

VIRGINIA PLUMBING AND MECHANICAL INSPECTORS ASSOCIATION

# VP MIA

**AT VIRGINIA BEACH**

April 3<sup>rd</sup> - April 5<sup>th</sup>, 2019



## 56<sup>th</sup> Annual School of Instruction

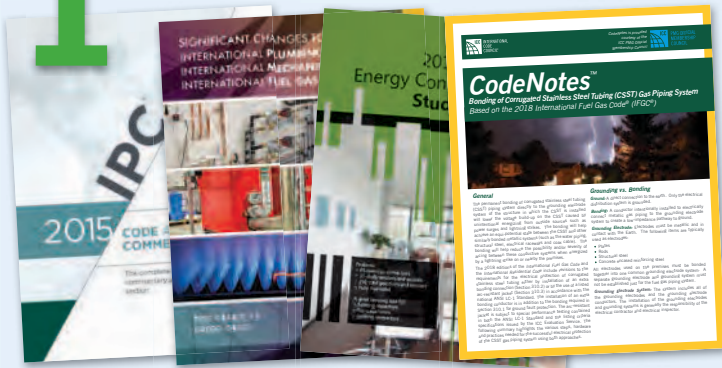


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## Welcome to the 56<sup>th</sup> VPMIA School of Instruction



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**April 3-5, 2019** **The Holiday Inn & Suites Virginia Beach - North Beach**  
3900 Atlantic Ave, Virginia Beach, VA 23451 PH: 757.428.1711

**WEDNESDAY, APRIL 3<sup>RD</sup>**

**7:00 - 8:15 a.m. Registration**

**8:30 - 10:00 a.m. VRF Concept and Applications** — Robert Powell, DAIKIN  
(Mechanical 1.5 CEU)

**10:00 - 10:30 a.m. Break**

**10:30 - Noon Codes and Standards as it applies to VRF** — Robert Powell, DAIKIN  
(Mechanical 1.5 CEU)

**Noon - 1:00 p.m. Lunch** *(included with registration)*

**1:00 - 2:30 p.m. Air Ducts and Plenums** — John Taecker, UL  
(Mechanical 1.5 CEU)

**2:30 - 3:00 p.m. Break**

**3:00 - 4:30 p.m. Flammable Refrigerants** — John Taecker, UL  
(Mechanical 1.5 CEU)

**5:45 - 6:00 p.m. Presidents Welcome**

**6:00 - 7:30 p.m. Dinner** *(included with registration)*

**THURSDAY, APRIL 4<sup>TH</sup>**

**8:00 - 10:00 a.m. 2015 Significant Changes IPC, IMC, IFGC** — Guy Tomberlin, ICC  
(Plumbing 2.5 CEU, Mechanical 2.5 CEU, Fuel Gas 1 CEU, 6-hour class)

**10:00 - 10:30 a.m. Break**

**10:30 - Noon 2015 Significant Changes IPC, IMC, IFGC, ICC Training, cont'd.**

**Noon - 12:15 p.m. VPMIA General Membership Meeting Part I**

**Noon - 1:00 p.m. Lunch** *(included with registration)*

**1:00 - 2:30 p.m. 2015 Significant Changes IPC, IMC, IFGC, ICC Training, cont'd.**

**2:30 - 3:00 p.m. Break**

**3:00 - 4:30 p.m. 2015 Significant Changes IPC, IMC, IFGC, ICC Training, cont'd.**

**5:00 - 6:00 p.m. Reception**

**6:00 - 8:30 p.m. Banquet: Dinner/Awards/Installation of Officers**  
*(included with registration)*

**FRIDAY, APRIL 5<sup>TH</sup>**

**8:00 - 9:00 a.m. Breakfast Buffet** *(included with registration)*

**9:00 - Noon VPMIA General Membership Meeting Part 2**

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Vice President	Tom Clark
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Treasurer	Anthony McMahan
Executive Secretary	Christopher Martin
Immediate Past President	Dustin McLehaney

## DIRECTORS

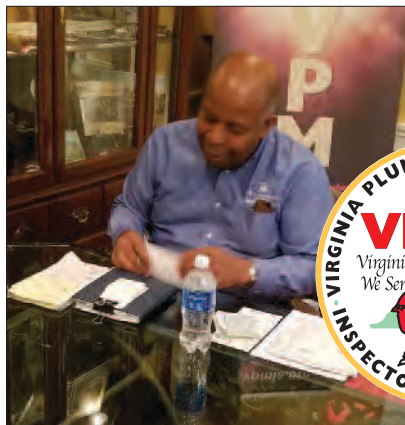
District 1 Director	Dennis Hart
District 2 Director	Mike LaPrade
District 3 Director	Donald Mimms
District 4 Director	Randy Pearce

## COMMITTEE CHAIRS

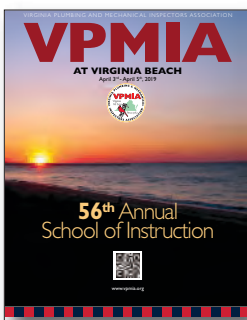
Advertising/Yearbook	Anthony McMahan
Auditing	Tom Clark
Awards	Randy Bowman
Bylaws	Dustin McLehaney
Certification/Education	Chris Hickey
Finance	Anthony McMahan
Information Technology	Jane Kim/Skip Harper
Legislative	Ronald Clements
Membership	Christopher Martin
Nominating	Dustin McLehaney
PMG Code	Richard Grace
Time & Place/School of Instruction	Bob Adkins

## AD HOC COMMITTEE CHAIRS

BCAAC	Randy Pearce
Building Safety Month	Mark Grimmell
VCEC Conference	Dustin McLehaney
VBCOA Liaison	Rick Witt



## Acknowledgements



This Yearbook comes to you, in part, thanks to industry support for the mission of VPMIA. Please join us in acknowledging each advertiser listed on **page 21** for their contribution. Their strong advertisement support offsets our printing costs.

Also, please visit and personally thank our Tabletop Exhibitors listed on **page 23**. The Advertising and Yearbook Committee gratefully acknowledges the technical article contributions of Wes Davis of ACCA and Shawn Strausbaugh of ICC, as well as the efforts of Vic Hines, Gary Cabbage, Ron Bladen, Jane Fitzgerald, and Doyle Printing toward the development of this 2019 Yearbook. — **Anthony McMahan, Chairman**



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It's been an honor and a privilege to serve as VPMIA's President this past year. I want to thank the VPMIA members for having confidence in me and providing me the opportunity to serve this great organization. We have

prepare for the next generation workforce. Once again, I would like to encourage all members to step up and be as active as possible, consider volunteering for a committee or maybe even consider serving as an officer or

over 1500 attendees from across the US and countries all around the world. The VPMIA Board of Directors awarded close to 20 full scholarships to our members for conference attendance. The code hearings included Plumbing, Mechanical and Fuel Gas final action decisions for the 2021 ICC codes. VPMIA continues to have a large presence and humbling success at the code hearings thanks to the hard work and dedication of the Plumbing, Mechanical and Fuel Gas (PMG) Committee members. The VPMIA PMG committee held several meetings to review code changes and developed fully vetted position statements for all of the proposed changes.



continued to be an industry leader in our profession. I'd like to express my deep appreciation for the hard work and commitment of all the officers, directors, committee chairs and members who have been instrumental in the seamless operation of the organization during this past year. Without such dedication and hard work, we could never have accomplished the success we have enjoyed. I would like to point out that many of our leaders have been taking on roles in the organization, for the first time, with results that have helped us better

director. The success of VPMIA depends on your involvement, engagement and interaction. This was truly an amazing year for Virginia and VPMIA. As many of you know, the International Code Council's (ICC) 2018 Annual Business Meeting and code development conference was in Richmond this year. The VPMIA was one of the host chapters for this event and your Board of Directors and our membership worked tirelessly to ensure the success of this conference. The attendance was overwhelming and exceeded all expectations. There were

I would also like to thank DHCD for their leadership and staff commitment who continually support our organization. They have been instrumental during our transition into the next generation. As I pass along the organization's gavel to the new up and coming leaders, I have every confidence that they will honor our past as they proudly propel us into the future.

Thank you,  
**James Anjam**  
 VPMIA President, 2018-2019

## VPMIA's Foundation

### Mission

VPMIA is an association of code professionals dedicated to promotion of uniform enforcement and development of the codes throughout the Commonwealth to assure the health, safety, and welfare of its citizens and any one who may live, work, or visit the state of Virginia. The pursuit of this endeavor is achieved through close, open, and equal working relationships with

design professionals, builders, contractors, material manufacturer's and others involved in the construction industry. VPMIA supports the ICC, its goals and mission.



### Strategic Plan Mission

VPMIA's strategic plan is to advance our mission through training in order to promote better understanding of the benefits and efficiency of using model codes. The association promotes teamwork, while embracing fairness and respect to all involved parties, always maintaining open communications in every aspect to those who participate in the process.

### Vision Statement

VPMIA members are committed to providing code development leadership and continuous training that results in uniform application of the codes. We look for opportunities to partner with all who are impacted and strive to develop and deliver codes and standards that result in health, safety, and welfare protection for the public.



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**EMORY R. RODGERS (1942 — 2018)**

This year, the VPMIA is dedicating our year-book in memory of Emory R Rodgers. Emory's dedication to the building code profession spanned more than 40 years. He accepted a position with Arlington County Inspection Services Division as the Chief/Building Official in 1978, from that day forward, he has been leader and mentor and has influenced most all of us here in Virginia in one way or another. He was an active participant in the VPMIA organization. He attended board meetings and regularly shared his wisdom with our membership. Emory was a leader in the industry and respected nationally as one of the pioneers in promoting uniform consistent enforcement of building codes.

Emory was President of BOCA International in the year 2000 and his leadership was instrumental in the formation of the International Code Council (ICC). In honor of Emory's accomplishments and all he has contributed to the building code community, ICC has created a higher education sponsorship program in his name, the "Emory R. Rodgers - Leadership in Building Safety Fellowship".

Emory loved Virginia, and his involvement ensured our strong presence in ICC. In fact, he was largely responsible for VA hosting the ICC annual conference in Richmond. He continued to work with Richmond Conference Core committee in his last year with us.

Emory's last official governmental position was with the Virginia Department of Housing and Community Development as Deputy Director of Building and Fire Regulations from 2004-2015. After his retirement in 2015 he continued to volunteer many hours developing the 2018 International Codes and the 2015 VUSBC adoption.

He will be missed.



## Resolution of Respect for John George Cooper

**Whereas** prior to his passing on February 5, 2019 at the age of 72 John was a Wilmington, DE. Native;

**Whereas** John is survived by his wife, Katherine Ann Cooper; three children and their spouses, Brendan Kyle Cooper, Aaron John and Taya Vladimirovna Cooper, Joshua Joseph and Ana Carolina Cooper;

**Whereas** John served in the Delaware National Guard from 1965-1971;

**Whereas** John brought over 20 years of experience as a master plumber to his position at Henrico County Building Inspections, where he dutifully served the county for 32 years, and taught the fuel gas code at Richmond Technical Center for many years;

**Whereas** John was a long time member in good standing of the Virginia Plumbing & Mechanical Inspectors Association; and

**Whereas** The Virginia Plumbing and Mechanical Inspectors Association notes with great sadness the passing of John Cooper; now therefore, be it

**Resolved**, That the Officers, Board of Directors, and the entire membership of the Virginia Plumbing and Mechanical Inspectors Association join the family of John Cooper in celebration of his life and do also offer their most heartfelt sympathy at the loss of this cherished family member; and

**Resolved**, that the Virginia Plumbing and Mechanical Inspectors Association stands in readiness to assist the family of John Cooper in any manner desired or requested; and

**Resolved further**, that this resolution be respectfully presented to John Cooper’s family as a permanent memorial to the memory of John Cooper.








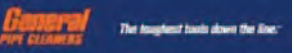







Adopted this first day of March, 2019







*James Anjam*  
James Anjam; VPMIA President

ATTEST: *Skip Harper*  
Skip Harper; VPMIA Past President

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## Resolution of Respect for Roy Nelson McFarland, Jr

**Whereas** prior to his passing on December 7, 2018 at the age of 79, Roy was a Roanoke, VA. Native;

**Whereas** Roy is survived by his daughters and sons-in-law, Robyn McFarland and William Burnette, Holly and Terry Sparks, Hope and Ryan Key, and Ashleigh and Darin Goad;

**Whereas** Roy worked for Sowers, Rhodes and Whitescarver as a plumbing designer, the City of Roanoke as a building inspector and as a safety security officer;

**Whereas** Roy was a two-time past president of the Virginia Plumbing and Mechanical Inspector's Association and a past president of Virginia Cross Connection Control Association;

**Whereas** Roy was a long time member in good standing of the Virginia Plumbing & Mechanical Inspectors Association; and

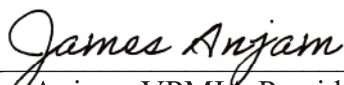
**Whereas** The Virginia Plumbing and Mechanical Inspectors Association notes with great sadness the passing of Roy McFarland, Jr.; now therefore, be it

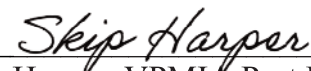
**Resolved**, That the Officers, Board of Directors, and the entire membership of the Virginia Plumbing and Mechanical Inspectors Association join the family of Roy McFarland, Jr. in celebration of his life and do also offer their most heartfelt sympathy at the loss of this cherished family member; and

**Resolved**, that the Virginia Plumbing and Mechanical Inspectors Association stands in readiness to assist the family of Roy McFarland, Jr. in any manner desired or requested; and

**Resolved further**, that this resolution be presented to Roy McFarland, Jr's family as a permanent memorial to the memory of Roy McFarland, Jr.

Adopted this first day of March, 2019

  
James Anjam; VPMIA President

ATTEST:   
Skip Harper; VPMIA Past President

# Photos from 2018





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R. Bruce Colton, Vice President  
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(as of March 1, 2019)

Barbee Jr., Philip S.  
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Backflow Technology, LLC  
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## **LIFE MEMBERS**

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Hydro Designs  
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sfox@hydrodesignsinc.com

## **LIFE MEMBER**

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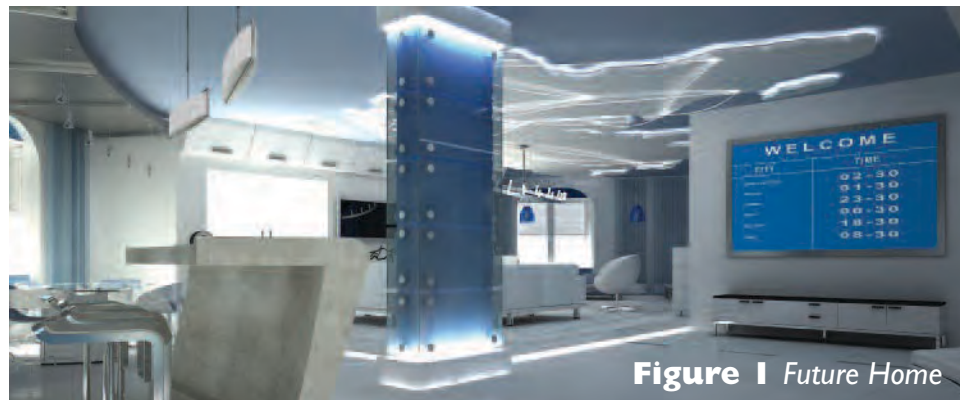
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# Preventing Problems

## from High Efficiency Homes



When we think of high-tech energy-efficient homes, we think of the future. In the coming years we think homes will be safer, more comfortable, and use very little energy. The homes to come are nearly airtight, well insulated, use special high-efficiency windows, doors, appliances, and lights. The ventilation system exhausts harmful pollutants and brings in healthy clean air for the family, pets, plants, and they all flourish in this healthy environment. The homes' construction ensures that it is easy to heat and cool. The home's integrated control system makes it all work seamlessly. Best of all, it all operates on small sips of power. It's a future paradise. (Figure 1)

But wait, these homes are built...**now!**

- Increased requirements adopted in the Virginia Energy Conservation Code (VECC) mandate tighter envelopes, better windows, and more insulation.
- High efficiency appliances are not for the rich or a radical environmentalist, they are standard fare at the local department store.
- Bright colorful watt-sipping lights and integrated control systems are inexpensive, easy to find, and easy to install.
- Ventilation systems exhaust foul odors, smoke, steam, and bring in

oxygen-rich air. These systems are necessary because homes aren't drafty, leaky sieves anymore.

- Consumers are willing to purchase even more additional energy efficiency measures, like those promoted by organizations such as the Consortium for Energy Efficiency.
- Many Home Builders capitalize on a market that is willing to pay for efficiency and comfort. (Figure 2)



The home of the future is built every day, all over Virginia, but these houses are not always paradise. Especially if the heating, ventilation, and air conditioning (HVAC) contractor is living in the past and uses old habits that lead to big problems. In the past, leaky homes with poor insulation allowed oversized, poorly installed furnaces and air conditioners to provide

acceptable levels of comfort, with very little chance of harming the occupants. However, today's tight, well-insulated, ventilated homes are not so forgiving. If the HVAC system is not properly designed, sized, and installed, then the house and the family living there could experience some real health and safety challenges.

### Challenge 1: Ventilation

In tight homes, ventilation air is needed to dilute volatile organic compounds, cooking odors, bathroom "bouquets", and other household smells. The strategy to bring in oxygen-rich outdoor air must be carefully considered. Winter outdoor air is cold and dry; in the summer it is hot and humid. The impact of cold dry air is primarily comfort related, it needs to be mixed with conditioned air or it can create a real annoyance. However, hot, humid, summer air is another matter. If it is not effectively pretreated, the moisture can harmfully affect the occupants and the structure.

### Challenge 2: Humidity

In addition to the moisture from ventilation, humidity is created by the owner's family, pets, and plants. Tight homes also retain moisture and traps it inside, so moisture from cooking, bathing, and cleaning stays in the house. In addition

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## Preventing Problems, *cont'd.*

to creating an uncomfortable home, the building components are affected too. Sheetrock retains more moisture and begins to grow black fuzzy organic material. Wood floors crown, and odors from moist conditions contribute to a miserable situation. A properly sized cooling system does a great deal to alleviate the humidity in a home. However, throughout Virginia, the moisture loads are more than the air conditioner can handle alone.

### Challenge 3: Airflow

In the past, a room needed a lot of warm or cool air to maintain comfort. When the HVAC system came on, a large volume of conditioned air rushed into the room. The warmed or cooled air swirled and mixed with the room air, the blended air spread throughout the space and created occupant comfort. In today's energy efficient homes, rooms usually have a very small load and they only need a wisp of air. Small loads and low airflow should be a good thing, right? The impact is that the wisp of air provides no turbulent force to mix with the room air, so cool air puddles on the floor, or warm air floats up to the ceiling. The warm or chilled air will eventually dissipate into the room (after all nature hates a vacuum), but comfort is compromised.

### Challenge 4: Comfort

Decades ago when building envelopes were looser and lower insulation levels were allowed, HVAC systems were often sized from a rule-of-thumb, like 500 sqft/ton. Oversized equipment led to higher installation costs, possible early equipment failure, and reduced comfort due to short run cycles. If you see a home that is compliant with the 2015 VECC, and the equipment capacity is still about 500 sqft/ton, then this HVAC

system is likely to cause the homeowner dissatisfaction. A 3,000 sqft home that is compliant with the VECC may only need a two-ton air conditioner and a 40,000 Btu furnace. If the plans call for a five-ton system, something is wrong.

### Challenge 5: Apartments and Condos

As a code official you will encounter small dwellings and their associated small loads. The same challenges that face energy efficient homes could also face a typical condominium (even if it's not built to VECC requirements). All small dwellings face similar challenges: properly sized systems for the small heating and cooling loads, ventilation air systems, humidity control, and good air mixing.

Far from paradise, it seems high-efficiency homes, and other dwellings with low loads, often become disasters waiting to happen.

You can restore health and safety while you promote efficiency and comfort. There are solutions to these challenges:

1. **Small Equipment** – Manufacturers are beginning to produce one-ton cooling systems and 20,000 Btu furnaces for these low-load applications.
2. **Small Duct High Velocity (SDHV) Systems** – This equipment solution uses very small supply air outlets and high velocity air stream jets to promote air mixing.
3. **Fan-Powered Mixing Box** – An ancillary air handler mixes conditioned air with room air and distributes it at airflows that are associated with larger HVAC systems.
4. **Capacity Deployment System** – A system that uses zone-dampers to imitate a larger heating/cooling system. Normally, the zone dampers are



For more discussion on the strategies see

**ACCA's Manual LLH  
(HVAC Design for  
Low Load Homes).**

closed for all zones. When one zone needs heating or cooling, the system energizes and directs all conditioned air to that zone. When the zone is satisfied, the dampers could open and condition another zone, or shut down.

5. **Engineered Bypass Air** – Similar to the Fan-Powered Mixing Box, a supplemental air handler mixes conditioned air with room air to promote good air mixing.
6. **Supply Air Nozzles** – Nozzles typically used with SDHV systems on standard-sized duct systems.
7. **Dehumidification** – Install ancillary equipment with enough capacity to remove the moisture load in the house (ACCA Manual S has sizing procedures).

Energy efficiency is good stewardship when it doesn't harm the well-being of, or endanger, the home owner. You are the first line of defense to protect consumers from problems associated with failure to comply with code requirements; forewarned is forearmed. Ensure homes constructed to the VECC have properly sized HVAC equipment and employ strategies to promote good air mixing and control humidity. ■



#### About the author:

*Wes Davis serves as the Vice President of the ACCA Quality Assured Programs supervising contractor accreditation efforts, recognizing quality contractors and HVAC system quality installations. Wes has over 20 years' experience in the HVAC industry. He has been a licensed HVAC contractor in South Carolina, serves on many ASHRAE technical committees, wrote Bob's House, serves on RESNET's Standards Management Board, and has helped develop several ANSI-recognized standards.*



FIGURE 1301.3  
PICTOGRAPH—DO NOT DRINK

# Nonpotable Water Systems

**Water, our most precious resource!** Without water life as we know would cease to exist. With that said, it is of the utmost importance that we do all in our ability to protect and conserve our most precious resource.

Let's now look at how water conservation, in the realm of water reuse, has progressed in the International Plumbing Code (IPC) and dive a little deeper into some of the key parts of the 2015 Virginia Plumbing Code (VPC) which support reducing the demand on our potable water supply.

First, a little history on some of the provisions that are currently found in the 2018 IPC and the future 2021 edition of the IPC. In the 2009 IPC, the Gray Water Recycling System was found in Appendix C, which was not officially adopted as part of a plumbing code unless a jurisdiction took action to adopt the Appendix as law or regulation.

In the 2012 IPC code development process, Appendix C was deleted and the content was relocated into Chapter 13 of the code. Relocating the provisions makes it much easier for gray water recycling systems to be designed, reviewed, and approved.

During the 2015 IPC code development cycle, Chapter 13 was substantially altered and re-titled Nonpotable Water Systems, and a new Chapter 14 was added which addresses subsurface landscape irrigation systems. The updates to Chapter 13 ex-

panded the scope of nonpotable water systems to include not only graywater systems, but also rainwater and reclaimed water systems. These additional systems are significant in conserving our most precious resource... "water".

In the 2021 IPC code development cycle, a new ICC/CSA Rainwater Harvesting Standard was included for nonpotable rainwater uses which furthers the goal of water conservation. The new ICC 805-2018 Rainwater Harvesting Standard also includes potable water reuse provisions. However, as we have seen in past code development cycles, these provisions sometimes take a few code cycles to actually get into the code.

Now let's touch on some key provisions found in the 2015 VPC that are related to nonpotable water systems. It's important to remember to apply these VA specific amendments in addition to the 2015 IPC provisions.

The specific sections and information given below are not to be construed as the complete requirement for nonpotable water systems, but merely a summation of some key points for these systems specific to Virginia.

## VPC Definitions

There are two definitions in the 2015 IPC that were modified by VA state amendments.

First, VA defines Rainwater as – "Natural precipitation, including snow melt,

from roof surfaces only." This definition makes it clear that rainwater that would be used for nonpotable reuse needs to come from roof surfaces only. The second definition modified by VA is Reclaimed Water – "Reclaimed water means water resulting from the treatment of domestic, municipal, or industrial wastewater that is suitable for a water reuse that would not otherwise occur. Specifically excluded from this definition is "gray water."

## VPC Chapter 3

Section 301.3, contains an exception that permits wastes from bathtubs, showers, lavatories, clothes washers, and laundry trays, to connect to an approved system in accordance with Chapter 13. This exception allows the waste-water flows to be a source of water that can be reused for the purposes of water-closet and urinal flushing. These waste-water flows must be collected by a drainage system that is wholly separate from the sanitary drainage system so that extensive treatment of this water is not required before reuse.

## VPC Chapter 13

Section 1301 lays out the general requirements for nonpotable water systems and governs the materials, design, construction, and installation of nonpotable water systems.

Under Section 1301.1.1, "all portions of the nonpotable water system subject to this code must be constructed using the

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## Nonpotable water systems, *cont'd.*

same requirements for potable water or drainage systems as provided for in this code unless otherwise specified in this chapter.”

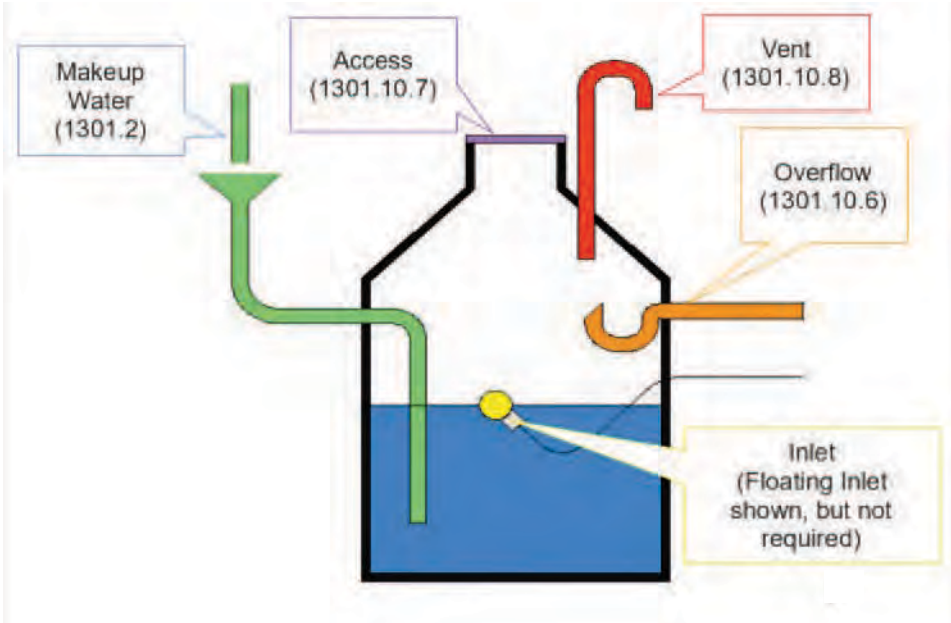
The rest of Section 1301 provides the base requirement for nonpotable water systems which includes signage for non-potable water outlets such as hose connections, open pipes, and faucets, under Section 1301.4. Note that specifically in the VPC under Section 1301.4, water closets and urinals that use a non-potable source are not required to have signage posted.

Section 1301.16.3 sends the user back to Section 608.8 which clearly states the requirements for identification of non-potable water systems.

Pipe that is purple in color must be used to identify gray water, rain water, and reclaimed water, piping systems and this pipe must be embossed, or integrally stamped, or marked with the words: “CAUTION: NONPOTABLE WATER – DO NOT DRINK”. This identification is provided to make sure that all non-potable water system piping is clearly defined so that there is no confusion as to the product that is inside of the piping system which should curtail any unintentional cross connection.

Section 1301.18 requires that operation and maintenance manuals for non-potable water systems be provided by the system component manufacturer and supplied to the owner. These manuals must be kept in a readily accessible location so that someone servicing the system has the base documentation on the systems as installed. Makeup water, filtration, disinfection, storage requirements (including location of storage tanks), potable water connections, and freeze protection, are some of the other key portions of the nonpotable water systems identified in Section 1301.

Section 1302 is specifically labeled as gray water nonpotable water systems.



Under Section 1302.1, it states, “This code does not regulate *equipment* used for, or the methods of, processing, filtering, or treating gray water, that may be regulated by the Virginia Department of Health or the Virginia Department of Environmental Quality.” It is imperative to have some knowledge on these regulations in regard to these specific areas. Gray water, nonpotable water systems are not to receive the discharge of waste that contain fecal matter, urine or kitchen type waste as it is well documented that this type of waste could be detrimental to the gray water system. Further, let’s remember the clear definition of gray water which limits the fixtures permitted to discharge to a gray water collection system.

Another key factor for gray water systems is that untreated gray water cannot be stored for any greater than 24 hours, per Section 1302.4. Significant bacterial growth could occur that would possibly adversely affect the disinfection or treatment process and ultimately the end use. Storage tank requirements are found in Section 1302.3, which sends you back to the general Section 1301.10. Specifically, tank standards that are called for under 2015 IPC Section 1302.7.2, are not required to be met per the 2015 VPC, as the tank standards given may not have best suited the type of systems being designed and installed. All of the required test and inspection sections in 1302.12 of the VPC are deleted as the charging scope of this

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## Nonpotable water systems, *cont'd.*

Chapter requires that nonpotable water systems subject to this code must be constructed using the same requirements for potable water, or drainage systems, as provided for in this code unless otherwise specified in this Chapter. Based upon this scope, the user would revert back to the testing and inspection requirements found in Section 1301.17.

Section 1303 covers the specific requirements for nonpotable rainwater collection and distribution systems. Rainwater is typically plentiful in the Commonwealth of VA and many jurisdictions are already using these code provisions. The collection surface where the precipitation is to be harvested is important and is further addressed in Section 1303.3, where it made clear that discharges that are not from natural precipitation collected from above-ground impervious roof surfaces are not to be introduced into the rainwater collection system. This section also clearly states that other flows, including but not limited to, evaporative coolers, water heaters, and solar water heaters, must not discharge onto rainwater col-

lated on the collection surface from entering the rainwater collection system. You will find many of the same or similar requirements in the rainwater system section that are found in the graywater section. Rainwater, however, does not have the same limitation as graywater in regards to how long an untreated source can be stored.

Section 1304 addresses reclaimed water systems, so let's be reminded of the defined term we discussed initially in this article. Under Section 1304.1, reclaimed water systems and the reuse of reclaimed water are specified in and governed by the VA Water Reclamation and Reuse Regulation (9VAC25-740). Permits for these systems are required to be obtained from the VA State Water Control Board. Section 1304.1 also governs "the design, construction, installation, alterations, and repair of plumbing fixtures, piping or piping systems, storage tanks, drains, appurtenances and appliances that are part of the distribution system for reclaimed water within buildings and to storage tanks for reclaimed water as defined in the Virginia Water Reclamation and Reuse Regulation (9VAC25-740) and associated piping outside of buildings that deliver reclaimed water into buildings. Where conflicts occur between this code and the Virginia Water Reclamation and Reuse Regulation (9VAC25-740), the provisions of the Virginia Water Reclamation and Reuse Regulation (9VAC25-740) shall apply unless determined otherwise by

1304.2 must meet the applicable requirements of Section 1301, but it is noted that several exceptions exist and two of these noted exceptions take the user back to the Virginia Water Reclamation and Reuse Regulation (9VAC25-740) for guidance.

With the 2018 ICC Group A code cycle now being complete, I am more than happy to report that the new CSA B805-18/ICC 805-2018 - Rainwater Harvesting Systems Standard will be referenced in the 2021 IPC and 2021 IRC. This Standard provides even further guidance in regard to rainwater harvesting systems and this change was successful with the input and testimony of Virginia Code Officials.

With the history given above, it is key that Code Officials continue to use all of the methods available to make water conservation a priority. VPMIA has and continues to be a leading ICC PMG Chapter in the ICC code development process. VPMIA played a key role in many of the above changes that resulted in the current nonpotable water provisions found in the IPC and upcoming 2021 IPC and IRC. I am happy to say that I was given the opportunity to assist in some of this work in the past as a member of VPMIA. With that I say THANK YOU to the VPMIA membership on behalf of ICC and look forward to this organizations continued work to make all of the International Codes stronger. ■

### **About the author:**

*Shawn Strausbaugh, the Director of PMG technical resources for the International Code Council's Government Relation Department, joined the ICC team just a year ago however brings over 20 plus years of experience with municipalities in both Virginia and Pennsylvania as a Code Official which included both inspection, plan review and administrative duties. Shawn holds numerous ICC Certifications in not only PMG related disciplines but also building, energy and accessibility. Shawn is also a Master Plumber which was gained when completing his apprenticeship and journeyman status while being employed in PA.*



lection surfaces. First flush diverters, found in Section 1303.4 are also a key component in keeping contaminants, or other impurities, that may have accumu-

lated on the collection surface from entering the rainwater collection system. You will find many of the same or similar requirements in the rainwater system section that are found in the graywater section. Rainwater, however, does not have the same limitation as graywater in regards to how long an untreated source can be stored.





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**This year's Auxiliary activities were cancelled due to unforeseen events.** To those expecting to join us for an educational tour, some creative activity and friendly bingo, we extend our apologies and encourage you to contact us early in anticipation of our gathering in 2020.

We offer a standing invitation to spouses attending the SOI with a member to participate as our guests at any Auxiliary activities in hopes it will be fun and spark another gathering with us.

**WHAT MEMBERS SHOULD KNOW ABOUT THE AUXILIARY**

The Ladies Auxiliary is an ancillary group formed at the same time as, VPMIA. Its purpose is to support the Association's endeavors through supporting our spouse' participation. VPMIA members are encouraged to introduce their spouses to the SOI and the Auxiliary is a ready-made social experience. Other than a short but necessary business meeting, activities during the daytime meetings are meant to be entertaining and leave time for socializing with the SOI group at the luncheons and dinners. We strive to get the most out of the SOI venues that take place throughout Virginia. This group is all about having fun along the way. Join us!



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# Crest waves with this tool: Residential Plans Examiner's HVAC Review Form

ACCA developed this form to facilitate enforcement of the Virginia Residential Code by VPMIA members. It can be customized with your department's logo and is available for free download at [www.acca.org/codes](http://www.acca.org/codes)

Form RPER 1 D1  
8 Mar 10

Residential Plans Examiner Review Form  
for HVAC System Design (Loads, Equipment, Ducts)

County, Town, Municipality, Jurisdiction  
Header Information

REQUIRED ATTACHMENTS:  
Manual J Form (and supporting worksheets)  
or AHJ Form (and supporting worksheets)  
OEM performance data (heating, cooling, dehumidification)  
Manual D Worksheet (and Worksheet)  
Duct distribution system data.

ATTACHED  
Yes No  
Yes No  
Yes No  
Yes No

Contractor \_\_\_\_\_  
Mechanical License # \_\_\_\_\_  
Building Plan # \_\_\_\_\_  
Home Address (Street or Lot#, Block, Subdivision) \_\_\_\_\_

**HVAC LOAD CALCULATION (IRC M1401.3)**

**Design Conditions**

**Winter Design Conditions**  
Outdoor temperature \_\_\_\_\_ °F  
Indoor temperature \_\_\_\_\_ °F  
Total heat loss \_\_\_\_\_ Btu/h

**Summer Design Conditions**  
Outdoor temperature \_\_\_\_\_ °F  
Indoor temperature \_\_\_\_\_ °F  
Design difference  $\Delta Gr @$  \_\_\_\_\_ % Rh  
Sensible heat gain \_\_\_\_\_ Btu/h  
Latent heat gain \_\_\_\_\_ Btu/h  
Total heat gain \_\_\_\_\_ Btu/h

**Building Construction Information**

**Building**  
Orientation (East door faces) \_\_\_\_\_  
Number of bedrooms \_\_\_\_\_  
Conditioned floor area \_\_\_\_\_ Sq Ft  
Number of occupants \_\_\_\_\_  
Floor-to-ceiling height \_\_\_\_\_ Ft

**Windows**  
Excess overhang depth \_\_\_\_\_  
Internal shade (blinds, shades, etc.) \_\_\_\_\_  
Number of skylights \_\_\_\_\_

**HVAC EQUIPMENT SELECTION (IRC M1401.3)**

**Heating Equipment Data**  
Equipment type \_\_\_\_\_  
Model \_\_\_\_\_  
Sensible cooling capacity \_\_\_\_\_ Btu/h  
Latent cooling capacity \_\_\_\_\_ Btu/h  
Total cooling capacity \_\_\_\_\_ Btu/h

**Cooling Equipment Data**  
Equipment type \_\_\_\_\_  
Model \_\_\_\_\_  
Sensible heating capacity \_\_\_\_\_ Btu/h  
Latent heating capacity \_\_\_\_\_ Btu/h  
Total heating capacity \_\_\_\_\_ Btu/h

**HVAC DUCT DISTRIBUTION SYSTEM DESIGN (IRC M1601.1)**

Design airflow \_\_\_\_\_ CFM  
External Static Pressure (ESP) \_\_\_\_\_ IWC  
Component Pressure Losses (CPL) \_\_\_\_\_ IWC  
Available Static Pressure (ASP) \_\_\_\_\_ IWC

Longest supply duct \_\_\_\_\_ Ft  
Longest return duct \_\_\_\_\_ Ft  
Total Effective Length (TEL) \_\_\_\_\_ Ft  
Friction Rate \_\_\_\_\_ IWC

Duct Materials Used (specify)  
Trunk Duct: Duct board, Flex, Sheet metal, \_\_\_\_\_  
Branch Duct: Duct board, Flex, Sheet metal, \_\_\_\_\_

I declare the load calculation, equipment selection, and duct system design were rigorously performed based on the building plan listed above. I understand the claims made on these forms will be subject to review and verification.  
Date \_\_\_\_\_

Contractor's Printed Name \_\_\_\_\_  
Contractor's Signature \_\_\_\_\_

Reserved for use by County, Town, Municipality, or Authority having jurisdiction.

The AHJ shall have the discretion to accept alternate calculations, then verify compliance meets requirements, and Alternate Unit(s) (Specify on page 13 of instructions).  
A standard version of Manual J is used for load calculations, then verify compliance meets requirements, and Alternate Unit(s) (Specify on page 13 of instructions).

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**And check out these ACCA resources for code officials at [www.acca.org/codes](http://www.acca.org/codes)**

- **Brochures** addressing the verification of ACCA Manuals J (load calculations), D (duct sizing), and S (equipment selection)
- Three-part video series, **What Code Officials Need to Know About HVAC System Design**
- **Bob's House**, a residential HVAC design case study

