Chicago. At the ICC code hearings the week of April 29, ASPE had voting representation on both the plumbing and mechanical code committees thanks to our two liaison members: ASPE Vice President, Legislative David E. DeBord, CPD, LEED AP, ARCSA AP, and James Paschal, PE, CPD, LEED AP. More than a few ASPE members also were present and actively participated in the discussions.

ASSE has made great strides in the development of ASSE 6000: *Professional Qualifications Standard for Medical Gas Systems Personnel,* and Mark Allen of BeaconMedaes is representing ASPE in that project. ASPE also has been actively involved on the committee providing recommendations for ASHRAE Guideline 12: *Minimizing the Risk of Legionellosis Associated with Building Water Systems.* The task committee for Chapter 4: Plumbing Systems has completed its work, and a draft should be available for public comment soon.

Leadership on a Global Scale

As noted in the "From the President's Pen" column, ASPE recently participated in the inaugural meeting of the Plumbing Industry Leadership Coalition. The meeting was a tremendous success, and we are anticipating exciting new industry dialogue and initiatives to come from this illustrious group of industry leaders.

Dave DeBord recently returned from a trip to Bogota, Colombia, where he represented ASPE at a conference on hydrology. Thanks go to our friends at ICC who reached out to ASPE for representation at the conference and also covered all expenses associated with Dave's trip.

I recently represented ASPE at the World Plumbing Council meeting in Beijing, China. The opportunity to network with plumbing industry representatives from around the world is priceless, and it is critical for ASPE to have an impact on global plumbing engineering principles.

Through our recently signed MOU with the Canadian Institute of Plumbing & Heating, we have formed a committee of Canadian and American engineers, contractors, product manufacturers, and wholesalers to provide recommendations related to the development of quality job specifications. The committee plans to present the results of their discussions at the 2012 ASPE Convention & Exposition in Charlotte, North Carolina on October 27–31.

Research Initiatives Have a Positive Impact

ASPE RF President Julius A. Ballanco, PE, CPD, FASPE, presented data from the recently completed testing on roof drainage systems at the ICC code hearings in Dallas. It is hoped that the data will provide technical support for needed code changes. The project was co-sponsored by IAPMO, and the final report is near completion.

ASPE RF board member Max Weiss is chairing a task group that is developing a research protocol to evaluate the impact of faucet system design (both manual and electronic) on biofilm development. As a result of ASPE's leadership role in this area, I was asked to moderate a panel discussion among distinguished experts in the area of plumbing and pathogenic issues in building water systems at the IAPMO/WPC Emerging Technology Symposium in Washington, D.C. in May.

The ASPE RF also has a new research initiative designed to evaluate the impact of food waste disposers on combination waste-and-vent systems. Curtis A. Ray Jr., CPD, is the project leader. The results of this research should assist in determining how to best set code requirements pertaining to these systems.

ASPE, as a member of the Plumbing Efficiency Research Coalition, has been actively supporting research on drainline transport both financially and through member involvement. The testing is close to being completed, and we are pleased to say that Pete DeMarco, IAPMO director of special projects and the lead on this project, will be presenting the results of the study at the 2012 ASPE Convention & Exposition.

Wow, ASPE has been busy representing the profession! We hope that you will continue to support these efforts with an understanding that the investment ASPE makes to actively impact the future of our industry is well worth it from a long-term return on your investment.

PS: I would like to thank ASPE Life Member Raymond Lynch, PE, FASPE, for his letter of support for our renewed partnership with *Plumbing Engineer* and his praise for the quality of the publication. Thanks also go to all of the other ASPE members who have provided positive feedback related to our relationship with the magazine. We could not be more pleased with the progress we have made with our partner, TMB Publishing, and their support of ASPE!

Don't forget to follow me on Twitter: @aspeexecceo. ASPE

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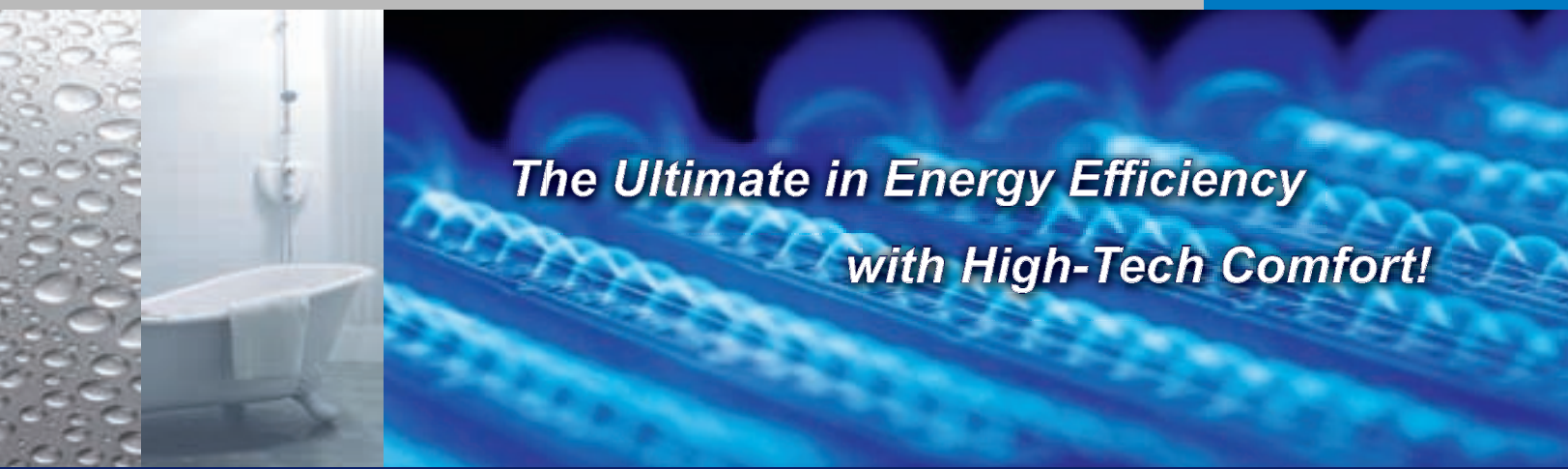

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Three Highly Qualified Engineering Students Receive Steele Scholarships

This year, ASPE awarded Alfred Steele Scholarships to three deserving students pursuing degrees in engineering: Elizabeth and Veronica Mende and Jingyu Lee.

Twins Elizabeth and Veronica both graduate this month from Will Carleton Academy in Hillsdale, Michigan with 4.0 GPAs, and each received $1,000 toward their first year at Kettering University in Flint, Michigan. In the 2011–2012 school year, Elizabeth was vice president of the Student Council and a member of the National Honor Society, and she is an active volunteer member for various church activities. Elizabeth is majoring in mechanical engineering at Kettering. Veronica, who is majoring in biomechanical engineering, was a class representative of Student Council and a member of the National Honor Society and also actively volunteers for church activities.

Jingyu Lee, a student member of ASPE, attends Illinois Institute of Technology with a triple major in architectural engineering, civil engineering, and architecture. He has a 3.89 GPA and has been on the Dean's List for seven consecutive semesters. Jingyu is vice president and webmaster of ASHRAE IIT and cofounder and vice president of the Structural Engineers Association of Illinois Student Chapter.

Congratulations Elizabeth, Veronica, and Jingyu!

ASPE Research Foundation Elects New Board of Directors

At its annual meeting, the ASPE Research Foundation held formal elections for the 2012–2013 fiscal year. The following individuals were elected to serve on the board:

- Julius A. Ballanco, PE, CPD, FASPE, President
- David H. Anelli, Vice President
- William N. Erickson, Vice President
- William F. Hughes Jr., CPD, LEED AP, FASPE, Vice President
- Curtis A. Ray Jr., CPD, Vice President
- Max Weiss, Vice President
- Stanley Wolfson, Vice President
- Carol L. Johnson, CPD, LEED AP, Treasurer
- Jim Kendzel, MPH, CAE, Secretary

"The work that we have been doing and plan on doing is so critical to ensuring that plumbing system design is based on sound engineering and scientific principles, and we appreciate the financial donations that we receive from ASPE members as well as others in the plumbing community," Ballanco says. "It is through their financial support that we are able to produce such important research." ***ASPE***

Read, Learn, Earn

Do you find it difficult to obtain continuing education units (CEUs)? Through this special series, ASPE can help you accumulate the CEUs required for maintaining your Certified in Plumbing Design (CPD) designation or numerous regulatory agency CE programs.

The process is simple: Each month, just go to **ASPE.org/ReadLearnEarn**, where you will find a PDF containing an article followed by a 12-question multiple-choice quiz and an application form. Read the article, answer the questions based on the article, and submit the form to the ASPE office. If you earn a grade of 90 percent or higher on the test, you will be notified that you have logged 0.1 CEU, which can be applied toward CPD renewal or numerous regulatory agency CE programs.

Tests are valid for one year, so you can earn up to 1.2 CEUs by successfully passing each test. (You can only receive one credit per test.) The cost is free for ASPE members and $35 per test for nonmembers.

Forms may be e-mailed to aspeeducation@aspe.org or faxed to 847-296-2963.

Young Engineers
Want to succeed in your career?
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Membership in the American Society of Plumbing Engineers provides the networking and professional development opportunities you need to advance in your career. Just listen to what these young professionals say:

"I joined the industry right out of college, which is when I also began my ASPE membership. My company immediately sent me to the ASPE Central Florida Chapter technical seminar, which was a great way to dive right into the industry. In college you learn about the theory and physics behind system design, but the ASPE technical class provided a great "how-to" to kick start my career.
With your membership and participation in ASPE events and meetings, you develop a large network of peers both locally and across the country. This helps unlock access to massive amounts of experience and knowledge to help you grow in your career.

Eric Knauth, PE, LEED AP
Plumbing Department Manager
exp U.S. Services Inc.

"ASPE has helped me as a young professional by helping me put my career in focus. When I started out as a member, I was just a plumbing designer at my company, but since that time I have obtained my Engineer in Training designation, have become an ASPE chapter board member holding two different positions, and now am studying for the professional license exam. My friends at ASPE have helped me see how becoming a licensed engineer would help me enhance my opportunities in my profession. I never would have even dreamed of gaining any special registrations or certifications if I hadn't been persuaded by the good friends I have made through ASPE.

Melissa Bowers, EIT
Mechanical Designer
Walsh Engineers

"From the technical articles published in Plumbing Engineer (and previously in Plumbing Systems & Design), to the monthly webinars, to the Plumbing Engineering Design Handbooks and the education sessions offered at the Convention & Exposition, ASPE has been an excellent resource for knowledge about plumbing system design. In addition to the technical knowledge, becoming a member of an international organization has allowed me to network with a number of experts, fellow designers, and engineers from around the world.

Kevin Der, P.Eng, LEED AP BD+C
Design Engineer
Smith + Andersen Falcon Engineering Ltd.

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Designer's Guide

Timothy Allinson, P.E., Murray Co., Long Beach, Calif.

LEED water calcs: Recent developments

Have you ever noticed that just about the time you are starting to feel expert in something, the rules are changed, you discover something new or a law is created that turns everything sideways? This seems to be happening with increasing frequency, especially with ever-growing environmental consciousness and litigation.

> To quote Bloat, the blowfish in Finding Nemo who utters the final line, "Now what?" Well, clearly every problem has a solution: It's just a matter of determining the most practical one.

Take LEED water calculations as an example. I have a project registered under LEED v2.2. Achieving maximum water conservation points in this relatively old version of LEED is not hard because the baseline assumes 1.6 gpf toilets, 1.0 gpf urinals and 2.5 gpm flow fixtures such as lavatories, showers and sinks. The use of "standard" UHE (ultra high efficiency) fixtures was usually enough to max out the water credits and possibly get an innovative design credit to boot. Such was the case on the project referenced at the top of this paragraph. Then the third-party LEED credit auditor got involved, and everything went sideways.

When the LEED calcs on this project were first done, floor plans were under development and little attention had been given during the calculation process to the fixture matrix on the project. When the LEED credit auditor reviewed the plans and the water calcs the comment was, "Where are all the urinals you have included in the calculation?" At first confused, I realized that the auditor was correct; the project had hardly any urinals. There were only two medium-size public toilet rooms with a total of six urinals. All of the other toilet rooms – 209 to be exact – were single occupancy unisex toilets with only a water closet and lavatory. I was stunned. I never realized that we had so few urinals. So, the assumption in the calculation that the male FTE (full time equivalent) staff would each use a pint-flush urinal twice a day was way off base and the LEED calc didn't work.

To quote Bloat, the blowfish in Finding Nemo who utters the final line, "Now what?" Well, clearly every problem has a solution: It's just a matter of determining the most practical one.

First I proposed to the LEED consultant that it stood to reason that male FTE staff members might each use a urinal once a day rather than twice, either on their way into the building in the lobby toilet, in the cafeteria toilet at meal time or in the lobby toilet on their way home. The LEED consultant said there was no precedent for such an assumption, so it was shot down.

Now I was in a bind. I tried running the calc assuming that all the FTE males used just the water closets and no urinals; that caused the water savings to drop below 40%, the magic number we had to maintain. I called the flush valve manufacturer (American Standard) to see whether they had a 1.28/1.1 gpf hard-wired flush valve and was told they did not. A call to the factory, however, revealed that they did, in fact, have a newly released product which was just that. This could be my salvation.

I reran the water calcs with the dual flush WCs, still assuming that the transient population would use the urinals in the lobby and cafeteria toilet rooms. The combined effect pushed us back up to 43.4%! Interestingly, the combined effect of 1.28 dual flush toilets for both men and women is nearly as effective as 1.28 regular WCs and pint flush urinals for the men.

If you do the math, four uses of the 1.28 WC plus two pint flush urinals totals 5.37 gallons for each male/female pair. Two uses of the 1.28 WC plus four 1.1 gallon flushes total 6.96 gallons per couple. The baseline calculation produces 8.4 gallons for the bathroom behavior of this same couple. So you can see that the savings are 36% and 17% respectively. Combine the 17% savings with the savings from the flow fixtures and you are in business to the tune of 40% +.

> When it comes to showers and sinks, again I believe that there are practical minimums. No matter how much you reduce the water flow at a kitchen sink, the pasta pot still requires six quarts of water to get the job done right.

Things get a little more complicated when you are dealing with a LEED 2009 (v3.0) project. Since the baseline flow value for lavatories was reduced to 0.5 gpm for 30 seconds, the benefit of low flow lavatories is greatly reduced. However, with the development of modern sensor lavatory controls, there is room for savings even against the 0.5 gpm baseline.

The latest lavatory faucets (American Standard again, as an example) have flow rates as low as 0.35 gpm, and flow duration can be adjusted as low as 7.5 seconds per cycle. Using these numbers, lavatory usage reduces

Continued on page 24

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Continued from page 22

from the 0.25 gallon baseline to 0.044 gallons per person. This is a significant savings. And while low flow water closets are considered by many to be a slippery slope, creating dry drains and carry distance issues, for public lavatories 0.044 gallons per use is a fairly practical minimum, since most people just give their hands a quick rinse before dashing out of the room. Even for the more fastidious user, who spends time soaping up like a surgeon preparing for an operation, the water will stop running as the lathering takes place, saving water in the process.

The down side of taking water savings at lavatories to its limit is the issue of hot water delivery. With so little water used per cycle, the hot water rarely, if ever, reaches the user. This gets into another subject that is beyond the scope of this month's article, but it is one of the challenges associated with water conservation facing today's engineer.

When it comes to showers and sinks, again I believe that there are practical minimums. No matter how much you reduce the water flow at a kitchen sink, the pasta pot still requires six quarts of water to get the job done right. This is a simple law of Italian nature that will never change. Or will it? It wouldn't surprise me if I were to find in the grocery store tomorrow a box of "sustainable" spaghetti marketing itself as requiring less water to cook. (Of course, it's the same pasta with different instructions that cause it to cook as a sticky glob.)

With showers, a woman with long hair still requires a certain amount of water to rinse out the shampoo. Of course, the sustainable female should shave her head to reduce the water demand made by her hair, but that might have ramifications on the sustainability of our species. Kidding aside, there is a practical minimum to how much water a shower should flow, and I personally think it shouldn't fall below 1.75 gpm.

I think that the next step for LEED in water conservation might be to start including dishwashers and washing machines in the calculation process. This will get manufacturers to start focusing more intensely on the water conservation of these appliances. I know there have been certain advances in this area already, but the appliance focus still seems to be more on energy consumption than water conservation. Surely that will change soon. ■

Timothy Allinson *is vice president engineering with Murray Co. mechanical contractors in Long Beach, Calif. He is licensed in both mechanical and fire protection engineering in various states and is LEED accredited. He can be reached at laguna_tim@yahoo.com.*

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Code Classroom

Ron George, CPD
President, Plumb-Tech Design & Consulting Services, LLC

2012 International and Uniform Plumbing Code Comparison

The International Plumbing Code (IPC) is a model code that is developed by the International Code Council (ICC) for adoption by State and local governments as their local plumbing code. The International Code Council has developed a family of codes that are correlated with each other to work together without conflicts. This family of codes is usually adopted by state and local governments through local ordinances or laws to make these codes enforceable in their jurisdiction with the force of law. The full family of International Codes include: The Building Code, Residential Code, Fire Code, Energy Conservation Code, Plumbing Code, Mechanical Code, Fuel Gas Code, Private Sewage Disposal Code, Existing Building Code, Property Maintenance Code, Wildland-Urban Interface Code, Zoning Code, Performance Code for Buildings and Facilities, Green Construction Code and the Swimming Pool and Spa Code. The Uniform Plumbing Code is developed by the International Association of Plumbing and Mechanical Officials (IAPMO).

2012 International Plumbing Code

The IPC regulates the design and installation of plumbing systems including the plumbing fixtures in all types of buildings except for detached one- and two-family dwellings and townhouses that are not more than three stories above grade in height. The regulations for plumbing systems in one- and two-family dwellings and townhouses are covered by Chapters 25 through 33 of the International Residential Code (IRC). The IPC addresses general plumbing regulations, fixture requirements, water heater installations and systems for water distribution, sanitary drainage, special wastes, venting, storm drainage and medical gases. The IPC does not address fuel gas piping systems like the Uniform Plumbing Code (UPC) does in UPC chapter 12 because fuel gas systems are covered by the International Fuel Gas Code (IFGC). The IPC also does not regulate swimming pool piping systems, process piping systems, or utility-owned piping and systems. The purpose of the IPC is to the establish the minimum acceptable level of safety to protect life, health and property from the potential dangers associated with supplying potable water to plumbing fixtures and outlets and the conveyance of bacteria-laden waste water from plumbing fixtures.

The IPC is primarily a specification-oriented (prescriptive) plumbing code with some performance-oriented text. For example, section 405.1 Water supply protection. Contains a performance requirement which states "The supply lines and fittings for every plumbing fixture shall be installed so as to prevent backflow", but Chapter 6, Water Supply and Distribution contains the prescriptive requirements for Backflow prevention that satisfy section 405.1. The IPC lists standards in the body of the code when they apply to a specific application. The Uniform Plumbing Code committee has historically voted to minimize specific references to where product standards should apply in the code body preferring to simply list the standards in Chapter 14 of the UPC. This creates confusion because often there are multiple standards for a product and without specific references in the body of the code; enforcement of the Uniform Plumbing Code can be inconsistent.

IPC and UPC both use the Common Code Format

The International Plumbing Code and the Uniform Plumbing code both follow a common code format that was established in the late 1980s and the model codes in the United States first used the common code format in 1993. Since 1993, the subsequent editions of the model codes have been published in a common code format for the first 11 chapters of each code. This enables users to more easily find the information they are looking for and understand the codes and their requirements. The common code format was intended to help code users at least get to familiar with common code sections so in the future it would be easier to have a single model plumbing code covering the entire United States. Since then both model code agencies have branched out to market their codes for adoption in various international locations. We still do not have a single model plumbing code in the United States,, but with each code cycle the codes seem to be getting closer to each other to the point where a single model plumbing code may be possible someday.

Arrangement of the Chapters in the 2012 International Plumbing Code

The format of the IPC allows each chapter to be devoted to a particular subject following the common code format. When a code provision is new from the previous edition of the code there is a vertical line in the margin of the code to identify the code provision as new or revised text. When a code section has been removed an asterisk is placed in the margin to alert the code user to code language that has been removed during the previous code cycle. Chapter 3 contains general subject matters that apply to all sections or general installation requirements that do not fit into a specific code section. The International Plumbing Code is updated every three years. The current code is the 2012 Edition; however, the local jurisdictions usually take several years to review the model code, propose local amendments — if any — and then they can adopt the code locally for enforcement. The 2015 IPC code changes have been submitted and hearings were held in May of 2012. The Final Action Hearings will be held in Portland, Oregon in October of 2012, and the

Continued on page 28

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Circle 14 on Reader Reply Form on page 65

continued from page 26

2015 code should be ready for publication in 2014. The following is a chapter-by-chapter summary of the scope and intent of the provisions in each chapter of the 2012 International Plumbing Code:

2012 IPC Chapter 1 - Scope and Administration. This chapter contains provisions for the application, enforcement and administration of subsequent requirements of the code. In addition to establishing the scope of the code, Chapter 1 identifies which buildings and structures come under its purview. Chapter 1 is largely concerned with maintaining "due process of law" in enforcing the requirements contained in the body of this code. Chapter 1 has the ability to be modified to suit the local jurisdictions requirements for enforcing the code.

2012 IPC Chapter 2 - Definitions. Chapter 2 is the repository of the definitions of terms used in the body of the code. Codes are technical documents and every word, term and punctuation mark can impact the meaning of the code text and the intended results. The code often uses terms that have a unique meaning in the code and the code meaning can differ substantially from the ordinarily understood meaning of the term as used outside of the code.

The terms defined in Chapter 2 are deemed to be of prime importance in establishing the meaning and intent of the code text that uses the terms. The user of the code should be familiar with and consult this chapter because the definitions are essential to the correct interpretation of the code and because the user may not be aware that a term is defined.

Where a term's definition is important or necessary for understanding of a particular code provision, the term is shown in italics wherever it appears in the code. This is true only for those terms that have a meaning that is unique to the code.

Guidance regarding tense, gender and plurality of defined terms as well as guidance regarding terms not defined in this code is provided.

2012 IPC Chapter 3 - General Regulations. The content of Chapter 3 is often referred to as "miscellaneous," rather than general regulations. This is the only chapter in the code whose requirements do not interrelate. If a requirement cannot be located in another chapter, it should be located in this chapter. Chapter 3 contains safety requirements for the installation of plumbing and non-plumbing requirements for all types of fixtures. This chapter also has requirements for the identification of pipe, pipe fittings, traps, fixtures, materials and devices used in plumbing systems.

The safety requirements of this chapter provide protection for the building's structural members, as well as prevent undue stress and strain on pipes. The building's structural stability is protected by the regulations for cutting and notching of structural members. Additional protection for the building occupants includes requirements to maintain the plumbing in a safe and sanitary condition, as well as privacy for those occupants.

2012 IPC Chapter 4 - Fixtures, Faucets and Fixture Fittings. This chapter regulates the minimum number of plumbing fixtures that must be provided for every type of building. This chapter also regulates the quality of fixtures and faucets by requiring those items to comply with nationally recognized standards. Because fixtures must be properly installed so that they are usable by the occupants of the building, this chapter contains the requirements for the installation of fixtures. Because the requirements for the number of plumbing fixtures affects the design of a building, Chapter 29 of the International Building Code (IBC) includes, verbatim, many of the requirements listed in Chapter 4 of this code. This is because the Architects often use the Building code to determine the building layout, space requirements, egress requirements and minimum numbers of fixtures. This puts all of the building layout information in one code for the Architect. ■

The remainder of this column can be found online at www.plumbingengineer.com/code0612.php

Ron George *is president of Plumb-Tech Design and Consulting Services LLC. He has served as chairman of the International Residential Plumbing & Mechanical Code Committee. Visit www.Plumb-TechLLC.com, email Ron@Plumb-TechLLC.com or phone 734/755-1908.*

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Circle 15 on Reader Reply Form on page 65

FPE Corner

Samuel S. Dannaway, PE, FSFPE
President, S.S. Dannaway Associates Inc., Honolulu

Balancing act

A while back I was waxing eloquently about the page inflation of the red book (NFPA 13) over the years. It occurred to me that in addition to the many reasons for the inflation discussed in that article, the page inflation may be a symptom of balance issues on some committees.

Before I dig myself too deep of a hole, this is neither a criticism of NFPA nor the NFPA standards making process. I hold the NFPA standards making process in high regard and view it as a shining example of the free market of ideas at work. My concern is there may be players that are gaming the system to their advantage (just like one takes advantage of every legal loophole one can when doing our taxes). Let's start with a primer on the balance requirements for NFPA committees. The rules for make-up of NFPA technical committees are contained in the NFPA's Regulations Governing Committee Projects. NFPA currently classifies members into the following interest categories.

C – Consumer
E – Enforcer
I – Insurance
I/M – Installer/Maintainer
L – Labor
M – Manufacturer
R/T – Applied Research/Testing Laboratory
SE – Special Expert
U – User

NFPA attempts to maintain balance on each committee primarily by prohibiting the committee from having more than one-third representation of any single interest. Also, the fact that final committee votes on proposals and comments must receive a two-thirds majority to pass prevents imbalance.

In looking at the current make up of voting members technical committees for five installation standards my very unofficial survey revealed the following average percentage interest group participation:

C	0.0%
E	8.8%
I	20.0%
I/M	18.8%
L	3.8%
M	20.0%
R/T	3.8%
SE	17.5%
U	7.5%

Ok, that looks like a fairly balanced set-up. Here's what I see as the issue. The Installer/Maintainer interest classification tends to be filled by larger companies often of a regional scope. It is much less likely to see I/M's from companies like Frostbite Falls Fire Extinguisher Service and more likely to be a large regional firm which is more or less committed to a specific equipment from certain manufacturers. Manufacturers and Installer/Maintainers also tend to have financial support from their companies to attend the meetings and many actually have committee members whose primary job function is to participate in technical committee work. This is also true of the some of the major trade organizations who have committee members primarily in the M and I/M categories.

Follow me now. It is a cornerstone of the free market for one to act in one's own self interest. Now in addition to the interest of protecting life and property, it is reasonable to expect manufacturers, installers, and their labor component to support measures which support their products and which will increase the amount of stuff required. More sprinklers, more smoke detectors, more smoke dampers, more labor, more maintenance, more whatever. Also, it is reasonable to expect the occasional code proposal that "inadvertently" restricts the market to certain players. On this latter point the NFPA standards making process has done a very good job of catching this stuff.

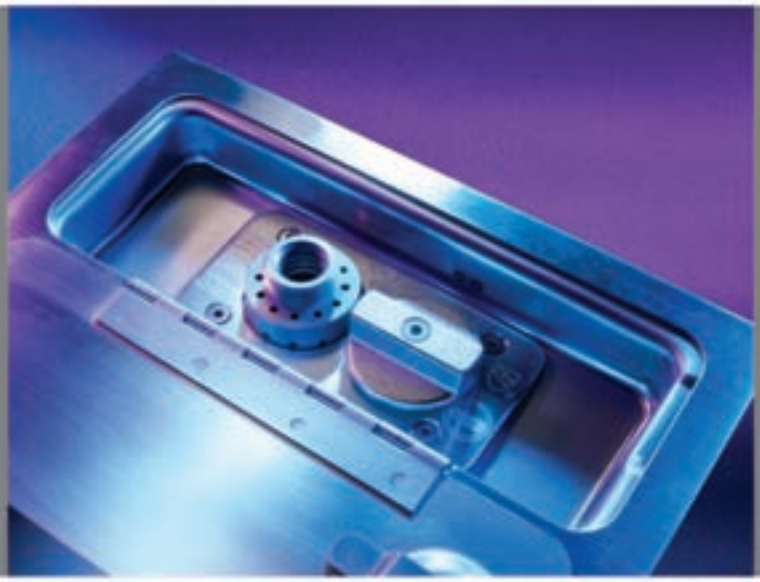
If you accept my speculation up to this point then you may agree that the manufacturers, installer/maintainers, and labor will tend to vote in concert on issues dealing with requiring more stuff. This is where the balance issue comes into play. In some cases, representatives from differing interest groups may vote as a block for proposals that might benefit all of them. From the informal data above those M, I/M, and L interest groups make up, on average, 42% of the committees. There is no violation of NFPA rules here, but a possible balance issue nonetheless, particularly if some committee members from the other interest groups fail to attend technical committee meetings or submit votes.

How can balance be improved? One way is to increase enforcer and user representation on the committees. Much to NFPA's credit they have long recognized the problem with getting participation from enforcers and now have a fantastic program supporting enforcer participation (see http://bit.ly/J4Jvfq). NFPA will pay for up to as much as 80% of the cost of participation by enforcers. I have personally seen how this benefits the committee. Also, in defense of NFPA, there have been instances in the past in which a particular membership classification gained undue influence on the committee and the NFPA Standards Council intervened to rebalance the committee by disbanding and reconstituting the committee.

Increasing participation from the User and Consumer interests would also vastly improve committee balance. Users will not tend to support proposals put forth that would increase the initial or recurring cost of installed systems, i.e., proposals that require more stuff.

Here are my two cents for improving committee bal-

Continued on page 32



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Circle 16 on Reader Reply Form on page 65

FPE Corner

Continued from page 30

ance: The Special Experts interest category should be redefined to contain true subject matter experts in the technical committee scope as well as consultants that have significant lobbying activity in support of other interest groups (these two parties are not necessarily mutually exclusive). In addition, I recommend a new category be created for the Architectural-Engineering (A-E) consultant. This category will be for those architects and engineers involved in the design and construction industry but that do not provide lobbying services for other interest categories.

Traditionally, the special expert category is primarily the place where NFPA stuffs engineers and architects in the design and consulting industry; however, I see consultants falling into two distinct groups. A-E consultants work exclusively in their respective architectural or engineering disciplines and do not provide lobbying services for other categories. The other group of consultants does a substantial amount of lobbying often as representatives for other categories, manufacturers in particular. By this they often become defacto M or IM members, further straining balance. Now NFPA rules require committee members that represent other interests to declare those interests and to recuse themselves from voting. That is a significant control; however, the fact that the committee member involved can still participate in the committee discussions provides significant advantages.

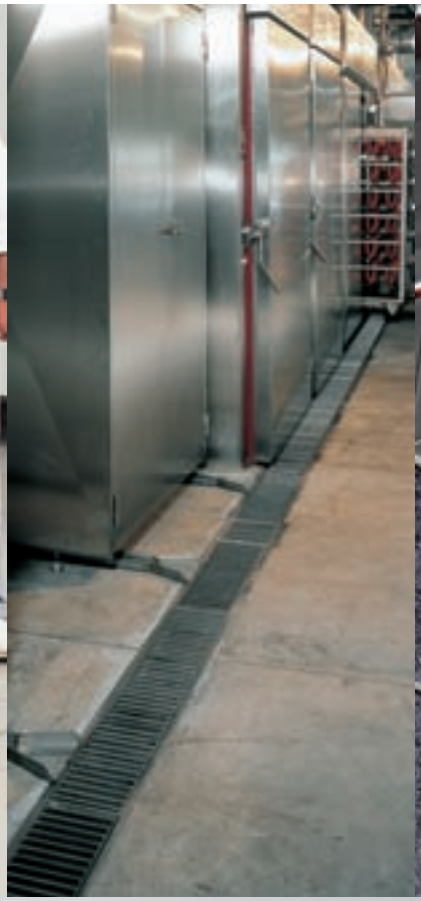
By creating a new interest category of A-E consultant the impact of cooperation can be lessened. Now I want to make it clear that I am not making any specific accusations and the members of the committees on which I participate are skilled and knowledgeable professionals that generally do the right thing. But human nature is what it is.

So this is where your help is needed: Do not sit around and complain about all the ridiculous additional stuff the latest standard now requires. Get yourself on a committee and help right the ship.

SFPE Notes

Draft Guidelines for Designing Fire Safety in Very Tall Buildings Available for Public Review - The Society of Fire Protection Engineers, in collaboration with the International Code Council, is developing Guidelines for Designing Fire Safety in Very Tall Buildings. The Guidelines for Designing Fire Safety in Very Tall Buildings provides information on the topics that affect the performance of very tall buildings and their occupants in fire. This guide addresses these topics using performance-based fire protection engineering concepts. It is not intended to be a recommended practice or a document that is suitable for adoption as a code. Comments are due June 8, 2012. To download the draft guide

Continued on page 64



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Circle 18 on Reader Reply Form on page 65

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Sustainable Design

By Winston Huff, CPD, LEED AP BD+C

Water efficiency changes for LEED 2012

The USGBC LEED rating system is a guideline for building teams wanting to design, build and operate sustainable buildings that reduce energy and water consumption when compared to "average" buildings through the use of sustainable site, materials and resources practices. The LEED rating system offers a checklist of sustainable elements, called credits, which can be used in a building. The more credits that a building team earns, the higher the sustainable rating is for the building.

Later this year after the USGBC members vote, the rating system is scheduled to be updated for 2012. I am a member of the Technical Advisory Group (TAG) responsible for the revision. We have worked for several years to develop the new water-efficiency prerequisites and credits that will be included in LEED 2012. During our first meetings, we discussed what future sustainable buildings would look like to determine what the rating system should require.

We debated initiatives such as the 2030 Challenge, which aims for all new buildings to be net zero energy or carbon neutral by the year 2030. At what point in the future should LEED Platinum-rated buildings be required to be net zero energy? Is net zero energy the ultimate goal of sustainable buildings? What about beyond net zero? Current thinking is that a truly sustainable building should go beyond net zero energy and be regenerative or be able to produce enough energy on site to supply surrounding buildings.

Energy use is an important consideration, but what about water? In the future, buildings could be net zero water and even regenerative water. Future buildings could be self-sufficient, with few or no connections to the municipal water system. Similar to energy systems, a water-regenerative system could collect, filter and monitor water inside the building as well as supply other buildings around it to help them be net zero water.

All of these topics are interesting concepts to discuss, and it is a great exercise to look at the possibilities for future buildings. For now, LEED 2012 must consider real-world technologies and strategies that are currently in the marketplace, while keeping the future goals in mind. It also must include some challenges to help the industry expand and incorporate new strategies into building designs. The end result is that the 2012 revision can make significant reductions in water consumption in LEED-certified buildings. More water systems are included in the guidelines, and more credits are available for water efficiency.

Draft copies of the proposed guidelines are available on the USGBC website (usgbc.org). The new version is scheduled to be introduced this November at the Greenbuild conference in San Francisco. New copies and educational materials will be available at that time as well.

The intent of this article is to provide an overview of LEED 2012 from a water perspective. For more detail, refer to the draft guidelines. Changes in the credits will be made to all of the rating systems, including Building Design and Construction, Existing Buildings, Operations and Maintenance and Healthcare. The goal was to simplify the WE (Water Efficiency) credits and to address the different water users in a building.

Outdoor water use reduction

The largest irrigated crop in the United States is turf grass. Large amounts of drinking-quality water are used to irrigate lawns, golf courses, landscapes and more (see sidebar). To address this concern, the outdoor water use reduction prerequisite and credits are simpler to follow and now use the Landscape Water Requirement (LWR) as calculated by the EPA WaterSense Water Budget tool.

The credit encourages facilities to design and install landscaping that does not require irrigation. If a building does require irrigation, the guidelines encourage designs that reduce the amount of water used in the irrigation system. Better irrigation controls and collecting alternate water (using rainwater harvesting, for example) can reduce the amount of water the facility uses for irrigation.

The exclusions for outdoor water include non-vegetated surfaces, athletic fields, playgrounds and food gardens.

Requirement reduction: A fundamental question has to be considered: If alternative water is used in the irrigation system and municipal water use is reduced, does a site still need to use efficient systems? For example, can buildings that have access to plenty of rainwater and use little municipal water still be considered sustainable if the irrigation system uses large amounts of the harvested water? Should the USGBC certify a building that has inefficient irrigation?

A sustainable building should use less water and should use the water it does have efficiently. This is why a facility should obtain one point by reducing the landscape water first through water-reduction measures. For example, plant species selection and irrigation system efficiency should be used on all sustainable buildings whether they have alternate water or not. Additional water-efficiency measures beyond the required reduction measures can be from alternate water sources.

Alternate water: Alternate water systems are encouraged in the credits and can include rainwater harvesting, air-conditioning condensate and other sources of onsite water. The design and construction teams, owner and property management should look at alternative water systems as a water source early on in a project. Then the team can decide if the water is best used for irrigation, process water, graywater, mechanical or some other water supply for the facility.

Metering: Water metering is encouraged in many of the Water Efficiency credits, including the outside water credits. Studies have shown that the installation of water meters reduces water usage. The meter itself does not reduce water usage; it measures the way water is used. Water meters show the operator when and where leaks are occurring and track water use patterns. The end result is that the facility operator has a tool to run the water system efficiently.

Continued on page 36

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Circle 19 on Reader Reply Form on page 65

Continued from page 34

Indoor water use reduction

This credit covers the plumbing fixtures, which are an important part of water efficiency. The prerequisite in LEED 2012 is the same: Fixtures must be 20 percent more efficient than the baseline. Obviously, using more efficient fixtures can increase the number of credits for a facility.

Similar to the outdoor water use section, a question could arise. What if a building used alternate water for the plumbing flush fixtures and little or no municipal water? Can a sustainable building use inefficient fixtures even if the building uses alternative water? For example, should a building that uses harvested rainwater to flush fixtures be allowed to use inefficient water closets and urinals? Can this building be considered sustainable?

The intent is that a sustainable building should have a core concept of efficiency and consider all water use both on and off site. Even though it obtained credits by using alternate water sources, a building would not be considered sustainable if that water was not used efficiently.

A criticism of past versions of LEED is that they did not include other systems in a building that use water. For 2012, process water and appliances are now included in all of the rating systems. The process and appliance section includes the other interior systems that use water such as clothes washers and dishwashers. These systems can be large water consumers in residential buildings and food service facilities.

Building-level water metering

The water industry lacks water use data to serve as a baseline in different types of buildings such as healthcare and food service facilities. LEED 2012 includes a building-level water meter prerequisite intended to help building owners monitor water use and provide data to the USGBC so they can develop a better database.

The intent of the credit is to provide accurate water consumption patterns to support operations and identify opportunities for additional water-saving practices. Similar to the outdoor credit, water meters and a monitoring system will help operations identify problems and develop solutions for the facility's water consumption. Metering includes irrigation, plumbing fixtures, domestic hot water, reclaimed water and mechanical uses.

Cooling towers

Cooling towers use large amounts of water in buildings. LEED 2012 requires basic equipment for the prerequisite, including makeup and blowdown meters, conductivity controllers and overflow alarms. Drift is a concern where water is sprayed into a tower and cross winds can blow the water out of the tower. To address this issue, the towers are now required to have drift eliminators.

Again, the prerequisite requires an efficient baseline for the cooling tower system. If a building uses alternate water sources, it could not be a sustainable building if it did not use that water efficiently.

The prerequisite covers the hardware items of the cooling tower. The credit involves the operations of the cooling tower system. Installing certain features in a cooling tower can reduce water usage but does not guarantee that the total system will use less water. Proper operation of the system and using the tools that are available to the operations staff are necessary to reduce total water usage.

The water in a cooling tower system must be treated and maintained. The source water can be hard or soft depending on the quality of the available water, and the cooling tower is open to the atmosphere, requiring methods to prevent biological contaminants from entering the water loop. As the water evaporates, the treatment residue will concentrate in the remaining water, requiring the water to be "blown down" and replaced with fresh water. The LEED credit is intended to encourage operators to reduce the frequency of blow-

The modern way to water a tree

The water cycle we have created is comical when you consider how we water a tree in a parking lot. Normally, trees depend on the rain for water but not in our modern, complicated watering system. Let's stop and take a look at the steps involved simply to water a tree.

Illustration from MeGreenYouGreen.com

Rain falls onto a parking lot. It would be simple to let the rain water the tree, but no, we stop it from reaching the tree by collecting it in a catch basin and diverting it to an elaborate underground piping system, thus preventing a majority of the rainwater from absorbing into the ground.

In a combined sewer system, the rainwater is mixed with waste or sewer water that is a cocktail of hazardous materials, including biological, chemical, solid and pharmaceutical waste. It takes a lot of power to move, clean, treat and monitor this water-based waste stream. One source of power comes from a complicated system of splitting atoms — which took lots of smart people like Albert Einstein to figure out — or we blow up mountains to get coal and burn it in boilers.

This treated water is then sent to a natural source such as a lake or a stream, but this is not the end of the process. To water the tree, we take water from the natural source and then treat, monitor and move it to an irrigation system that will water it using another energy source.

Seems silly, right?

down; as a result, the overall system will use less water. Alternate water can be used as cooling tower makeup to help obtain this credit. Building teams are looking at alternate ways to capture rainwater or air-conditioning condensate to use in facility cooling towers.

Wastewater management

The intent of this reworked credit is to increase the efficiency of wastewater reuse by encouraging water reuse, reduction or recovery. The way the credit is restructured should encourage design teams to develop alternate water systems. Technologies recently introduced have increased the availability of these systems to project teams. New standards are now available for these systems, including NSF 350: Onsite Residential and Commercial Reuse Treatment Systems.

Conclusion

The new and restructured Water Efficiency credits in LEED 2012 introduce new areas such as process water and cooling towers that can be developed in future rating systems to further reduce water usage in a facility. They set the groundwork to promote the importance of water efficiency in sustainable buildings. Just because a building with inefficient systems and fixtures uses alternate water does not mean it should be considered a sustainable building. Efficiency should be an important first goal in all sustainable buildings.

Alternate water systems should continue to be an important part of sustainable buildings. Future buildings should not use drinking-quality water for their non-drinking water systems. Reducing the amount of municipal water used in a building also will help communities use less energy and reduce the strain on old water infrastructures.

Collecting rainwater on site can reduce rainwater flows downstream while also reducing the amount of water used from municipal systems. LEED 2012 is an important step in incorporating these issues in today's buildings. ■

***Winston Huff**, CPD, LEED AP BD+C, is a project manager, plumbing fire protection designer and sustainable coordinator with Smith Seckman Reed Consulting Engineers in Nashville, Tenn. He serves as an ASPE representative on the ICC Green Construction, Energy and Water Code Development Committee and is on the U.S. Green Building Council's Water Efficiency Technical Advisory Group. He was the founding editor of Life Support and Biosphere Science and has served as its editor-in-chief. He also is editor of megreenyougreen.com, a LEED credit databank.*

Solar Solutions

Bristol Stickney, chief technical director, SolarLogic LLC, Santa Fe, N.M.

Bristol's Six Principles for Good Solar Hydronic Design

#47: Piping the solar collectors with flexible tubing

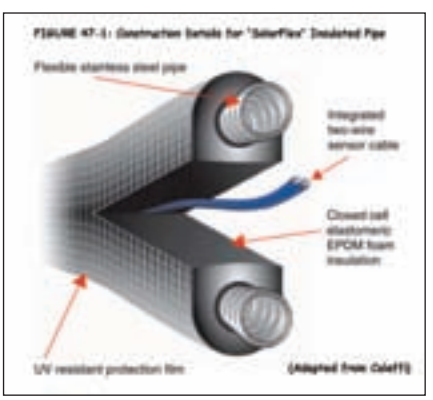
The best innovations in solar heating systems in recent years have evolved by combining pre-engineered and pre-assembled components. When multiple components are matched and assembled during manufacture, it eliminates the labor of assembly and the high potential for error in the field. In solar home heating systems, the use of modular heat distribution manifolds and pre-engineered pump stations, for example, has gained in popularity because of the speed of installation and the increased reliability of the results.

Another area where modular equipment is now available is in the solar connective piping itself. The insulated (metal) supply and return piping that connects the solar collectors to the boiler room must be resistant to very high temperatures. The outdoor runs must be resistant to weather and sunlight. The path of this piping often runs through tight spaces with awkward angles and bends. Traditionally, this piping has typically been done with copper tubing in a meticulous three-step process involving (1) soldering copper pipe together with couplings and elbows, (2) installing the insulation and (3) finishing with a weatherproof cover. The use of pre-insulated flexible piping can eliminate most of that work in the field, saving many hours of installation.

Flexible stainless steel insulated pipe

Figure 47-1 shows the construction detail of a stainless steel solar supply and return pipe assembly using an example available from Caleffi Solar. It consists of two corrugated stainless steel pipes inside an EPDM closed-cell foam insulation jacket with an integrated sensor wire built in. It is most commonly packaged in 50-foot coils. The insulation is coated with a copolymer foil that protects against damage from solar UV radiation. It comes in three common sizes, ½", ¾" and 1" nominal pipe sizes. This modular tubing is lightweight and easy to bend, with a springy feel to it. The two corrugated pipes are made of 316L stainless steel with a bending radius of 5 inches, a working pressure rating of 150 psi and a maximum fluid temperature of 350 F.

The stainless tube can be cut using a tubing cutter, the same as that used with copper tubing. It requires special adapters at each end to allow connection to standard U.S. pipe thread. Adapters are available from suppliers, and it is always a good idea to order a few extra to have on hand in the field. The adapters that I have used so far are surprisingly fast and easy to install and "act like" a threaded brass union with a flat gasket when making the final pipe connection. Short pieces can be cut and fitted with adapters to make other connections to the glycol system or to other boiler-fluid piping.



The pressure drop

Because the tubing is corrugated, the inside surface has a rough finish, which results in a higher pump resistance than smooth copper tubing. This must be taken into account when designing the solar glycol loop and the glycol pump to go with it. At common glycol flow rates for solar collectors, the difference is in the range of 20 – 30 percent higher pump resistance than in comparable smooth pipe. Figure 47-2 shows how the corrugated stainless compares to copper tube, using the Aeroline products, for example. Aeroline makes pre-insulated smooth copper tubing, assembled in the same way as their stainless steel product, so a direct comparison can be easily made.

For example, on Figure 47-2, a flow rate of 5 gpm through a pair of ¾" tubes 50 feet long requires about 10 feet of head to pump through copper (seen as a red line and labeled "CU"). The same flow rate through "Aerorapid" corrugated ¾" pipe requires over 12 feet of heat (seen as a blue line). If 1" corrugated pipe is used with the same flow rate, less than 4 feet of head is required.

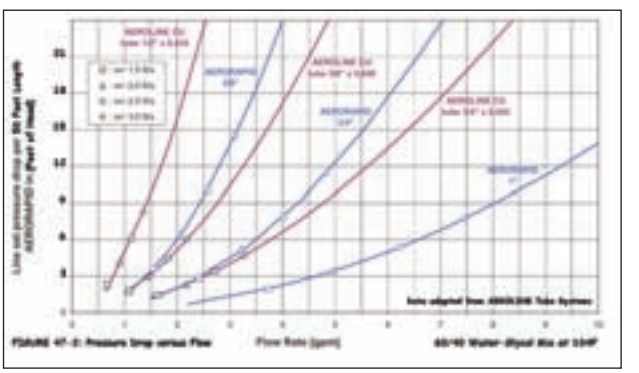


Figure 47-3 shows the pump head available from a common Grundfos 3-Speed circulator. Notice that, for this example, at 5 gpm the 1" corrugated could be pumped at low speed and the ¾" copper could be pumped at medium speed, while the ¾" corrugated may require high speed.

Other considerations

Remember that the discussion above has been limited to the pump resistance due only to the supply/return piping. Other plumbing components, such as collectors, heat exchanger, shut off valves, elbows and other fittings that provide additional resistance must also be included to obtain the total pressure drop for the entire glycol loop. The circulator pump must be sized to overcome the total resis-

Continued on page 40

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Continued from page 38

tance to flow.

The glycol mixture and its average temperature have a significant effect on the pump resistance. Figure 47-2 covers a typical mixture and temperature (as labeled), but colder temperatures or thicker mixtures (for example) will have different results.

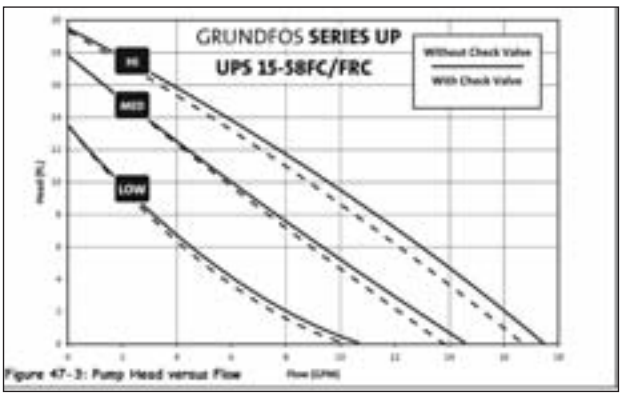


Figure 47-2 presents the flow through a pair of pipes, one supply and one return. This means that a 50-foot long sample actually contains 100 linear feet of pipe. Sometimes you have to look at the labels or fine print carefully to avoid comparing a single pipe to a pair of pipes when looking at the flow resistance of different products or brands.

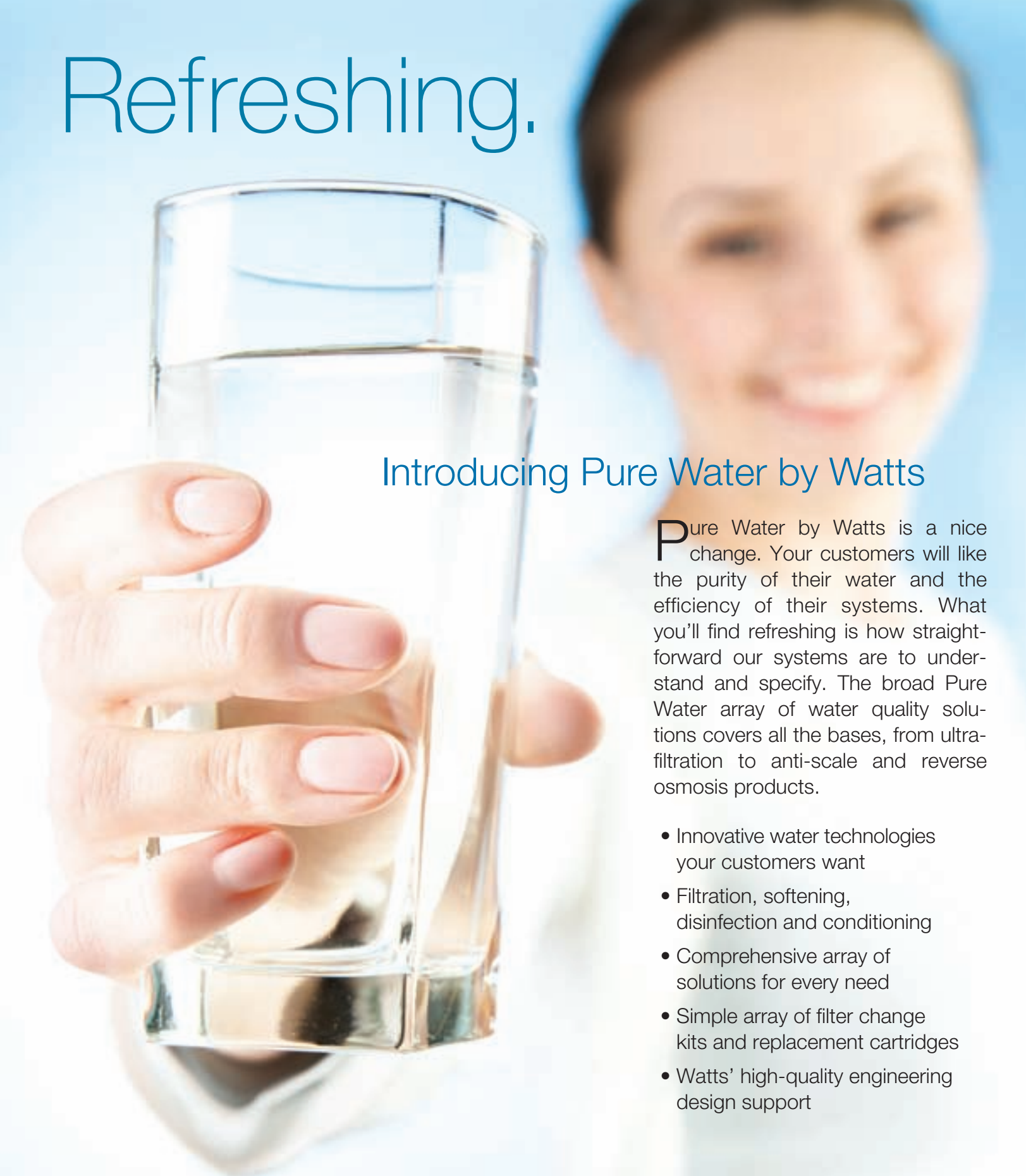
Final notes

These articles are targeted toward residential and small commercial buildings smaller than 10,000 square feet. The focus is on pressurized glycol/hydronic systems, since these systems can be applied in a wide variety of building geometries and orientations with few limitations. Brand names, organizations, suppliers and manufacturers are mentioned only to provide examples for illustration and discussion and do not constitute recommendation or endorsement. ■

Bristol Stickney *has been designing, manufacturing, repairing and installing solar hydronic heating systems for more than 30 years. He holds a Bachelor of Science in Mechanical Engineering and is a licensed mechanical contractor in New Mexico. He is the chief technical officer for SolarLogic LLC in Santa Fe, N.M., where he is involved in development of solar heating control systems and design tools for solar heating professionals. Visit www.solarlogicllc.com for more information.*

In this series of articles, I have been making the case that the key ingredients for solar/hydronic design and installation can be divided into six categories, roughly in order of their importance: 1. Reliability; 2. Effectiveness; 3. Compatibility; 4. Elegance; 5. Serviceability and 6. Efficiency. *The success of any solar hydronic home heating installation depends on the often-conflicting balance between any of these six principles. Finding the balance between them defines the art of solar heating design.*

Refreshing.



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THE TOP ENGINEERING PROJECTS OF 2012

In today's competitive construction market, how can engineering firms maintain an edge over their rivals for the limited design projects that become available? With so many options to choose from, building owners can be selective and demand the most innovative solutions to their construction challenges—often with strict budgets and tight schedules. *Plumbing Engineer* invited firms to share their success stories in an effort to determine the answer to this question, and from the submissions we've selected the best examples of engineering firms that are pioneering ground-breaking design concepts.

The common theme among these firms is a commitment to developing the most efficient and sustainable systems for their clients' unique needs—from a water-cooled dental vacuum system for Georgia Health Sciences University's College of Dental Medicine to rainwater harvesting and graywater systems to offset toilet, urinal, and irrigation demands for NOAA's Pacific Regional Center, as well as the transformation of a casino into the Kansas Star Equine Center and a new hemodialysis water-treatment and distribution system for the University of Minnesota Amplatz Children's Hospital. Helping clients earn LEED certification also plays a major role in these firms' strategies, as evidenced by the Eastside Fire & Rescue Station 72 in Issaquah, Washington, which earned LEED Platinum certification through the use of energy optimization and water reclamation.

We hope you enjoy reading about these innovative strategies from the country's top engineering firms.

Mid-Continent Public Library

Kansas City, Mo.
Larson Binkley

Mid-Continent Public Library's design consultant team recently completed the design for the new Woodneath Branch Library. Located in the Shoal Creek area of Kansas City, the new 35,000-square-foot building will be connected to an existing two-story antebellum home that was built in the 1850s. Construction is scheduled to be completed in December 2012.

Building features include a curved concourse near the front entries, multiple angled exterior walls, windows on the east and west elevations and a clearstory for natural light in the main library. The new library is divided into

three sections. The southernmost section includes meeting rooms, a computer lab, the young adult collection and a coffee shop. The central section will house the main collection. The northernmost section includes administrative offices, the children's collection and a story hour room.

As part of the approach to earn LEED certification, the design team selected water efficient plumbing fixtures. The public and staff restrooms utilize dual flush water closets at 1.6/1.1 gpf, urinals at 0.12 gpf and metered, sensor operated lavatory faucets that use no more than 0.08 gallons per cycle. Break room sinks utilize low flow 1.5 gpm faucets.

These low flush and low flow plumbing fixtures are

Continued on page 44

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Continued from page 42

designed to achieve water savings of 45% better than baseline, earning 4 points for LEED WE Credit 3, Water Use Reduction and 1 point in the Innovation in Design credit category for exemplary performance in WE Credit 3. A water sub-meter was specified to allow the building owner to track water usage. This also contributes to earning points for LEED Credit 5, Measurement and Verification.

The project presented an unusual design challenge for the roof drainage system, due to the numerous roof types with varying heights. The system consists of sloped metal roofing with downspouts that convey storm water to combination primary/overflow drains located on the flat roof areas, where it extends to a below-grade storm water system outside the building. The combination primary/overflow drains resulted in labor savings, since separate overflow drains were not required.

Eastside Fire & Rescue Station 72

Issaquah, Wash.
Ecotope

Fire Station 72 in Issaquah, Wash., is an 11,400-square-foot, full-time facility operated by Eastside Fire and

Photo: Shawn Oram, Ecotope

Rescue. The station houses three rotating shifts of six firefighters at a time. It includes offices, living quarters, three truck bays and support spaces. This project was designed to achieve the aggressive energy efficiency targets of the Architecture 2030 Challenge. The building itself was designed to achieve a 70% reduction in energy use over the regional average for fire stations before solar electric panels were installed. The project received LEED v3.0 Platinum certification.

The project includes an 8,500-gallon, above-grade rainwater cistern for toilet flushing, laundry, irrigation and truck washing and is on track to reduce potable water use by more than 50% over a standard fire station. The project also includes a grid-tied 30 kW solar electric array. Ecotope provided energy efficiency consulting, full mechanical and plumbing design and LEED and sustainability consulting.

Fire trucks are cleaned regularly to reduce transport of potential pollutants and pathogens and to keep the vehicles clean and shiny. Truck washing uses a great deal of potable water in a typical fire station. To reduce this demand, the station harvests rainwater from the roof into a large above-ground cistern. This water is used for all non-potable needs; to wash trucks, flush toilets, to irrigate and for clothes washing.

Ecotope used 10 years of daily rainfall data to develop a cistern sizing calculator. This type of analysis is much more accurate for sizing than using monthly averages or even daily averages. Using actual historical data allows for a better predictor of both large storm events and unusually long dry periods that occur from time to time. Use of rainwater at this station is predicted to save more than 58,000 gallons of potable water each year.

Meier and Frank Warehouse

Portland, Ore.
Glumac

Glumac has designed numerous rainwater harvesting/reuse systems, but none as ambitious as the system currently in place at the recently completed 14th and Everett project in Portland, Oregon. The five-story, full-block Meier and Frank warehouse was renovated to provide Class A office space with many green features. Designed by GBD Architects, the project is on track to achieve LEED Platinum certification. The large footprint and relatively small overall building size make this an ideal project to provide 100% of irrigation and flushwater needs for the building's estimated 700 occupants.

Rainwater is collected off of the eco- and built-up roofs using conventional roof drains and is routed through a storm filter located in the building. From there, it goes into a 147,000-gallon cistern located under the building. 81 percent of all rainfall is collected and reused, leaving 210,400 gallons draining to Portland's overtaxed combined sewer system. More than 530,000 gallons a year are diverted from the municipal systems. A duplex submersible pump controlled by a float switch pumps the recovered rainwater into the day/treatment tank. By utilizing low flow fixtures and drought-resistant plants, we were able to meet capacity with a small 1,600-gallon day tank.

Ultraviolet light and chlorine injection were both explored for treating the water prior to distribution. A chemical system was ultimately selected for its lower cost

Rendering: GBD Architects Incorporated

and ability to reduce odors. The system uses a probe to determine the chemical level in the tank, and a side stream approach injects the required amount of chlorine into the tank. The day tank also employs several float switches to control level alarms, fill and make up water from the utility for extended droughts. With the oversizing of the cistern, adding domestic water make-up is expected to be an extremely rare event.

A duplex booster pump is next in line, drawing water from the day tank and routing it through a duplex bag filter. Bag filters were chosen for their large capacity and lower cost. Cartridge filters are also a good choice if skilled maintenance people are not available. Recovered rainwater is supplied to the water closets and urinals in conventional copper piping with purple labeling. Irrigation water is separated via a double check valve and routed in purple PVC piping to planters and eco roofs.

University of Minnesota Amplatz Children's Hospital

Minneapolis, Minn.
HGA Architects and Engineers

The University of Minnesota Amplatz Children's Hospital provides a world-class, state-of-the-art children's healthcare facility in the Twin Cities. Part of an academic health center, the Children's Hospital is home to one of the nation's top 20 pediatric research programs.

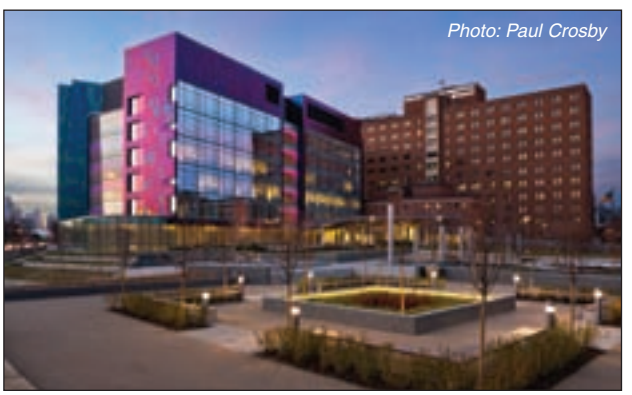


Photo: Paul Crosby

Designed by Tsoi/Kobus and Associates and HGA Architects and Engineers, the architecturally distinctive, 360,000-square-foot children's hospital includes a 320,000-square-foot addition and 40,000-square-foot renovation to existing space. The program features a seven-story bed tower with 96 inpatient beds, a two-story addition housing the Emergency Department, six operating rooms, the Imaging Center and the Pediatric Dialysis Center.

To meet the growing dialysis needs, HGA designed a state-of-the-art hemodialysis water treatment and distribution system serving the entire hospital. The system allows 30 inpatients to receive daily dialysis treatment in their rooms. In addition, it serves a nine-bed outpatient dialysis center, allowing 18 outpatients to receive daily treatment.

The client placed a high priority on monitoring, disinfecting and maintaining the system to meet ANS/AAMI RD62 standards.

During the design process, HGA worked with the facility staff and infectious control department to define dialysis requirements and the number of daily dialysis patients. HGA analyzed several types of hemodialysis water systems before choosing a state-of-the-art, non-chemical, reverse-osmosis heat sanitizing/disinfecting system that utilizes an automatic 180 F heat-sanitizing cycle to disinfect the system equipment and stainless steel piping distribution loops.

Based on patient room locations and available space, HGA determined that four heat-disinfecting hemodialysis systems were needed to serve the 96 inpatient beds and nine outpatient dialysis beds. Each system has a higher kill ratio of pathogenic, endotoxins and microorganism levels than a chemically disinfected system, produces 4,400 gpd of AAMI RD62 treatment water and stays within the manufacturer's pipe distribution loop limitation of 1,000 lineal feet. It reduces the time to disinfect system equipment and the pipe distribution loop from 8 to 10 hours to two to three hours, so the distribution loops are more readily available for patients' use.

The team also designed an aesthetically compatible custom connection box that works with the existing dialysis equipment.

The new Children's Hospital and hemodialysis water-treatment and distribution system have been successfully operational since 2011.

Warehouse Project

Des Plaines, Ill.
The Engineering Studio

In August 2011, members of The Engineering Studio were brought on board as part of a larger team to represent the owner of a large warehouse in Des Plaines, Illinois. A torrential downpour had caused 75,000 square feet of the approximately 365,000-square- foot roof to collapse, resulting in substantial damage to the remaining roof and structural members of the building.

In coordination with structural and civil engineers, architects and the firm, it was determined that the existing storm and site drainage system had been modified extensively since the building was constructed in the 1950s and was severely inadequate to handle most storm events. Exterior catch basins backing up into the interior loading dock area and into floor drains that were connected to an inadequately sized ejector was becoming more common. In addition, due to the collapse event, Des Plaines was requiring that the entire roof be retrofitted with secondary roof drains, which were previously non-existent.

Due to the inadequacies of the existing storm and site drainage systems, The Engineering Studio felt their only course of action was to tear up the entire existing system or retrofit the building with a siphonic roof drainage system. A majority of the warehouse was still operational after the collapse, and every effort was being made by the owner to keep the tenants on the property. They wanted to pursue the least intrusive option to repair the storm drainage system.

Continued on page 46

Top Projects

Continued from page 45

Once it was determined that the entire existing roof would need to be replaced, the decision to abandon the existing underground system and use a siphonic system was made. The siphonic system allowed them to avoid massive disruptions to the portion of the warehouse that was still being used by tearing up the floor. It also allowed them to maintain the desired clearance elevation of 15' within the warehouse as much as possible.

After exploring the site and looking for all existing obstructions, they began to carefully coordinate our design with the structural engineer, architect and a company called Siphonix, through the drainage product manufacturer MIFAB. The structural engineer determined that the existing roof structure could handle very little ponding, no more than two inches away from structural columns. In order to limit the amount of weight we would be supporting from the existing roof structure, Des Plaines city officials permitted the engineering team to use PVC piping instead of cast iron. All drains were located immediately adjacent to a column where as much as seven inches of water could pond.

A total of 41 primary and 41 secondary drains were spread over three primary drainage systems and six secondary drainage systems. The total discharge rate of the entire primary system was 12,345 gpm during a 4 in/hr rain event. Careful coordination had to take place between the primary and secondary systems and all existing electrical, fire protection and mechanical systems in order to maintain minimum warehouse clearances.

All of the interior portions of the new siphonic drainage system have been installed. The primary and secondary roof drains are being installed as portions of the roof are replaced. This work is still in progress, but the completed portions of the system are draining appropriately.

Creative Arts Building

Haywood Community College
Elm Engineering

Elm Engineering and Innovative Design worked together to design a three-story, multiple tier, 41,600-square-foot Creative Arts Building for Haywood Community College. Elm Engineering designed the mechanical, plumbing and electrical systems and is currently providing construction administration for the project. This LEED Platinum building is expected to use 89.7% less energy than the ASHRAE baseline.

One of the key Creative Arts Building innovative technologies includes low temperature hot water generated by the solar thermal panels to create chilled water for comfort cooling by way of an absorption chiller and a 15,000-gallon solar water storage tank. The unique challenge was creating an acceptable payback scenario, which included a weighted redundancy in lieu of complete system redundancy. To help the owner offset the initial equipment costs, a solar developer was acquired to become a key team partner.

Other key integrated green design features include a 120-panel heating water solar thermal system, a 50-ton solar thermal absorption cooling system, solar thermal radiant floor heating, an energy efficient building envelope and a 20-panel solar thermal domestic hot water system.

Google Data Center

Douglas County, Ga.
DLB Associates

DLB Associates, a consulting engineering firm based in Eatontown, N.J., led the design of a water reuse management system that supplies 100% recycled water to meet the cooling demands of Google's Douglas County, Georgia, data center.

The teams worked closely together to produce a reuse water management system that facilitated a mutually beneficial situation: The Douglasville-Douglas County Water and Sewer Authority (WSA) retained water and sewer capacity for future end users during high-demand months, while Google substantially decreased its overall domestic water use footprint.

Prior to the project, the facility used potable water from the WSA for their cooling needs. The first phase of the reuse water management system included the construction of a side stream plant or reuse treatment facility. The WSA treats wastewater from the local communities and discharges the treated water to the Chattahoochee River. The side stream plant intercepts up to 30% of the treated, or "graywater," and treats it further with additional disinfection/sterilization, as well as filtering and chlorinating it for use in Google's cooling infrastructure.

The water from the side stream plant is then pumped five miles via a new dedicated piping main to the data center to provide make-up water for the facility's cooling towers. The piping main was also constructed as part of the water reuse project. This first phase of implementation reduced Google's demand on the WSA's potable water supply and also freed capacity to be reallocated to other businesses and residents in the area, which can be especially critical during drought seasons.

The second phase of the reuse management system was building the effluent treatment plant (ETP) on the data center campus. The cooling tower blow-down, the water that is flushed out to remove mineral buildup in the towers after evaporative cooling, is sent to the ETP for treatment under National Pollutant Discharge Elimination

System standards. The primary processes of the ETP facility include a biological and chemical treatment system as well as a hollow fiber membrane filtration. The effluent water is then discharged into the Chattahoochee River in a cleaner state than before it was diverted from the WSA's treatment facility.

The second phase implementation removed a significant amount of volume from the county sewer collection system, which was approaching local capacity limits. It also decreased the amount of effluent water that needed to be treated by the WSA after use at the data center.

Expounding on the success of the project, the executive director of the WSA stated that, because of the reuse management system, the data center now consumes less potable water than many local restaurants. The hope is that this first-of-a-kind, collective project will inspire other companies to take the leap forward in sustainable and alternative designs that can benefit everyone in the community.

UW–Madison's South Campus Union

Madison, Wis.
Arnold & O'Sheridan

The entire University of Wisconsin system has embraced sustainable green design and practices as a core institutional value. The strength of that commitment is fully demonstrated in UW–Madison's new South Campus Union. The award-winning facility is designed for maximum sustainable performance, literally from top to bottom.

One of the building's key features is a green roof that filters rainwater. The quality of the filtered rainwater is being closely monitored by faculty to determine the overall effectiveness of the green roof design. The green roof drainage and standard roof drainage within the building are piped separately to monitoring stations to determine whether the green roof filters the water well enough to meet infiltration standards. The standard roof water is also being monitored to measure the quality. This is a test site for the state that may help improve storm water management, reduce storm water runoff and improve storm water quality.

As the plumbing consultants for the project, Arnold & O'Sheridan understood that reduced water usage was to be a hallmark feature of the facility's sustainable design profile. This resulted in incorporating low-flow lavatory faucets, toilets, urinals and showerheads to reduce water use by approximately 32%, which equates to over 400,000 gallons of water per year.

The focus on reducing the impact of the facility's footprint on both the immediately adjacent and larger environments extends to the main commercial/institutional kitchen space. Located at the "bottom" of the facility, two of the largest capacity grease interceptors available were installed to reduce pollution loads and sewer backups in the surrounding neighborhood sanitary sewers. The interceptors also minimize any adverse impacts further downstream at the Madison Metropolitan Sanitary Sewer District's treatment plant. The challenge was to find space for the interceptors' holding tank on the very confined site. Arnold & O'Sheridan's engineers met the challenge by burying a highly durable pre-cast concrete holding tank under the building's truck loading dock. The tank is "honey wagon" accessible as needed.

Photo: Mary A. Raduenz; Memories by Mary

A storm water cistern was also installed on the site to collect roof water to reuse. As with the grease interceptors, finding space on the site was difficult. A&O found one space that was free of buried utilities, was accessible, would allow the building storm drains to collect into it and allow the overflow to connect to the storm sewer leaving the site. A 10,000-gallon tank was installed and is being used to fill the exterior water features in the spring and to provide makeup water during the operating seasons. This greatly reduced the requirement for potable water for the water features, further conserving on precious resources.

The Arbors at Baltimore Crossroads

Baltimore City, Md.
N.H. Yates

Located in the White Marsh section of Baltimore County, just 10 miles north of Baltimore City, Baltimore Crossroads @95 is a mixed-use development with the capacity to support more than six million square feet of commercial office, flex, research and development and warehouse space. An integral part of the development is

Continued on page 48

Continued from page 47

The Arbors, a 365-unit, luxury market-rate rental apartment home community that opened last November.

The Arbors was designed to LEED Gold certification standards, and the project's developer, Somerset Construction Company, put sustainability at the top of its specification list. "One of our main goals in the design of The Arbors at Baltimore Crossroads was to examine every aspect of its construction and determine innovative ways to incorporate sustainability across the board, as technology allows," explained Somerset's chief operating officer Neil Greenberg.

When the M/E/P design team began working on the Arbors at Baltimore Crossroads, several challenges arose. Central to the challenges was the fact that the buildings were all wood framed. Somerset specified a hydronic heating and cooling system as opposed to a split, forced-

air system but, according to Richard Grier, owner of the project's M/E/P contractor, Krick Plumbing, "Hydronic systems and wood buildings don't generally mix very well together. It's tough to route the pipe through the building; with big steel or copper you have an open flame literally inches from the wood, so there exists a strong possibility for fires."

Coincidentally, Grier had recently been introduced to Aquatherm's polypropylene-random (PP-R) pipe systems by the German pipe company's manufacturer's rep, N.H. Yates Co. Inc. Yates's Peter FitzGerald had explained that Aquatherm is relatively new to North America but has been used in PHVAC applications in more than 70 countries for nearly four decades.

While presenting the product to Somerset Construction officials, Grier explained that the heat fusion connections used with Aquatherm pipe do not involve open flames, which was crucial due to the nature of the project. Also, due to the pipe's excellent flow rates, the buildings' pipe systems could be re-sized, allowing the pipe to be installed without altering the ceiling height and walls. Grier said that the Krick crew was a bit apprehensive of fusing PP-R at first. "But once they went through the training and got out in the field," he added, "they'll tell you now they'd rather use that than anything else."

Following the completion of The Arbors, both Somerset and Krick expect more projects involving Aquatherm. Meanwhile, Yates has seen extensive success with the PP-R product line, deploying it in a multitude of applications throughout its large regional territory.

For his part, Grier acknowledges the importance of a superior material but credits his talented and adaptive team, which included project manager Steve Harrison, general superintendent Paul Dlabich, job superintendent Tony Fitch and many others, with the project's success. "This job was supposed to be an 18-month job but was completed in 12 months, so they really accelerated the job," he said.

Kansas Star Equine Center

Mulvane, Kan.
JBA Consulting Engineers

The Kansas Star Equine Center in Mulvane, Kan. is a unique job that began as the casino phase of the project and is now in the process of being converted into an equine center, while an expansion for a future casino is being constructed. During design of the casino phase, provisions were made to help the construction phase when converted to the equine center. This included trench drains within the casino covered with solid grates for the future arena trench drains, heavy duty floor drains with solid grates located in back-of-house areas for washdown of the future penning areas and capped utilities for future service bars, hose bibs, post hydrants and restrooms.

All future expansions for the arena were taken into consideration ahead of time when sizing building sanitary sewers, domestic water and natural gas systems. Expansion to the equine center includes an outdoor, covered practice arena and three outdoor barns with more than 100 animal stalls in each.

Provisions were provided for an additional five outdoor barns and one future outdoor, covered practice arena on site. Plumbing design included drainage from the outdoor arena and outdoor barns for washdown to individual sand-oil interceptors. The drainage system for the equine center, outdoor arena and each outdoor barn was a separately engineered system that consisted of trench drains and heavy duty floor drains with no p-traps, piped with minimum 2% slope to each sand-oil interceptor. The interceptor itself acts as the trap for the system, with adequately sized venting at the interceptor to account for the entire system.

This design is intended to help eliminate backups in the drainage system due to each drain being located near dirt, hay and associated debris. Washdown will be provided from hose bibs and post hydrants within each barn and within the covered arena with underground water distribution located below the frost line to all areas. Site medium pressure gas distribution to each barn, covered arena and future area for domestic water heating and space heating was provided to each barn.

Domestic water distribution to restrooms and service bars with French drain receptors were provided to drain the domestic water systems during non-use times when temperatures are below freezing due to exposed conditions. Successful design was due to a collaborative effort from all groups and extensive coordination with the contractors on site, including multiple site visits to Kansas by JBA's Trusted Advisors™ .

Jekyll Island Convention Center

Jekyll Island, Ga.
TLC Engineering

Located at the main entrance of the new Jekyll Island Beach Village, the Jekyll Island Convention Center provides 128,000 square feet of prime oceanfront convention and meeting space. The center is integrated into its natural beachfront environment in a manner that minimizes impact on the environment, while creating a memorable experience for guests to enjoy for many years to come. The ribbon cutting and dedication was held on Sunday, May 20, 2012.

Comprised of state-of-the-art convention spaces, meeting rooms, pre-function spaces, offices and support spaces, the Jekyll Island Convention Center is seeking LEED® NC 3.0 Silver certification. Environmental-friendly aspects include:

- A rainwater harvesting system consisting of 80,000 gallons of rainwater and condensate from 460 tons of cooling capacity being harvested for toilet/urinal flushing and irrigation purposes (three tanks; 30,000 gallon, 50,000 gallon and a 1,000-gallon day tank).
- A solar water heating system, a 2,500-gallon hybrid water heater tank (Solar/LP Gas) supplying banquet kitchen, laundry and all back-of-house hot water demand.
- Exterior lighting that complements the surrounding buildings while highlighting the new convention center. Special attention was given to the fixtures to avoid negatively impacting turtle nesting on the adjacent beachfront. The electrical system, consisting of a 4,000-amp switchboard that feeds multiple distribution, lighting and appliance panels, was designed to enhance the relaxed beachfront atmosphere.
- The building's high-efficiency cooling system is supported by two 200-ton nominal chillers. All air handlers use two-way chilled water control valves to match water flow with building cooling demand. Ventilation to the building is through energy recovery units that are varied through demand control.

The $39 million Jekyll Island Convention Center also integrates security access control through card/keypad access systems and video surveillance through indoor and outdoor CCTV cameras. An audio/visual room stores all equipment and controls for the floor and wall-mounted audio/visual interfaces in all meeting rooms and the digital scheduling panels in the hallways. A voice/data system plays background music in common areas and can be used for paging.

The new Jekyll Island Beach Village includes Great Dunes Park and retail space, as well as hotels and condominiums. TLC has been an integral part of the revitalization of the island as a sub consultant to HHCP Architects Inc., Maitland, Florida. The owner is Jekyll Island Authority, and the contractor for the new convention center is Brasfield & Gorrie, Atlanta. TLC Engineering for Architecture provided MEP engineering, along with security, A/V and voice/data designs. TLC also provided energy modeling and LEED administration for the project.

OUS/OHSU Collaborative Life Sciences Building

Portland, Ore.
Interface Engineering

When completed, the Collaborative Life Sciences Building will be Oregon's premier, state-of-the-art, LEED Platinum teaching and research facility. Bringing together the state's leading public and private health and life science research resources, the 650,000 square foot project includes specialty research and education spaces; medical, pharmaceutical, and dental facilities; in addition to retail and office spaces. The Revit-designed project was incredibly fast-tracked, even for design/build, and required all team members to collocate at one location to ensure that deadlines were met and a true integrated design process was followed.

As the MEP engineer on this high-performance building, Interface is designed sustainable systems throughout the facility. Our plumbing design includes:

- rainwater harvesting system on two thirds of the facility
- greenroofs
- biowaste disposal system
- plus individual plumbing systems for DWV, sanitary

Rendering: SERA Architects and CO Architects

sewer, hot/cold domestic water, fuel oil, dental vacuum, dental air, waste anesthesia gas disposal, reverse osmosis, deionized water, storm water management, acid waste, non-potable hot/cold water, natural gas, carbon dioxide, oxygen, and nitrous oxide

- 900+ plumbing fixtures
- 2,400+ lab gas/med gas outlets
- 24.5 miles of piping, not counting the underground

Continued on page 50

Top Projects

Continued from page 49

National Oceanic and Atmospheric Administration (NOAA) Pacific Regional Center

Pearl Harbor, Hawaii
WSP Flack + Kurtz

Sustainability is one of the core principles at WSP Flack + Kurtz, an MEP consulting engineering firm established in 1969. The firm's plumbing unit and specialist high performance sustainable design team, Built Ecology, are both focused on smart ways to reduce water consumption through efficiency and water re-use strategies.

The 300,000-square-foot National Oceanic and Atmospheric Administration (NOAA) Pacific Regional Center located in Pearl Harbor, Hawaii, is an excellent example of WSP Flack + Kurtz' work currently in construction. The firm's design team is implementing both rainwater collection and greywater treatment to offset toilet, urinal, and irrigation demands for the Center.

A key to water efficiency for the project actually started with the design of the HVAC systems. During the early goal setting phases, project stakeholders emphasized a strong desire for a healthy indoor environment focused on utilizing 100% outside HVAC systems. Based on these goals, a passively-driven, 100% outside air displacement system was selected for the main building HVAC system. For the 20% of the building occupied by its laboratory spaces, a 100% outside air chilled beam system was chosen.

With the warm and humid Hawaii climate and 100% outside air systems selected, it was clear to the team from the early stages that condensate flows from the HVAC systems were going to be substantial. Because of this, they decided to collect the condensate, along with shower and lavatory flow, for greywater treatment and re-use for irrigation demands. The system includes a 10,500-gallon tank where a combination of ultra-violet and sodium hypochlorite treatments are used to treat the water prior to use in irrigation. While the flow of condensate will vary seasonally based on climate, the average flow of condensate is expected to be 5,000 gallons per day, with even higher flows during the hotter, more humid months (July through October). This works to the project's advantage as the highest condensate flows occur during the period when irrigation demands are at their greatest.

While WSP Flack + Kurtz designed the greywater system to supply the large irrigation demands on the site, rainwater collection was implemented for toilet and urinal flushing. The rainwater collection system includes a 40,000-gallon tank and associated treatment to service toilet and urinal flushing demands throughout the building.

Overall, the greywater treatment system is able to provide 100% of the project's irrigation demand; no potable

water connection was included in the design of the entire site's irrigation systems. In addition, the rainwater collection tank is able to meet nearly 40% of the building's toilet and urinal flushing demand, an average of over 800 gallons per day.

Walter Reed National Military Medical Center

Bethesda, Md.
Southland Industries

Under the design-build contract awarded by the Naval Facilities Engineering Command, Southland Industries teamed with general contractor, Clark/Balfour Beatty, during the relocation of the Walter Reed Army Medical Center. The facility moved from its former location in Washington, D.C. to the National Naval Medical Center campus in Bethesda, Maryland—and evolved tremendously in the process. Not only did this project achieve LEED Gold certification, it was named the USGBC-National Capital Region New Construction Project of the Year.

From the start, waterborne pathogen prevention and control was a major concern for Southland, considering the plumbing system created was to be housed within a medical facility environment. Balancing minimized water consumption with infection control while eliminating the risk of scalding users required a strong effort. The guidelines laid out in UFC 4-510-01 Design: Medical Military Facilities provided a great starting point for meeting the owner's minimum requirements, but the end results show that Southland went above and beyond the minimum.

Southland's design features domestic hot water that, once run through a shell and tube heat exchanger off the heat recovery chiller, is generated by the use of plant steam through semi-instantaneous water heaters. Minimizing stagnant storage conditions, this solution also works to maintain energy efficiency.

The domestic hot water, which is generated at 140 degrees Fahrenheit, holds the capability to thermal shock the system at 160 degrees or higher, if required. From the

water heaters, the domestic hot water system is routed through state-of-the-art digital mixing valves, giving the maintenance staff real-time readouts of the current temperature conditions, as well as the ability to adjust hot water temperature from 110 to 126 degrees—at the discretion of the infection control officer. Southland's domestic hot water system was also laid out to minimize the amount of dead leg pipework, and contains a hot water return with a 5-degree temperature drop was designed across the system, too.

Another component of the design was to incorporate copper-silver ionization into the hot water return system to provide water treatment. Southland chose copper-silver ionization as a result of conversations with industry experts verifying it provided the best form of legionella control, as well as an easily maintainable water treatment system.

Water efficiency for the project was achieved through the use of dual flush water closets, low flow urinals, low flow showerheads, and the use of laminar flow manual faucets, where deemed acceptable by the owner.

In addition to the infection control and water sustainability measures Southland took, another issue was faced in regard to backflow prevention. Since the incoming water service was brought into the building through the basement, it was essential to provide a dual RPZ backflow preventer. Southland's concern with the device was potential basement flooding. With discharge rates in the range of 850 gallons per minute in a backflow condition, that would ultimately deem the hospital unusable. In addition to proper drainage, the solution was to provide a water detector to monitor the discharge of the RPZ device and cause the solenoid valve to shut off the feed in the case of a backflow condition.

Curt Eisenhower, Dennis Cavallaro, Mike Kirkpatrick and Elizabeth Snyder led this design, and showed the passion was Southland Industries possessed in providing a state-of-the-art medical facility for the many troops returning home.

Northern Wake Campus

Wake County, N.C.
Clark Nexsen

A new community college campus afforded Wake Technical Community College (Wake County, NC) an opportunity to develop a sustainable environment in which to study and work. Goals were established and strategies identified for how the campus would conserve water, maximize energy performance and preserve natural resources. To that end, the Northern Wake Campus is constructing its fifth building on the campus with a goal of LEED Gold certification by the US Green Building Council. The college is already realizing the tangible benefits and cost savings of its green campus, and is the first campus in the United States to have certified all of its buildings, making it the first fully LEED campus in the country.

Clark Nexsen Architecture & Engineering of Raleigh, N.C. was awarded with the design of the new 80,000

square foot general classroom building on the Wake Tech North Campus with an estimated construction cost of $18 million. This facility is four stories and includes a 300-seat lecture hall and associated pre-function area that will employ the following sustainable design strategies:

Energy Performance

The project has been designed to reduce total energy consumption through the implementation of several strategies. Some of these include:

• Increased building insulation at roof and wall surfaces, and use of high efficiency mechanical systems, resulting in a 57.7% reduction in annual energy consumption when compared to a baseline building of similar size and configuration as constructed in accordance with ASHRAE 90.1.

• Extension of roof overhangs and installation of sun shading devices along the southern and western façades of the building will help to reduce building energy consumption.

• Development of an integral green roof will provide added roof insulation to a large portion of the facility, further reducing the buildings energy consumption and limiting stormwater runoff.

• Monitoring of building mechanical equipment and lighting via occupancy sensors, day-lighting control sensors and a building management system which ensures that optimal energy consumption is adjusted based upon environmental conditions.

Mechanical Systems

• Unique mechanical systems have been incorporated into the design of Building E to further exceed baseline building demand for heating and conditioned air. These include the use of displacement ventilation within the lecture hall and a radiant flooring system within the pre-function area that provide both heating and cooling to this high volume space, dependent upon the demands of the space.

Water Conservation

The project has been designed to reduce total water consumption through the implementation of several different strategies. These include:

Continued on page 52

Top Projects

Continued from page 51

• The planting of indigenous, drought-resistant plant materials, resulting in a landscape where no potable water will be utilized for irrigation.

• Use of electronic dual-flush water closets, ultra low-flow urinal electronic flush valves, low-flow faucets and low-flow showers will reduce yearly consumption of potable water by approximately 205,000 gallons per year, resulting in a 47.8% reduction in annual water consumption when compared to a baseline building of similar size.

• An integrated secondary piping and water treatment system has been designed into this facility for connection to a future reclaimed water utility which is planned by the local municipality. This utility will provide reclaimed water to all flushing fixtures and will result in further reductions in the use of potable water for this facility, when connected.

Coral Reef Ecosystems Science Research Facility

Ft. Lauderdale, Fla.
Cannon Design

A new research facility for the Center of Excellence for Coral Reef Ecosystem Science (CoE CRES), located at Nova Southeastern University Oceanographic Center (NSUOC) in Ft. Lauderdale, Fla., will be the only research facility in the United States dedicated to coral reef ecosystem research. Funded in part by a $15 million stimulus grant from National Institute of Standards and Technology (NIST), the $38 million facility CoE CRES will encompass all disciplines required for integrated coral reef studies, including geospatial analysis and mapping, biodiversity, plant and animal studies, genomics, and hydrodynamics. The 87,000 SF building will also help CoE CRES significantly increase the quality and quantity of its research and education by replacing outdated facilities, increasing funding options by attracting world-class faculty, and fostering an entrepreneurial, multidisciplinary, collaborative culture through partnerships with other academic institutions and with federal and Industry partners.

To meet CoE CRES's diverse research requirements, the building includes a lab block with a "spine" of flexible, adaptable laboratory spaces capable of accommodating a wide variety of lab types, ranging from highly wet, seawater-based environments to dry spaces for data and image analysis. Alongside the rectilinear lab block, another block with a façade of sweeping glass arcs inspired by ocean waves contains a range of collaboration and social spaces, a research library, offices, and fieldwork staging and preparation areas. At the intersection of the glass waves are exterior terraces with water views, and interior informal spaces

for collaboration and team research.

One of the key components of the CoE CRES is the seawater treatment and distribution system. Raw seawater is pumped from two wells on the site into a 5000 raw seawater treatment tank. The seawater is then sent through a 24-48 hour treatment process through sand filters and protein fractionator/ozone treatment to clean the seawater to a usable level. Once the optimal quality of seawater is achieved, the seawater is transferred to a 5000 gallon clean seawater tank and is circulated around the building via a 750 gallon "degass tower" tank, located in the building penthouse, then by gravity back down to the clean seawater tank. As it is prepared for distribution to the tank in the penthouse, the clean seawater is continuously processed with UV light sterilize the water, through a phosphate reactor to remove built-up phosphates and through a heat exchanger to regulate the temperature of the water to a constant 25 C. Each of these processes can be seen in the Seawater Schematic of the system.

Another component of the building is the Outdoor Research area and Coral Nursery. Additional treatment is used to provide the coral with an excellent environment in which to grow. The flexibility of the various seawater systems will give the researchers the ability to utilize varying water quality in their research.

A treatment system is also utilized to remove any exotics or other substances that may be added to the seawater prior to being disposed. ■

Options With Drainback Solar Hot Water

By Peter Biondo
Technical Sales Coordinator
Oventrop Corporation

Since the early1980s, solar hot water collection by drainback has undeniably been a reliable, efficient and low maintenance system. Drainback technology has matured to offer sensible design options.

In this article, we will explore innovations to drainback systems that build on the expectations that most solar design builders desire; flexibility, simplicity, longevity and economy. The information about advances in drainback noted here results from speaking with industry specialists throughout North America who have a thorough working knowledge of these systems and, in many cases, have determined that drainback is the optimal choice in solar hot water collection. This opinion is shared by "new" generation solar designers who work with both custom closed loop and drainback system designs.

I work closely with a young design engineer named Russell. He makes it clear to me that drainback is simpler to design, requires less maintenance and is installed at a lower cost. At 26, Russell has five years experience in active solar design, primarily with commercial closed loop systems. He is a sensible designer who understands the advantages and disadvantages of drainback and closed loop systems and prefers to design for drainback when the option is available.

Designed for "fail safe"

Drainback is regarded as a "fail safe" system. The collectors remain empty outside of collection cycles. Empty collectors are protected from freezing water breaks in the cold season or from steam generated by high temperatures of the transfer fluid. Because they are empty, there is no harm to the collectors when the system is not operational.

In contrast, closed loop systems contain a circulated pressurized glycol solution that requires vigilant maintenance. To prevent stagnation of the working fluid, more attention to detail is required. In order for closed loop systems to be fail safe, the glycol would have to be contained or drained if the pumps shut down, and a shutdown would possibly need to be followed up by a service call.

In a closed loop system, the collectors can be installed anywhere in relation to the solar tank or heat transfer. Collectors for drainback, on the other hand, must be mounted above the drainback reservoir, although not necessarily above the solar storage tank. Drainback works well with most roof mounted collectors, since the working fluid can drain back by gravity into the reservoir. To ensure draining by gravity, drainback design should include the specification that there should be no slope ratio on the collectors and that piping be secured dead level to a roof.

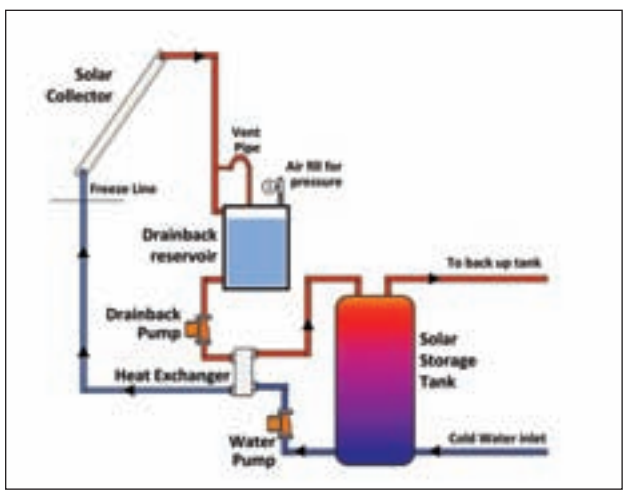
It is advisable to add freeze protection (propylene glycol) to the drainback reservoir to prevent the potential freeze that could occur if the array piping sags over time. Dead level installs are often used for rooftops with large collector arrays and large diameter supply and return piping. An excellent example of dead level drainback is the largest domestic hot water system in the state of Wisconsin, located at the Kalahari Resort in Wisconsin Dells. The rooftop is home to 104 vertically-mounted flat plate collectors installed dead level.

Efficiencies gained

Savings in drainback pump first cost and operating costs can be made when selecting the drainback reservoir location. A drainback pump has to lift a column of water from the reservoir to the top of the collectors. The greater the height of the lift, the greater the pump horsepower needed. High lift and greater pump horsepower can be expensive.

Overcoming lift can be an expensive problem when drainback reservoirs are installed in a basement or on a lower floor of a high-rise building. To avoid this problem, the drainback reservoir should be mounted at a high elevation, such as on the top floor. The system pump does not have to be raised with the drainback reservoir but can

Continued on page 56



Drainback with external heat exchanger

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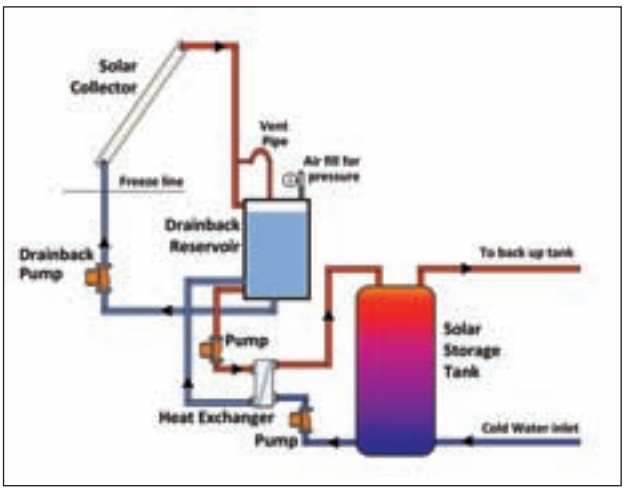
28 on Reader Reply Form on page 65

Drainback

Continued from page 54

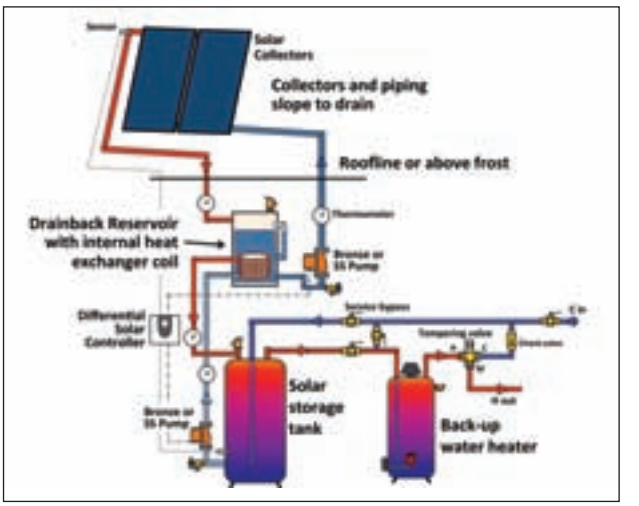


Separating the drainback loop from the hot water transfer loop

be installed in the mechanical room with the controls. Installing the reservoir somewhere below the rooftop under the freeze line will allow you to take advantage of smaller pump sizing. I have heard of drainback designs including ridiculously large and very expensive pumps because the engineer did not understand that pump lift requirements are smaller if the reservoir in a tall building is at a high elevation.

Another option for savings is to have two pumps installed on the drainback loop. At start-up, pump 1 energizes to "on" and pump 2 energizes with an "on, time delay to off" sequence. At start-up, both pumps are needed to overcome total lift; to push the air bubble out of the collectors and into the drainback reservoir. Once the air has been displaced into the drainback tank, considerably less lift is required for circulation. The pressure drop requirement is lowered and system circulation becomes comparable to a closed loop system. Once water is flowing throughout the loop, the second pump is "time delay to off" until the next cycle of solar collection begins and total lift is required once again. This option allows for the use of smaller, less expensive pumps and increases electrical efficiency.

EPDM lined atmospheric drainback tank with copper heat exchanger coils



Drainback reservoir with internal heat exchanger coil

A variety of options are available for the mechanical transfer of energy from the drainback reservoir to the solar storage tank. Drainback thermal transfer may include a heat exchanger in the drainback tank, a heat exchanger in a hot water storage vessel or an external heat exchanger.

Drainback reservoirs are sized large enough to displace the volume of air in the collector loop with water while maintaining a flooded drainback pump. If there is a coil heat exchanger in the drainback reservoir, it must be completely submerged during the collection cycle. Normally a site glass on a drainback reservoir is used as a gauge for fill. Drainback reservoirs are manufactured in 10-, 15-, 20-, 40- and 60-gallon sizes, with stainless steel tanks.

Reservoirs for larger arrays may be piped together in parallel to accommodate volumes over 60 gallons or when port capacity requires more flow (port size may be limited to ¾ or 1 inch). It is standard practice to install the drainback reservoir on a wall stand above the solar storage tank. This helps position the drainback pump below the bottom of the reservoir. The pump should be installed vertically and should pump against gravity to avoid pump cavitation. For better pumping characteristics, a drainback loop can be sealed closed so that it is airtight and the entire loop charged to 10 psi or more. Pressurizing a drainback closed loop raises the boiling point while compressing entrained air out of the working fluid during circulation.

For larger systems with an external heat exchanger, two pumps may be incorporated on the drainback reservoir; one for the solar collector loop and the second for the reservoir heat exchanger loop. This design separates two (usually high) pressure drops into two loops. Separating the loops helps size for smaller pumps and enables a more efficient control sequence for heat transfer, since the drainback tank can now be first "primed" with heat, prior to transfer to the solar storage tank.

External heat exchangers allow for additional flexibility with the installed location of the solar storage tank. Since pressurized water is circulated from the heat exchanger to the solar storage tank, the solar tank can be

installed in any location relative to the drainback tank. Limitations may occur for long pipe runs and heat loss but, if necessary, a solar storage tank may be installed above the collector height.

Many early large drainback systems had insulated fiberglass-reinforced plastic tanks, which are still quite popular today. Water from these tanks flows directly into the collectors. These tanks contain stainless steel or copper heat exchange coils sized in length to accommodate a large enough surface area for a sole pass high temperature rise. As an example, cold water is preheated through the submerged coils in the atmospheric tank, raising the cold inlet temperature close to the solar tank temperature en route to the backup water heater.

Drainback tank with optional heat exchanger

Active solar hot water heating designed properly is an efficient method to collect, store and distribute solar thermal energy. As the solar thermal industry matures, drainback will most likely gain higher ground and increased market share for commercial systems due to the most basic demand of building owners and their maintenance staff; desire for a high performance system with a long life cycle, designed for low maintenance and priced for value.

Owners may be uncomfortable with a closed loop system if the building's hot water load varies or shuts down from time to time, such as in a school. Those manufacturers, designers and installers who don't get involved with drainback will do just fine with closed loop system design and installation. But those who have a complete knowledge of both system types have an improved opportunity to satisfy their customers' requests for the simplicity drainback systems provide.

Both closed loop and drainback systems will satisfy performance expectations when designed and installed correctly. The question is which system is better suited for a specific commercial application and hot water load variations. Drainback could, in fact, provide simple solutions to some of the complex issues closed loop systems present. ■

Peter Biondo *is the technical sales coordinator for Oventrop Corporation.*

Circle 29 on Reader Reply Form on page 65

Sound Design in Drain, Waste and Vent Lines

By Paul Riedinger, MBA, LEED BD+C

The designer was working late in her office on a difficult hospital project. She had a tight deadline and was struggling with a tricky problem. In an attempt to concentrate, she closed her eyes, but there was no silence. The vending machine in the cafeteria hummed and the fan from the A/C system produced an annoying, squeaking sound. A siren in the neighborhood shrilled and a squeaky door opened by the cleaning crew caught her attention. Someone from a floor above her flushed the toilet, and the noise resonated throughout the building. Already under stress from a long day and an impending deadline, she realized the effect of noise on her productivity.

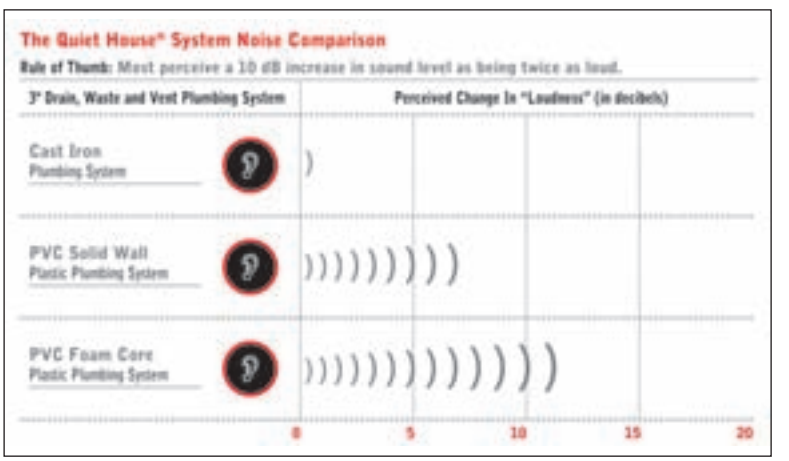
Safety, reliability and cost effectiveness are key components that drive plumbing design. In addition, environmental quality, acoustics and sound attenuation should be considered in the planning of commercial projects. Designers of commercial buildings should be aware of the acoustical performance of the facility and be very cautious of the potentially negative effects of value engineering during the process. Excessive noise from plumbing systems is typically unnoticed until the building is occupied, creating ongoing problems for the occupants.

Sound attenuation is regularly value engineered out of jobs, often the result of product substitutions and misguided cost cutting. While most building designers cringe when they hear the words value engineering, it has become an integral part of how projects unfold. Developers and owners salivate when contractors propose substituting products or methods, while the professional engineers who stamp the design documents worry about the unanticipated consequences. This is an especially sensitive subject when you consider the combination of a slower economy and the nature of the litigious society in which we work and live. Yet the questions linger: What are the consequences of substituting one product for another? Will the owner ultimately get what he wanted in his original design?

If there is going to be value engineering, it should be utilized with the proper methodologies. Genuine monetary savings, while keeping the integrity of the design, are more easily obtained if the VE process is used early in the design, when potential pitfalls can be readily identified by the design professionals. Unintended consequences, such as unacceptably loud drain lines, often result from late-term value engineering. Changes made late in the construction process may benefit the owner very little, if at all, and may have little or no input from the original designers. The result is often myriad Band-Aid solutions, which create additional issues such as inadequate design input, additional material usage, labor charge overruns, busted timelines and a great deal of annoyance for all parties involved in the process.

I was involved recently with the "Band-Aid" side of a dormitory project at a small liberal arts university in the Midwest. The engineer specified cast iron soil pipe for the drain lines, and the plumbing contractor suggested the cost savings measure of substituting plastic drain lines to the general contractor and to the owner, a change that they accepted. Soon after the university took possession of the facility, students began complaining of excessive noises when their dorm neighbors flushed toilets or took showers.

The quick fix was an unproven retrofit of insulation around the pipe. The design team struggled with how to keep the sound from resonating through the studs in the wall without removing the pipes and drilling larger holes. The owner even considered removing the drain lines and replacing them with quieter cast iron soil pipe lines. After a great deal of extra time, energy and money, the contractor ended up cutting holes in a number of walls and stuffing sound baffling around as much of the PVC pipe as they could reach.



Sound attenuation concerns are not limited to dormitory living. The hospitality industry, hospitals, convalescent facilities, multi-family homes, schools, prisons and other commercial buildings should also pay special attention.

In 2007, *USA Today* surveyed hotel occupants to identify the most annoying sounds they were subjected to while spending the night away from home. The number one most annoying sound was toilet flushing, followed by construction repair, coughing/retching, snores/burps and hiccups.

Continued on page 60

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Sound Design

Continued from page 58

One could argue that each of these complaints is avoidable and results from inappropriate materials being substituted, due to short-sightedness and errant costing.

A 2008 survey by A.H. Jha in *The New England Journal of Medicine* showed that patients in healthcare facilities identified the noise levels around rooms at night as the quality of care factor with the most room for improvement. This is especially true in hospitals with multiple levels. In these structures there are additional opportunities for potential noise pollution from water evacuation from toilet flushing, mop sinks, shower and storm drains. Excessive noise can lead to sleep disruption and increased levels of stress for both healthy people and people struggling in a hospital bed.

Correctional facilities have discovered that noise levels have a direct correlation on the stress levels and activities of the inmates and the staff. As a result, the American Correctional Association has created noise standards limiting daytime noise levels to less than 70 decibels and night levels to less than 45 decibels.

Similar research by the Acoustical Society of America has shown that children in schools learn better and perform at higher levels when background noise is kept at levels below 50 decibels. ANSI Standard S 12.60-2002 Design Requirements and Guidelines for Schools recommends a maximum of 35 decibels for background noise. This is roughly equivalent to the sound of a soft whisper at a distance of two meters.

While plumbing noise has been a major distraction in nearly all types of housing for years, condo and apartment residents suffer the most. Single-family home dwellers can typically run showers, laundry and dishwashers on their own schedule so as not to interfere with meals and sleep time. Multi-unit residents do not have the same luxury; they must live with the water use practices of their neighbors. This problem is often compounded by water lines installed within shared walls or in very tight spaces right up against the drywall or studs.

What causes sound in a plumbing system?

According to Jon Mooney's article, "Flushing Out Plumbing Noise," plumbing noises are the result of cavitation, impact, drainage and hammer. He adds that drainage noise is caused by the rush of water and air through traps and drainpipes. Mooney argues that metal drainpipes, such as cast iron, perform better than plastic at insulating noise from the surrounding structure.

Many facilities also struggle with the mysterious "ticking noise" of plastic pipes. They are often unaware that plastic pipe will expand and contract as a result of changes in temperature. Designers and contractors must design and install plastic piping with consideration for movement by utilizing either expansion/contraction joints or loops. This can be difficult to engineer properly because of the relative size of the pipe, the necessity of maintaining proper pitch and the tight spaces in which the pipe is installed.

Proper design and installation of expansion loops is complex due to the variables involved. These variables include the coefficient of linear expansion (which varies for each plastic material), temperature differential between the minimum and maximum the pipe will be subjected to, length of the run, modulus of elasticity at maximum temperature (which varies for each plastic material), working stress at maximum temperature (which varies for each plastic material) and the outside diameter of pipe. In contrast, cast iron will expand and contract at roughly the same rate as concrete pipe; virtually not at all.

So, how does a designer mitigate sound from their drain lines? Using sound-deadening pipe such as cast iron soil pipe is the easiest answer. Cast iron is a natural sound deadening material with a dense molecular structure and a natural heavy mass. According to a study by Polysonics Acoustical Engineers, cast iron is 750% more effective in silencing plumbing noise when compared to PVC. With cast iron soil pipe, sound is effectively muffled rather than transmitted, as it is with plastic pipe.

Mooney suggests that you can also mask the sound with plastic pipe by utilizing sound-deadening insulation that is carefully installed with neoprene foam jacketing. He notes that careful attention should be given to pipe penetrations by utilizing rubber grommets. In addition, to keep sound from resonating through the walls of the building, plastic pipes should not be rigidly attached to the structure.

Sound and acoustic performance is also being reviewed in the green building industry. One of the major areas of focus for green design is designing a facility to maximize the indoor environmental quality for the occupants. LEED speaks to a number of goals including, but not limited to, increased ventilation and thermal comforts.

Under the LEED 2012 Rating System Draft a new credit for acoustic performance is proposed, which, if adopted, would include all new construction, schools, data centers, warehouses/distribution centers, hospitality and healthcare. While a bit confusing at first glance, this change would adopt similar wording as that in the previous version of LEED, which included maximum sound levels for LEED for schools.

As you can see, significant research has gone into the study of sound and its effect on building occupants. Noise pollution can lead to stress, hypertension, indigestion, sleep and memory problems and more. While sound is often overlooked during the design process, designers can solve this problem by specifying products and systems that naturally deaden sound.

Conclusion

The acoustical performance of the plumbing system should not be bulldozed by the value engineering process and should be thoroughly considered before giving in to the promise of cost savings. There is value in quiet pipe performance. Plumbing designers should be cautious of significant deviations from their original design intentions. Experience can provide an expensive education with regard to the unintended consequences of hasty decisions. Designers beware: Excessive plumbing noise typically isn't a problem until after the building is occupied. Satisfying dissatisfied occupants by cutting holes in walls is not a simple process, and it is rarely inexpensive. ■

***Paul Riedinger**, MBA, LEED AP BD+C, is a Field Technical Manager for Charlotte Pipe and Foundry, Co.*

Product News

Plumbing Engineer's Product of the Month

Balance valves

Xylem announces the introduction of its complete line of Bell & Gossett Lead-Free Circuit Setter Plus balance valves for plumbing systems. The entire line of Circuit Setter Plus balance valves meets the requirements of California's AB1953 and Vermont's S152 legislation, and exceeds the current requirements in the other 48 states. Designed specifically for pre-set proportional system balance, the Circuit Setter Plus line features integrated pressure/temperature ports to easily verify the flow rates and temperatures. This innovative system balance method, which was developed by Bell & Gossett, assures optimum system flow balance at minimum energy consumption and total water usage. **Xylem**.

Circle 100 on Reader Reply Form on page 65

Sump pumps

Goulds Water Technology has enhanced its line of submersible sump pumps with the addition of two energy-efficient residential STS sump pumps. The STS sump pumps are available in two models, the STS21 (1/4hp) and the STS31 (1/3hp). The STS pumps are stainless steel and feature less amp draw for greater energy efficiency. Designed primarily for the plumbing and contractor market, the STS pumps provide a superior pumping solution at 38GPM for basement draining, dewatering and water transfer applications. **Goulds Water Technology**.

Circle 101 on Reader Reply Form on page 65

EMT water heater line

Eliminate the number of dissatisfied customers by integrating the Eemax Mini Tank line of Water Heaters. Gas tankless water heaters are susceptible to the annoying cold water sandwich effect. Remove it by connecting an Eemax EMT tankless water heater to the gas heater's hot water outlet. Eemax mini tanks blend the cold water sandwich within the compact hot water tank, so you get ideal hot water temperature. **Eemax**.

Circle 102 on Reader Reply Form on page 65

Pumping System

The Grundfos BoosterpaQ® Hydro MPC is an integrated pumping system that offers up to six vertical, multi-stage CR pumps in parallel operation designed to optimize pumping efficiency over a range of flow rates. These pumping systems are ideal for domestic water pressure boosting, industrial process, irrigation and HVAC applications. The integrated pumping systems utilize an advanced controller that adjusts pump speed and the number of pumps in operation to meet frequently changing system demand. **Grundfos**.

Circle 103 on Reader Reply Form on page 65

Showerheads

The Speakman Anystream® Vintage™ Showerhead is a signature showerhead, constructed of solid brass that functions off of the innovative Anystream® 360°™ spray technology. By simply adding an octagonal concave cut into base of the showerhead, the new design becomes unique and sets the pace for a modern vintage appeal in the bathroom. **Speakman**.

Circle 104 on Reader Reply Form on page 65

WS Series Control Panels

The WS Series™ control panels are advanced simplex and duplex systems controlled by SEEwater's "Smart Board" designed for wastewater and sewage pump applications. SEEwater's WS Series™ panels come standard with: NEMA 4X enclosure, upgraded pump protection, pump fault indicators and auxiliary contacts for accessing building management systems (SCADA). Custom options are available upon request. **SEEwater.**

Circle 105 on Reader Reply Form on page 65

Continued from page 12

paper highlights considerations that impact which type of technology is most appropriate for various restroom environments, including:

• High or low restroom traffic

• Water quality, including the pH of the water and chlorine concentration

• Operating conditions, such as high or low water pressure systems

Sloan invented the diaphragm flush valve more than 100 years ago and introduced piston valves about 20 years later. Today, Sloan manufactures both diaphragm and piston flush valves in sensor-activated and manual models. Diaphragm flushometers include the Royal®, UPPERCUT®, Regal® XL and Sloan® brand valves; the Crown® and GEM•2® valves are piston operated.

Sloan offers flushometers for every type of environment from normal restroom applications to extremely harsh water conditions. To help you determine which type of flushometer valve is best suited for the variety of restroom environments, download a pdf of the "Diaphragm or Piston Flushometers? It Depends ..." white paper at http://bit.ly/Kl3oKk.

Little Red Schoolhouse reaccredited as provider of IACET CEUs

MORTON GROVE, ILL. — The International Association for Continuing Education and Training (IACET) has awarded reaccreditation status to the Bell & Gossett Little Red Schoolhouse®. IACET Authorized Providers are the only organizations approved to offer IACET Continuing Education Units (CEUs). The accreditation period extends for five years and includes all programs offered or created during that time.

For nearly 70 years, Bell & Gossett has led the industry in providing high-quality continuing education programs focusing on HVAC and plumbing. The Little Red Schoolhouse focuses on building expertise in key system applications, including pressure boosting, heating, cooling and filtration and also provides training in new water- and energy-efficient technologies such as solar thermal, geothermal, rainwater harvesting and reuse.

Since 1954, more than 55,000 engineers, contractors and installers have been trained in the Little Red Schoolhouse's fully equipped learning center in the Chicago suburb of Morton Grove, while another 150,000-plus professionals have received training through Bell & Gossett's "traveling classroom" program. Graduates of the Little Red Schoolhouse can be found in every state in the U.S. as well as in Europe, the Middle East, Asia, Latin America and Australia.

In order to achieve Authorized Provider accreditation, Bell & Gossett completed a rigorous application process, including a review by an IACET site visitor, and successfully demonstrated adherence to the ANSI/IACET 1-2007 standard addressing the design, development, administration and evaluation of its programs. Bell & Gossett has pledged its continued compliance with the standard and is now authorized to use the IACET name and Authorized Provider logo on promotional course material. Bell & Gossett is also linked to the IACET website.

Speakman showcases new products

NEW CASTLE, DEL. — At the Hospitality Design Expo in Las Vegas on May 15 – 17, Speakman Company exhibited the full range of its bathroom plumbing products.

During the show, Speakman divulged their latest innovation, the Waterslide bar, which is set to launch in July. This unique showering system works by featuring a decorative slidebar which is installed to the water outlet, retrofitting a showerarm, allowing the water to flow through the bar and out the handshower. This provides the user with more space in the shower, creating a clutter-free atmosphere.

Speakman also showcased their latest shower and bath collections, which launched in Feburary. The Neo™, Rainier™, Caspian™ and Alexandria™ collections each delivers a distinctive style into the bathroom. Each ensemble of products includes a high performing Speakman showerhead, shower valve/trim and tub spout to complete the showering experience. The offering also features coordinated designer faucets and accessories, including a towel bar, a towel ring, two robe hooks and a toilet paper holder.

Leonard Valve brochure available

CRANSTON, R.I. — A newly-revised, 18-page color brochure highlights Leonard Valve Company's Megatron system, industrial hose stations and thermostatic shower valves, as well as the addition of ECO-MIX™ lead-free valves. An easy-to-use product selection chart is an added bonus that helps easily identify product options based on ASSE criteria.

Leonard's corporate capabilities brochure includes photographs, descriptions and specifications for a range of products for commercial and industrial applications.

IAPMO R&T promotes services at KBIS 2012

CHICAGO — At the 2012 Kitchen and Bath Industry show (KBIS) in Chicago, IAPMO R&T representatives visited with exhibitors and manned a booth promoting IAPMO R&T's comprehensive menu of product conformity assessment services, including UPC, cUPC and WaterSense® certification.

The booth was busy with existing customers seeking information on their listed products, adding new products to their certificates, opening new files for their latest products and inquiring about updates to the UPC and other reg-

ulatory issues. Prospective clients, seeking to secure the marketing advantage and code compliance ensured by achieving third-party product certification through IAPMO R&T, were also in abundance.

IAPMO R&T is accredited by the American National Standards Institute (ANSI) in the United States and the Standards Council of Canada (SCC) in Canada. This highest degree of integrity means IAPMO R&T's certification marks of conformity are recognized throughout North America.

KBIS 2013 will be held April 19 – 21, 2013, at the Ernest N. Morial Convention Center in New Orleans.

AHR Expo expands 2013 Dallas show

WESTPORT, CONN. — To meet the growing demand for more exhibit space from both new and current exhibitors, AHR Expo show management has reserved 40,000 additional square feet on Level 1 of the Dallas Convention Center for the 2013 event, taking place January 28 – 30. The world's largest HVAC/R show already encompasses the entire 2nd level of the Dallas Convention Center, with more than 350,000 square feet of exhibit space.

"We are thrilled by the response from so many companies so far in advance of the show," said Clay Stevens, president of International Exposition Company, which produces and manages the AHR Expo. "Many of our longtime exhibitors are expanding the size of their current booths, and nearly three dozen new companies have already reserved several thousand square feet of floor space."

Stevens attributes this increased demand to several factors; an improving economy, the need for information about new energy-efficient products and technologies, a return to the Dallas area, the need for industry education and the desire to participate in the HVAC/R industry's leading event.

With several months remaining before the show, more than 1,400 companies have already reserved space, putting it on track to surpass the last Dallas expo that set several Southwest records in 2007.

Lochinvar expands social media presence

LEBANON, TENN. — Lochinvar® LLC has established an enhanced social media program to foster increased interaction with industry professionals and provide new platforms for dialogue. As an extension to the brand's YouTube channel Lochinvar now has a presence on both Facebook and Twitter.

Through its latest social media initiative, Lochinvar plans to keep industry contacts up to date on the latest advances in technology, product introductions and innovative installations and to discuss industry topics and trends with followers.

Visit Lochinvar at facebook.com/LochinvarLLC and www.twitter.com/LochinvarLLC. ■

Armacell names CEO


Mathieu

MUNSTER, GERMANY — Patrick Mathieu is the new chief executive officer of Armacell International. Mathieu succeeds Stephan Kessel, who has had the role on an interim basis since 2011 and who will now return to his previous position as chairman of the advisory board. Mathieu held various management positions in the Saint-Gobain Group for over 20 years. Prior to moving to Armacell, he was president of the Western Europe and International Flooring Division within the Tarkett Group.

NIBCO COO joins board of directors

ELKHART, IND. — Steven Malm, president and chief operating officer of NIBCO INC., has been elected to the NIBCO board of directors. Malm will assume additional responsibilities as a member of the board during his one-year term. His career spans 30 years spent in the building construction industry, specializing in international business, mergers and acquisitions and general management. He joined NIBCO in 1996 as international vice president and, after advancing to several key positions, was appointed president and COO in 2006.

ICC names honorary ambassador

WASHINGTON, D.C. — The International Code Council Foundation (ICC Foundation) named HGTV celebrity Mike Holmes as the 2012 honorary ambassador for the 32nd annual Building Safety Month. Holmes, star of HGTV's Holmes on Homes and Holmes Inspections, will raise awareness of the importance of building codes and how they protect families by providing information to ensure that places where they live, work and play are safe and sustainable.

Bradley Corp. names president


Mullett

MENOMONEE FALLS, WIS. — Bradley Corp. has appointed Bryan Mullett president. Mullett continues Bradley's 90-year family leadership tradition, as he is the fifth generation of the Mullett family to hold the president title. After working with Bradley in a number of roles during the past 15 years, he most recently led its Fixtures and Accessories manufacturing and oversaw all aspects of corporate purchasing, quality and engineering. As president, Mullett will assume broader responsibility across the company's product groups, while implementing Bradley's long-term strategic vision and leadership plan.

Classifieds

FLUSHOMETER STORY

"Tiger in the Tank" by Bruce Martin is the story of the flushometer-tank that revolutionized North American toilet design and water usage. It is available online at Amazon.com; Yahoo.com; InfinityPublishing.com; Barnes & Nobel.com or your local bookseller. Soft cover - $16.95 + S&H; e-Book [for Kindle, etc.] - $9.95.

FPE Corner

Continued from page 32

and a comment form, visit http://bit.ly/Jryzu8.

The Gems Sensors and Controls Company, along with the Consumer Products Safety Commission (CPSC) have issued a voluntary recall of some of their pressure transducers that have been used in a number of different manufacturer's fire pump controllers. The news isn't actually new, but the CPSC issued the press release on April 24, 2012 in order to help spread the word about the concern over the product. Memos on the subject from Gems go back to at least November 2010 as they tried to get the word out to their customers about the potential problem (didn't you get the memo?). … The concern is over the Gems 3100 Pressure Transducer, which appears to experience upward "drift", with the sensor believing that the pressure in the system is higher than it really is. This could cause a delay in a pump set to start upon a drop to a specific pressure, or the pump might never start if the transducer does not recognize that the pressure in the system has dropped below the start point. Source: NFSA TechNotes, Issue 239, May 15, 2012. It appears this pressure transducer appears in several different manufacturers' products. ■

The views and opinions expressed in this column are those of the author and do not reflect those of *Plumbing Engineer,* TMB Publishing, or ASPE.

Advertiser Index

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1 I wish to receive (continue receiving) **Plumbing Engineer** for **FREE**
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2 I am engaged in plumbing engineering: ☐ Yes ☐ No

3 I am also engaged in the following kinds of engineering work:
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☐ Sprinkler/Fire Protection (d) ☐ Plumbing (e)

4 I am employed by one of the following:
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☐ Mechanical Contracting (k) ☐ Other (x) _____

5 My title is: ☐ Construction Manager (c) ☐ Engineer (e) ☐ Owner (o) ☐ President (p) ☐ Specifier/Design (s) ☐ Vice President (v)
☐ Other _____

6 Do you design and specify products? ☐ Yes ☐ No

7 I belong to the following professional organizations:
☐ ASPE (a) ☐ ASSE (b) ☐ ASHRAE (c) ☐ NSPE (d) ☐ Other (e)

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June 2012

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Letters to the Editor

Mr. Danaway:

Loved your article, "Ban the banners!" There are a few others that I would like to ban, but that's another story.

I sure hope the trade ups allowed by some of the codes are also banned. You mentioned the use of composite beams, but how about lengths of cul-de-sacs, street widths, reduced distances for fire hydrants, reduced water main sizes and higher density subdivisions? All of these trade ups can save lots and lots of money for the developer and home builder, but they are never mentioned.

A more subtle approach would be to increase all the above trade ups in the code with the option of reductions if residential sprinklers are installed. Another option would be a "green" tax, since fires increase pollution or a "firefighter tax" to hire more firefighters. Let the home builders' bean counters convince the builders that residential sprinklers would be a good choice. Are these any more ridiculous than the builders' arguments?

Just a thought!

Dave Baird
Office of the Illinois State Fire Marshal

Dear Editor:

I have just finished reading the April issue of *Plumbing Engineer*, and I must congratulate you and your staff for a terrific issue. I have been very involved in ASPE since the 1990s, and I could not put the issue down. It is a masterpiece of a very professional magazine, and it should help ASPE gain new members and retain the existing ones.

Just a few of the many points I noted: the styles, the topics, the ads, all add up to a class magazine. Having been involved with ASPE on most levels, especially the New Jersey chapter and the National Standard Plumbing Code, I have observed ASPE in action for more than 35 years.

Your articles are well chosen, so keep at it. ASPE must be a vital part of the industry. I am retired from active design work but not from ASPE. I meet with ASPE people from all over the country, and I have gained much and met some of the best people in the world.

Thank you for your efforts.

Very truly yours,
Raymond D. Lynch
PE, FASPE Life Member

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