

September 2003



Plumbing Design Class

Date: Tuesday, September 23, 2003

Time: 5:30 - 9:00 PM - Dinner and Plumbing Design Class

Cost: Members ASPE, ASSE: No Charge
Non-members: \$15.00

Location:
PMC Center
14801 W. 8 Mile Rd.

Topic: Sanitary and Storm Piping

Speaker: Ron George, CIPE/CPD
Ron George Design & Consulting Services

Sponsors:
Quality Water & Air
V.E. Sales

Please confirm your attendance through the web site at aspeemc.org e-mail to jll.dirksen@akalm.com or

PRESIDENT'S REPORT

**Douglas W. Cryer, CSI CIPE/CPD
President**



May I welcome you all back from another summer. That's right it's fall, back to class, colorful leaves, football, hockey, basketball, then snow. That's all I'll say about that topic, until I have to.

A topic I must talk about is our 2003-2004 year of technical courses. We will be focused on a High Rise Hotel design, with all of the pieces and parts that make up construction documents. Jill Dirksen, our incoming Vice President Technical, is continuing to hone our course syllabus, as I write this article. Please read her Vice President Report for further details.

Make sure to mark your calendars for **ALL** of our classes this year! We are aiming to get down to the calculations and applicable codes for all of our technical presentations, as well as, draw what we're talking about for each session. We expect another good mix of individuals for our classes, which will certainly bring many questions and comments on how or why our design is "as it is".

In addition, Bill Grayzar, Vice President Education, is putting together our special Technical Sessions to review and cover, in a more in depth manner, the basics of why systems are designed the way they are and to refresh and enrich your mathematical skills for taking the CPD Exam on April 24, 2004.

For your interest, the Eastern Michigan Chapter is going to have two silent auctions this year. So far I have been given a Just Stainless Steel Kitchen Sink, Just Gooseneck Kitchen Faucet, Speakman Showerhead, and I expect more items for display and bidding, prior to our first meeting of the year, on September 23, 2003.

May I take this opportunity to solicit any donated item for our homes from our manufacturer's representatives for the yearlong silent auction? The silent auction will require the technical meeting attendee to sign a sheet of paper for the listed minimum opening bid and others who want the same item will keep upping the ante until the December meeting. Somebody will leave the December 16, 2003 meeting with a nice

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American Society of Plumbing Engineers

Eastern Michigan Chapter 2003-04 Technical Classes

*Held monthly at the
(except where noted)*

PMC of Detroit
14801 West 8 Mile Road
Detroit, MI 48235

September 23, 2003 **Sanitary and Storm Piping**

October 28, 2003
Domestic Water Distribution, Boosters,
Treatment and Sizing

November 18, 2003
Commercial Laundry and Kitchen Requirements

December 16, 2003
Domestic Hot Water Generation Design and Sizing

January 10, 2004
First Saturday Technical Review Course (8 hours)

January 20, 2004
ASPE/ASHRAE Meeting at Compuware Arena for
Snow Melting and Plumbing for the Ice Arena

February 17, 2004
Professional Plumbing Practices, Estimating
and Test Taking Skills

March 23, 2004
New Michigan Plumbing Code Review
with Mr. Robert Konyndyk

April 3, 2004
Second Saturday Technical Review Course (8 hours)

April 27, 2004 - Architectural and Structural
Interferences, Coordination and
Value Engineering Panel Discussion

May 25, 2004
Open Microphone Night for Vendors and
BBQ @ PMC Detroit

Thank you to our sponsors...

A special thank you to the following manufacturers' representatives for sponsoring this month's meeting. Let them know you saw their names here.

Alec Bien
Quality Water & Air

Cindy Zatto
V.E. Sales

Mark your calendars for October 28 for Domestic Water Distribution, Boosters, Treatment and Sizing



October



S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

ASPE News is published 10 times per year (September through May, plus one summer issue). Yearly advertising rates are \$250.00 per ad for members and \$300.00 for non-members. Insert advertisements are \$250.00 per newsletter for one oz., \$100 for every oz. over. Help Wanted ads, fifty words or less, \$100.00 per issue. For quarter-page and half-page product ads, please contact Joe Hernandez. Checks should be made payable to ASPE E. Mich. Chapter and send check with inserts or ad to Joe Hernandez. Circulation 400-Distributed to: Engineers, Contractors, Inspectors, and other industry professionals in Michigan. For contributing articles contact Joe Hernandez, Newsletter Editor at newslettereditor@aspeemc.org.

VP TECH REPORT

Jill J. Dirksen
VP Technical

I hope to find everyone enjoyed their summer with vacations, long sunny days, and friends & family. Thank you for giving me the opportunity to lead this year's technical classes. It is going to be challenging yet very rewarding at the same time. There is plenty to learn and it is my intent to get as much information to our members as possible. From the individual studying for the CPD to the person that has been in the industry for forty years, this year's class sessions are geared to enhance all levels of knowledge. Class sessions will include equations, references to code, relevant materials, drawings, problems to be solved, and discussions just to name a few. Along with our regular monthly chapter meetings, we will be offering a couple of breakout sessions that compliment and dive deeper into the session that was covered at the chapter meeting. These sessions will be held on selected Saturdays at a minimal cost to each ASPE member.

The summer planning meeting was a great session setting the schedule for the upcoming year as well as learning from each other during the exchange of ideas. It is exciting to see the wealth of knowledge our chapter members have and how much that can get done when you gather brains together. I am looking forward to experiencing the dialogue that will take place at each meeting. Eastern Michigan is well on the way to a great new year with an exciting line-up of topics to be covered with respect to hotel systems design and then some!

For each technical session, I want to let all of you know it will be a full session of learning. So, please bring a pen/pencil and paper, calculator, possibly a code book (if you have one), and all of your questions for that particular topic to be covered! Be on the look out for assignments from meeting to meeting!!! We know that many of you are studying for the CPD exam and hope that each and every one of you walk out of the technical sessions with more tools in your tool box to take the exam.

Something else that we will be doing this year is getting to know each other through the class sessions. Learning together is an important way to build communication skills, comprehend ideas through different perspectives, and tap into a wealth of knowledge that our chapter has. Smaller group sessions at the meetings will allow interaction of the membership to ask questions, design together and find answers for questions that each speaker will ask. The smaller group sessions will be initiated at the time during a presentation that the speaker feels most appropriate. Each group should have a diverse group to represent the industry. These sessions will be no more than 5 to 10 minutes or, if the speaker chooses to have a longer time.

So, let's get back to the basics! This year we are getting back to designing, coordinating, and learning what needs to happen and what does happen to get a building built smoothly and properly. To begin the year, at our September meeting, the topic will be Sanitary and Storm Piping. None other than our Ron George has graciously accepted to present the first session to set the groundwork for the year and our building.

Coordinating sanitary and storm piping outside of the building is only the crack in the foundation for these systems and their underground nature. There are many other items to consider. What are these you ask? Well, for starters elevation. Many times, the depth of the building or utilities restricts the systems from flowing naturally. Thus, we must rely on forced flow to get the system to work correctly. Before getting to that point, volume is a must. Questions pertaining to building usage and location help to determine this value. Architecture and Structure must also be considered during layout and design of sanitary and storm systems. To find out much, much more, you will have to come to the technical session on September 23, 2003 and listen to Ron.

Please let me know if you plan on attending. I may be e-mailed at Jill.Dirksen@akahn.com or fax me at (313) 202-7388. This will help out tremendously with the preparations for dinner. If we do not have a reservation in place, there will be a small fee. This is due to the food that gets wasted when attendance is unable to be determined. We don't want to run out of food for anyone either! So, please make sure to confirm with me you will be there. I look forward to the first meeting and seeing all of you there!!!!

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VP LEGISLATIVE

Ron George, CIPE/CPD

I would like to thank you for supporting me to be your VP Legislative. I have just returned from a trip to Alaska where I was the speaker for two days at the Alaska Mechanical Contractors Association Conference in Anchorage. I brought my family and after the conference was over, we rented a motor home and toured Alaska for 7 days. It was a trip of a lifetime. What a beautiful place!

OK, on to the legislative stuff. July and August were busy months for the code development arena. Last Spring the Code Study & Development Committee of S.E. Michigan met at the Plumbing Heating Industry building to propose new code language and submit proposed code changes for the International Plumbing Code (IPC). This summer the committee met twice to review and discuss all of the proposed code changes that were published in the International Code Council's (ICC) proposed code change monograph. The committee is comprised of over 20 individuals representing a consensus or cross-section of the industry. A few representatives from this committee will travel to the code hearings in early September to testify for the proposed code changes they submitted and to provide testimony for other code changes that were reviewed by the committee.

I am honored to have been selected by the International Code Council as one of the committee members to sit on the International Plumbing Code Committee representing plumbing design professionals. I am looking forward to serving on the committee and attending the code change hearings as one of the voting committee members. The Code Hearings are in Nashville, Tennessee Sept. 5 - 8.

Last year at the IPC Hearings, I proposed over a dozen code changes and many of them dealt with hot water temperatures, HW terminology, thermostatic mixing valves and scalding issues. There were dozens of code changes submitted by others and many of these items seemed to be foreign to some of the code committee members and many of the code changes were denied because it seemed some committee members seemed to be unfamiliar with some of the issues and research reports that were referenced in the supporting material for the code changes. A couple of the code changes were basically codifying what ASPE recommends in the ASPE Research report on Hot water storage and utilization temperatures. ASPE recommends storing hot water above 135 degrees Fahrenheit to limit Legionella bacteria growth and using a thermostatic mixing valve to mix it down to a safe delivery temperature (maximum of 120 degrees) for distribution.

After the code hearings last year in Pittsburgh, Dave Viola of the Plumbing Manufacturers Institute addressed the assembly and said ICC should form an Ad Hoc Committee to study these issues because they are important and the committee could provide a report with their findings for the next code hearings.

Recently, I learned I was selected as one of the members of the International Code Council's Ad Hoc Committee on "Temperature Limits in Domestic Hot Water Systems". The committee met in Las Vegas on August 12, 2003 and reviewed most of the proposed changes dealing with hot water for the 2003/2004 code cycle. They will have the chairman of the committee report on the Ad Hoc Committee's position on most of the code changes dealing with Hot Water at the International Code Hearings in Nashville September 5th through the 8th.

The ICC Ad Hoc committee on HW also developed a matrix of fixtures that use HW and standards that could apply to these fixtures. The matrix is a first draft and should lead to proposed code changes for next years code hearings. A copy of this matrix will available at our upcoming September meeting as space constraints did not allow it to be included in the newsletter.

The ICC Ad Hoc committee on HW attempted to address several issues that dealt with system design issues and seemed to bog down in discussion. I gave the committee a brief report on the status of ASPE's design standard committees and mentioned the ASPE HW design standard committee will be meeting soon to address most of the issues raised in the near future. In the interest of time, they agreed to leave the HW system design issues to the new ASPE HW design standard committee.



Spotlight on our Members

Long time ASPE member and current board member, Ron George, has started his own design and consulting company, Ron George Design & Consulting Services. His company offers design services for plumbing, piping, fire protection and HVAC design. It also provides forensic investigations and code consulting for litigation support.

Good luck to Ron in his new endeavor!

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Professor Plumber sez...

**Bill Grayzar, CPD
VP Education**

As V.P. of Education, it is my intent to aid those interested in preparation for the April 24th, CPD exam. I will review various test taking skills, formulas and calculations throughout the coming year in this newsletter. There will also be a Saturday CPD review course tentatively scheduled for April 3, 2004. If you have any questions, comments or suggestions, please feel free to bring them my attention and I will do my best to address them. Your feedback is important to the entire ASPE Board as we are always looking for ways to improve our chapter and its services to our members.

The topic for the September ASPE meeting is Sanitary and Storm Layout, Design and Sizing. In keeping with this month's topic I would like to address uniform flow in sanitary and storm drainage systems.

Uniform Flow:

When flow occurs in drainage piping, the water level does not fill the pipe under normal conditions. If the water were to flow filling the pipe, full pressure fluctuations would occur that could siphon the seals of traps within the building. Gravity flow in sloping drain lines of a plumbing system is similar to the flow of water in open channels. The flow is not pressure dependent but flows by gravitational force induced by the slope of the drain and height of the water in that drain.

"Uniform flow" is that flow that is achieved in an open channel of constant shape and size and uniform slope. When calculating the velocity of uniform flow in sloping drains, the most widely utilized formula is the "Manning Formula".

Manning Formula: $V = 1.486/n \times R^{2/3} \times S^{1/2}$

Where **(V)** is the velocity of flow in feet per second (fps), **(n)** is a coefficient representing the roughness of the pipe surface, degree of fouling and pipe diameter, **(R)** is the hydraulic radius in feet (ft), and **(S)** is hydraulic slope of surface of flow in ft/ft.

Roughness of pipe **(n)** is a constant value determined by pipe material and size. There are many tables

available when determining the roughness of pipe. Recommended values for **(n)** for use in the design of plumbing sanitary drains are 0.012 for 1½" pipe, 0.013 for 2 and 3" pipe, 0.014 for 4" pipe, 0.015 for 5 and 6" pipe and 0.016 for 8" pipe and larger. A value of 0.0145 can be safely employed for all sizes of storm drainage pipe.

Slope of pipe **(S)** is determined by dividing the rise of pipe by the run. An example for 1/8" per foot slope, the pipe is pitched 1/8" per foot for every 12" of run. Both values must first be converted to feet resulting in 0.0104 ft and 1 ft. Thus $S = 0.014 \text{ ft./1 ft} = 0.0104 \text{ ft/ft}$.

To determine the Hydraulic Radius **(R)** of pipe the following equation is utilized:

Hydraulic Radius (R): $R = \text{Area of Flow} / \text{Wetted Perimeter}$

Area of flow is determined by utilizing πr^2 (or $\pi D^2/4$) the area of a circle and is based on pipe size in feet and how full the pipe is with water. To find the area of flow and the wetted perimeter of a pipe typically a condition of the pipe at half-flow is utilized (refer to the diagram below). This means the pipe will be flowing half full of water and half full of air. So utilizing the area of a circle as πr^2 and figuring the pipe half-full of water, the area of flow can be determined by calculating the area of the pipe and dividing by a factor of 2. Therefore the area of flow of a circular pipe is equal to $\pi r^2/2$.

To determine the wetted perimeter of a pipe we can use the formula for circumference of a circle $2\pi r$. Figuring once again the pipe half-full, the wetted perimeter is equal to half the perimeter of the pipe or $2\pi r/2$, which yields πr as the wetted perimeter.

Thus, the Hydraulic Radius **(R)** can be determined by the equation above using $\pi r^2/2$ for the area of flow and πr for the wetted perimeter, which yields $r/2$ (or $D/4$) as the hydraulic radius.

As an example to determine velocity of flow of water in 4" sanitary drainpipe sloped at 1/8" per foot, we must first determine the roughness of pipe **(n)** to be 0.014. Next the slope of the pipe **(S)** is calculated as above and would be 0.0104 ft/ft.

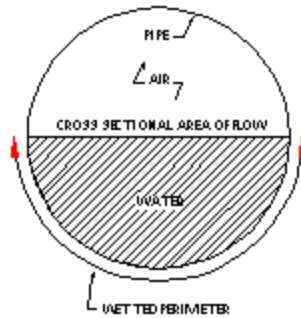
The Hydraulic Radius **(R)** is calculated as $r/2$ (remember r = radius and must be in units of feet). The radius of a 4" sanitary pipe is equal to 0.1666 ft. Thus, $0.16666\text{ft}/2$ yields a value of 0.8333 ft. for the Hydraulic Radius.

Professor Plumber sez...

continued from previous page.

Using the derived values with the Manning Formula the velocity of flow in a 4" pipe sloped at 1/8" per foot is derived as follows:

$$V = 1.486/n \times R^{2/3} \times S^{1/2} = 1.486/(0.014) \times (0.0833\text{ft})^{2/3} \times (0.0104 \text{ft/ft})^{1/2} = 2.065 \text{ fps}$$



To determine the Quantity Rate of Flow (**Q**) in cubic feet per second (cfs) we include the cross sectional area of flow (**A**) with the Manning Formula. This gives the following equation:

$$\text{Quantity Rate of Flow: } Q = AV = A \times 1.486/n \times R^{2/3} \times S^{1/2}$$

Cross sectional area is the surface area of the water in the pipe (refer to the diagram above). Once (**Q**) has been derived it can be converted to gallons per

minute (gpm) by first converting cubic feet (cf) to gallons (gal) by multiplying (**Q**) \times 7.48 gal. Next seconds are converted to minutes by dividing (**Q**) / 60 sec. This will yield a new value for (**Q**) in terms of gpm.

It is important to always convert all values to the proper units whenever utilizing any formula. Some of the common conversion factors you will need and should know for the CPD exam are listed below. You should be able to pull these conversions from memory prior to the exam.

*1 gallon of water weighs 8.33 pounds (1 gal = 8.33 lbs)
1 cubic foot will hold 7.48 gallons of water (1 cf = 7.48 gal)
1 cubic foot of water weighs 62.4 lbs (1 cf = 62.4 lbs)
1 pound per square inch of pressure creates 2.31 feet of head pressure (1 psi = 2.31 ft of head)
1 foot of head pressure creates .433 pounds per square inch of pressure (1 ft of head = .433 psi)*

If you would like further review material look in the June 2003 issue of Plumbing Engineer for a great article by Timothy Allinson P.E. on Bernoulli's Equation for the fluid exchange of kinetic energy for pressure. Also please note the clarification to this article on page 18 in the August issue of Plumbing Engineer

Look for more calculations in the October ASPE newsletter.

President's Report

continued from pg. 1

Christmas gift and help out the chapter treasury as well. The same type auction, with different items will be held throughout the second half of the technical season and will end on May 25, 2004 with a BBQ and open mic night for all vendors. The silent auction money will be used to help finance a couple or more, (depending on your own generosity) of our members to the ASPE Convention in Cleveland, Ohio during October of 2005.

As President, I must be more involved in the day-to-day operations of each position of our Board of Directors. Our Board represents diversity throughout the plumbing industry and works very hard for your behalf. I want to thank them all for their hard work and time that has been required to put this season together, and we're only beginning.

The Eastern Michigan Chapter membership is staying fairly even at about 180 people. We hope to increase our membership through code inspectors, contractors and of course, engineers... yea, all you know-it-all types, we want your opinion too. You give them freely at work everyday, why not continue the banter at our meetings?

Our Chapter treasury is healthy, but by no means are we as

well off as Chicago, Los Angeles or other chapters in our own region. We must spend wisely like most of our households and maintain that type of fiscal attitude.

Eastern Michigan Chapter of ASPE will be very well represented for our state Code Hearings coming up in September with John Matthews, John Nussbaum, and our Vice President Legislative, Ron George in attendance representing different factions of the industry, but with one voice from our ASPE Chapter. Incidentally, we have been very instrumental in past code hearings in getting legislature passed into code verbiage.

Finally and unfortunately, I will not be in attendance for our first meeting due to a conflict with an out of town, Mid-West Regional meeting for Viega. At this point I cannot elaborate on this meeting, but I will at the appropriate time.

For now, I'll see some of you sooner than others, but not by choice. I'll miss the first meeting and hoping that all goes off as planned.

Oh, remember that you must RSVP or you'll be charged \$10 at the door to cover your food order. It's free if you RSVP by the Friday prior to the Tuesday meeting. No exceptions. You must make the attempt to be accountable and keep your appointments. We will keep attendance when you leave the meeting!

Eastern Michigan



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chapter - get involved!*

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knightsales@prodigy.net

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High Efficiency Water Heaters and Boilers
45900 Port Street
Plymouth, MI 48170
Jason Loverich
Ph 734 454-4480 Fax 734 454-1790
jloverich@lochinvar.com
www.lochinvar.com

Lozuaway & Associates, Inc.

Manufacturers' Representatives
1160 W Hill Road
Flint, MI 48507
Mike Ostrowski
Wayne Phillpotts
Ph 810 234-1635 Fax 810 234-8389
lozuaway@lozuaway.com

Meek / Beck & Associates, Inc.

Manufacturers' Representatives
11875 Belden Court
Livonia, MI 48150
Ross Beck
Ph 734 458-2950 Fax 734 458-2953
meekandbeck@aol.com
www.meekbeck.com

ITT A-C-centrifugal, split case, end suction, self-primers, **American Marsh**-horizontal & vertical centrifugal, multi stage, **Floway**-vertical turbine pumps, API 610, **Grundfos**-multi-stage stainless steel pumps, in-line, end suction, sump pumps, **ITT Flygt**-submersible pumps & mixers, **Union**-in-line & high pressure pumps, **Vican**-rotary gear pumps, **Cascade**-mixed flow & propeller pumps, **Griswold**-ANSI, centrifugal, submersible turbines, **Carter**-plunger pumps, **Patterson**-centrifugal, horizontal & vertical, **Metropolitan**-pump control system, variable speed pump pkgs & heat transfer pkgs, **Pump/Con**-level control equipment, **Phonetics**-alarm dialers, **Multirode**-level monitoring & control systems, **Desurik**-plug, butterfly, knife gate, V-port & control valves, pneumatic double acting, spring return & diaphragm actuators, **In-line**-stainless steel ball valves, **Claval**-automatic control valves, backflow preventers, float valves, **Crispin Valve**-rubber flapper check & air release valves, **Hydro Gate**-slide & sluice gates, **Crane**-mission-double & single door check valves, **RCS**-electric, on-off modulating & fail-safe quarter-turn & multi-turn, **Kinetrol**-quarter-turn "vane" type pneumatic actuators, **Thermon**-heat tracing specialist, self-regulating & power limiting, constant watt, electric & steam tank heating, heat transfer cements, controls & monitoring, **Cellex**-heated instrument enclosures, pre-insulated tubing, instrument supports, **Adamson**-shell & tube, heat exchangers, packaged water heaters, **Adamson**-storage, hydro-pneumatic, expansion, boiler blowoff tanks, **Topp**-fiberglass basins, **Hilliard Corp.** "Filco"-oil filters, oil reclaimers, **Proco**-flexible connectors, **Shaw Piping Engineering & Hanger Group**-design, engineering & fabrication of insulated & non-insulated pipe support systems for all piping from -425F to +1800F, **Thunderline**-link seals & wall sleeves, **Cook Legacy**-coatings to prevent Zebra Mussel build up, **Magnadrive**-magnetic couplings/VFD's, **Baysaver**-stormwater separation

Powers Process Controls - pressure equalizing & thermostatic blending valves, fotopanel, hydropanel, electronic plumbing, self-actuated temperature regulators, pneumatic temperature controllers, **Haws Drinking Faucet Company** - emergency showers & eye wash fountains, drinking fountains & water coolers, **Coyne-Delany** - flush valves, sensor plumbing, **J.D. Gould** - electric solenoid valves, bronze & stainless steel

Lochinvar - High efficiency water heaters, boilers, pool heaters, booster heaters & storage tanks.

A.O. Smith - water heaters, boilers, commercial & residential, **American Plumber**-water filtration products, **Bemis/Church** - plastic, wood and medic-aid, residential & commercial toilet seats, **Boetz Plumbingware**-steel lavs & tubs, **Howell Metal**-copper tubing, **Jones Stephens Corp.**-plumbing specialties, **Little Giant Pump Co.** -sump, sewage & condensate, **Mansfield Plumbing**-plumbing products, china/steel/brass, **Plastic Trends** - PVC SDR 35 gasketed 4"-24", PVC SDR26 heavy wall gasketed 4"-18", PVC SDR 35 solvent weld 4"-24", styrene solvent weld 3"-6", PVC/DWV solvent weld 8"-24", **Plumco** -specialty products, **Royal Quickstop**-fire protection systems, **Swirl-way**-acrylic whirl-pool tubs, Vandem-no hub cast iron soil pipe and fittings

Aero Mfg.-stainless steel sinks, **Bradley Corp.** - washfountains, emergency, patient care & security fixtures, **Central Brass**-faucets & plumbing brass, **Chronomite** - point of use water heaters, **Dwyer Kitchens** - compact kitchens, **Halsey Taylor** - electric water coolers & drinking fountains, **Leonard** - shower & water mixing valves, thermostatic & pressure balanced, **McGuire**-brass fittings, **Santana** - toilet & shower compartments, **Truebro** - trap & supply covers

Merlo Steam Equipment Co., Inc.

Manufactures' Representatives
35745 Beattie Dr.
Sterling Heights, MI 48312
Gregory J. Merlo
Ph 586 978-8434 Fax 586 978-8459
gregm@merlosteam.com
www.merlosteam.com

Nibco Inc.

1516 Middlebury Street
Elkhart, IN 46516-4740
Dane P. Badgero
Ph 800 234-0227 Fax 219 295 3307
badgerod@nibco.com
www.nibco.com

Performance Engineering Group

Engineered Water Products
32955 Industrial Rd.
Livonia, MI 48150
Alan Deal
Ph 734 266-5300 Fax 734 266-5310
www.performanceengineering.com

Quality Water & Air, Inc.

Manufactures' Representative
1402 Souter
Troy, MI 48083
Alec Bien
Ph 248 589-8010 Fax 248 589-8016
qualitywaterair@hotmail.com

R.L. Deppmann Co.

Southfield * Grand Rapids * Saginaw
Southfield Office: P.O. Box 5023
20929 Bridge St
Southfield, MI 48086-5023
Mary Anderson
Ph 248 354-3710 Fax 248 354-3763

Armstrong International-“Flo-Rite Temp” & “Flo-Direct” instantaneous water heaters, thermostatic mixing valves, air vents, drainers, radiator valves, pressure reducing valves, heating & cooling coils, hose stations, steam traps, steam specialties, condensate pumps, steam system optimization services, **Humidifiers**-water spray-fogging types, steam-electronic & gas fired, steam to steam, **Check-All Valve**-specialty spring-loaded check valves, **Circle S Products**-steam & air separators, flash tanks, **Crane Environmental**-deaerators, high purity water systems, membrane-based filtration, reverse osmosis (RO), softeners & filters, **Hydro-Thermal**-direct injection steam heaters, **Kumkle**-safety & relief valves, **Lattner Mfg.**-gas/electric steam & hot water boilers, **Marlo Coil**-heating & cooling coils, **Sentry Equipment Co.**-plate & frame, brazed heat exchangers, **Valleygroup**-ceramic insulation & corrosion protection

Nibco - copper & plastic fittings, plumbing valves, pressure rated valves, industrial plastic fittings & valves

Allrich-steel tube, oil & gas-fired boilers. Low pressure steam, hydronic and volume hot water heating systems, **Autotrol**-water purification by deionization. Capacities up to 20,000 gallons per day, **Hobby Valve Co.**-low/standard range thermostatic mixing valves 1/2" to 4", **Lawler Valve Co.**-low/standard range thermostatic hot water mixing valves, emergency shower valves, temperature and pressure balanced mixing valves 1/2" to 2", **Rappale**-copper-fin hydronic and domestic hot water supply boilers, booster heaters & storage tanks. Sizes from 30 MBTU to 4,000 MBTU, **Rund Manufacturing**-commercial & residential gas-fired and electric hot water heaters & booster heaters, **Tlaw-Palco**-cutom in-slab & underfloor heating designs & materials for radiant floor heating, snow melting and de-icing systems, **Valley**-commercial water softeners with metered & non-metered regeneration control, pre-wired and pre-plumbed multi-tank systems

ABS Pumps-sump & sewage pumps & systems, **American Water Heater** -commercial tank type water heaters, **Conbraco**-plumbing & heating products, backflow prevention devices, **DWV Foundry**-cast iron soil pipe, fittings, full port valves, **Ecodyne**-commercial and industrial water treatment, R.O. systems, D.I. water PVC drains & cleanouts, **Everhot**-stone lined indirect water heaters, **Flo-Pak/Patterson Pump**-pressure booster systems, package HVAC pumping systems, fire pump systems, **Genova/J.M./Jet Streams**-Sch 40 PVC, solid & cellular core, Sch 30, SDR 26 & 21, gasketed & belled end, CPVC & sewer pipe, **Graham**-plate & frame heat exchangers, steam instantaneous water heaters, **Griffin Products**-stainless steel sinks & fixtures, **H.B. Smith**-commercial cast iron steam & hot water boilers, **Hydrotherm**-commercial & residential cast iron modular & pipe boilers, **John Wood Co.**-ASME & commercial pressure vessels, storage & expansion tanks, **Lasco**-PVC fittings, sch 40 & sch. 80, **Maxitrol**-gas pressure regulators, **Mepco**-steam specialties, condensate & vacuum pumps, traps, **Mifab**-roof & floor drains, cleanouts, carriers, interceptors, access doors, trap primers, hydrants, **Polycast**-trench drain systems in precast polymer concrete or fiberglass, **RBI**-commercial & residential copper-fin boilers & water heaters, storage tanks, pool heaters, **Rehau**-radiant floor hydronic heating & snow melt systems, plumb-pep, **Space Pak**-air conditioning systems, **Thermex**-point of use electric water heaters, **Thrush**-circulator pumps, inline pumps, end suction pumps, heat exchangers, hydronic accessories, **Weinman Pump** -base mounted, horizontal split case, turbine, condensate systems, **Wheatley**-pump accessories, heat exchangers, expansion tanks, air separators, CBV, TDV, strainers & valves, flexible connectors

A.C.Tech-variable speed drives, **Advance Thermal**-removable insulation & acoustical covers, **ITT Bell & Gossett**-hydronic specialties, centrifugal pumps, heat exchangers, heat transfer plugs, pressure booster, domestic water heating, variable speed systems, vertical turbine, submersible pumps, **Cemline**-ASME tanks, hot water storage, packaged water heaters, stone steel lined tanks, replacement tube bundles, unfired steam generators, **ITT Domestic Pump**-condensate return, vacuum & pressure powered pumps, boiler feed systems, **Dow Heat Transfer Fluids** -Dow Therm SR-1, Dow Frost, **Dri-Steam**-steam injection, gas to steam, steam to steam, electric steam, evaporative humidifiers, ultrasonic fog humidifiers, **Crisvold Controls**-coil hook-up kits, constant flow limiting valves, filter, solids separators & filter systems, **Highland Tank**-oil & water separators, **ITT Hoffman Specialties** -steam traps & specialties, condensate return pumps, pressure regulating valves, **ITT McDonnell & Miller**-boiler safety controls, level controls, flow switches, **Metraflex**-flexible pump connectors, expansion joints & guides, non-slam check valves, ball & butterfly valves, **MP Pumps**-self priming pumps, engine driven pumps, **Peterson Equipment** -“Petes” pressure/temperature test plugs, **Preso**-annular/venturi flow meters, **Vertifo**-pedestal mount sump pumps, **Vibration Eliminator**-vibration control bases, spring isolators, **Watts Radiant**-radiant floor heating systems, snow melting systems, **Welsler Instruments**-pressure gauges, thermometers, recorders **Wessels**-ASME storage tanks, bladder tanks, glass lined storage tanks, glycol fill systems

Sales Service Plus, Inc.

Manufacturers' Representatives
45606 Mast St.
Plymouth, MI 48170
Kirby J. Meagher
Ph 734 454-7620 Fax 734 454-7632
kmeagher@salesserviceplus.com
www.salesserviceplus.com

The Taggart Company, Inc.

Manufacturers' Representatives
32985 Hamilton Court, Suite 102
Farmington Hills, MI 48334
Gary O. Taggart
Ph 248 553-4388 Fax 248 553-4653
www.taggartco.com

TRO Sales Company

Manufacturers' Representatives
3406 West 12 Mile Road
Berkley, MI 48072
Thomas R. Osberger
Ph 248 546-5354 Fax 248 546-3513
trosalesco@aol.com

Underwood Fire Equipment Inc.

Fire Equipment Sales, Service, Repair & Testing
P.O. Box 43
Novi, MI 48376
Darrell W. Underwood
Ph 248 347-4975 Fax 248 347-0843
info@underwoodfire.com
www.underwoodfire.com

V.E. Sales Co., Inc.

Manufacturers' Representatives
25200 Jefferson Avenue
St. Clair Shores, MI 48081-2347
Cynthia Zatto
Ph 586 774-7760 Fax 586 774-1490
cell 810-343-2713
cindy@vesalesinc.com
www.vesalesinc.com

Dave Watson Associates, Inc

Manufacturers' Representatives
1325 W. Beecher St.
Adrian, MI 49221
Dave Watson, Jr.
Ph 517 263-8988 Fax 517 263-2328
watsonassoc@tc3net.com

Alsons-shower heads, hands showers & accessories, **Campbell Mfg.**-water system & filtration products, **CTS**-copper flange adapters, **Flint & Walling**-well pumps, jet pumps, water conditioning, **Laco Industries**-fluxes, sealants, penetrants, caulk, putty, **PHD Mfg.**-pipe hangers, strut & accessories, **Raychem**-heat tracing products, pipe freeze protection, **Seminole**-pipe nipples, couplings, steel fittings, **Stadler-Viega** - in-floor radiant heat, potable water pex, **Topp Industries**-fiberglass and poly basins, **Viessmann Mfg.**-boilers, controls & energy management, **Ward Mfg.**-malleable & cast iron fittings, wardflex, **Waterless**-waterless urinals, **Zoeller Pump Co.**-sump, sewage & wastewater pumps & accessories

Anaco-no hub couplings, transition couplings, SV gaskets, **Aquarius** - acrylic & gel coat shower/tub-shower surrounds, **Chicago Faucet**-residential, hospital, industrial, commercial, lab & decorative faucets, **Eemax**-electric tankless water heaters, **Geberit**-commercial product division, sensor flush valves & faucets, pressure assisted toilet systems, metering faucets, **Guardian Equipment**-emergency eye wash & shower equipment, **Husky** - heavy duty & mid-range no hub couplings, **Intersan Mfg.**-stainless steel and polyresin washfountains, **Orion Fittings**-corrosion resistant piping systems, high purity water & dilution tanks, **Stern-Williams Co.**-terrazzo mop sinks & shower floors, drinking fountains, **Tyler Pipe**-Tyler soil pipe & accessories, Rufwall systems

Aqua Bath-acrylic ADA tub & shower unit, **Cooper Blinn**-pipe hangers & strut systems, **Dupage Products**-threaded rod & hose clamps, **Green Mfg. Inc.**-loading racks & stairs, **Hayward Industrial Products**-plastic pvc, cpvc valves, basket strainers, filters, pneumatic & electric actuators & solenoid valves, **Webster Pumps** -inmersible & centrifugal pumps, **Insul-Tele**-insulated piping systems, **Homestead**-plug valves, **Hydrotek International Inc.**-sensor operated faucets & flush valves, **Mission Rubber Co.**-"heavyweight" no hub couplings, **Noble Co.**-anti-freeze non-toxic, CHE shower pan lining, **Richmade Co.**-pvc shower pan lining, **Rockford Sanitary Systems**-grease interceptors, oil separators, **OPW Engineered Systems**-loading arms, sight flos, iso rings & swivel joints

AC Fire Pump Systems - horizontal split case, end suction & in-line fire pumps, ul & fm packaged systems including skids & pre-fabricated houses, **Floway Pumps** - vertical turbine fire pumps, **Cla-Val** - fire control valves, ul & fm, **Guardian** - Guardian fire equipment, hose equipment and brass, **Xerxes** - underground water storage tanks, **Modern** - pressure & steel water storage tanks.
Field service work for all manufacturers of pumps, controls and accessories.
Annual fire pump tests and preventative maintenance.

Apollo - ball valves, butterfly valves, pneumatic & electric actuators, mixing valves, pipeline strainers, **Colonial**-PCV/CPVC/PVDF/PP ball valves, PVC butterfly valves, PVC/CPVC unions and PVC/CPVC strainers, **Conbraco**-backflow preventers, safety relief valves, check valves, plumbing and heating products, **IPS**-plastic pipe cement, primers and cleaners, test plugs, **Josam**-roof & floor drains, cleanouts, carriers, grease traps, oil interceptors, trench drains, Blucher SS drainage system, **Lasco**-Sch 40 & Sch 80 PVC & CPVC and PVC DWW fittings, **Murray**-hose clamps, **Oil Creels**-polyethylene piping systems, **RP&C Valve**-800 & 1500 class forged steel gate, globe & check valves, 1690 & 2690 class y-pattern globe & check valves, needle valves, boiler blowdown valves, **Safe-T-Cover**-freeze & vandal protective enclosures for backflow preventers, **Shaw Valve**-150 & 300 class high performance butterfly valves, **Sloan Flushmate**-pressure assist flushometer tanks, **Speelman**-emergency eye wash & showers, mixing valves, sensor faucets, metering faucets, lav faucets, shower heads, pressure balanced shower valves, **Sunroc**-water coolers & fountains, **Techno**-check valves-wafer, swing, elastomer hinged, plastic & metal construction, **Watson McDaniel**-steam traps, regulators, pressure motive pumps, steam separators, exhaust heads, clean steam products

Watts Regulator Co. -regulators, control valves, relief valves, backflow preventers, ball valves, gate valves, butterfly valves, hydronic valves, tempering valves and other plumbing specialties

ASPE NEWS

American Society of Plumbing Engineers-Eastern Michigan Chapter

Joe Hernandez, Newsletter Editor

P.O. Box 37317
Oak Park, MI 48237

Internet Address

<http://www.aspeemc.org>

e-mail address

info@aspeemc.org

Non-Profit Corporation

**Local Chapters Not Authorized To Speak
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First Class Mail

2003-2004 ASPE Officers and Committee Chairpersons

President

Doug Cryer, CSI, CIPE/CPD
Viega Pro-Press
3600 Academy
Dearborn, MI 48124
313 406-2693 Fax 313 406-2959
doug.cryer@viega.com

Vice-President Membership

Ross Beck
Meek/Beck & Associates, Inc.
11875 Belden Court
Livonia, MI 48150
734 458-2950 Fax 734 458-2953
meekeandbeck@aol.com

Treasurer

Brett Young
Burke Agency, Inc.
2605-A Oakley Park Rd.
Walled Lake, MI 48390
248 669-2800 Fax 248 669-3310
byoung@burkeagency.com

Affiliate Liaison

Larry Keelan
Larry Keelan & Associates, Inc.
313 885-8690 Fax 313 885-8710
larrykeelan@comcast.net

ASPE Night at the Races Chairman

Scott Knight
Knight Sales, Inc.
313 534-9800 Fax 313-534-3030
knight-sales@prodigy.net

Vice-President Technical

Jill Dirksen
Albert Kahn Assoc., Inc.
7430 2nd Ave.
Detroit, MI 48202
313 202-7888 Fax 313 202-7388
jill.dirksen@akahn.com

Vice-President Education

William Grayzar, CPD
DiClemente Siegel Design, Inc.
28105 Greenfield Rd.
Southfield, MI 48076
248 569-1430
bill@dsonline.com

Corresponding Secretary

George Johnston
Balfrey & Johnston, Inc.
P.O. Box 37317
Oak Park, MI 48237
313 864-2800 313 864-7219 Fax
george@balfrey-johnston.com

Newsletter Editor/Awards/Elections

Joe Hernandez, CIPE/CPD
S.S.O.E., Inc.
1050 Wilshire Blvd. Ste. 260
Troy, MI 48064
248 643-6222 Fax 248 642-6225
jvhernandez@ssoe.com

Vice-President Legislative

Ronald George, CIPE/CPD
Ron George Design & Consultin
6275 Masserant Rd.
Newport, MI 48166
734 586-2040 Cell Ph 734 755-1908

Administrative Secretary

John Nussbaum, FASSE IPP
PHCC of S.E. Michigan
14801 W. Eight Mile Road
Detroit, MI 48235
313 345-3535 Fax 313 341-1007
jnussbaum@pmcdetroit.org

Hospitality

Cindy Zatto
V. E. Sales Company, Inc.
25200 Jefferson Ave.
St. Clair Shores, MI 48081
586 774-7760 Fax 586 774-1490
cindy@vesalesinc.com

Toronto Chapter Satellite Chapter Chairman

Peter Ashton
MIFAB
277 Humberline Dr.
Etobicoke, Ontario CA M9W5J6
pashton@mifab.com