ICC 815 Sizing Water Distribution, Drainage and Venting Standard Consensus Committee (IS-SWDDV)

Meeting #4 - Minutes

June 26, 2023

Chair: Gary Klein
Vice Chair: Philip Parisi
Secretariat- Ramiro Mata

The fourth meeting of the ICC 815 Sizing Water Distribution, Drainage and Venting Standard Consensus Committee (IS-SWDDV) was held on June 26, 2023 in virtual format. The meeting was conducted in accordance with ICC's Consensus Procedures. https://www.iccsafe.org/wp-content/uploads/ICC-Consensus-Procedures-ANSI-approved-8_2_21-BOD-apprvd-8_27_21.pdf

1. Welcome
   Chairman, Gary Klein, convened the meeting and welcomed attendees at 2:05pm EDT along with Staff Secretariat, Ramiro Mata. Mata reminded attendees about the ICC Code of Ethics and the Anti-Trust Policy, both of which can be found in the ICC 815 (IS-SWDDV) webpage. Mata also announced that the meeting will be recorded for internal reference only and that recording by anyone other than ICC staff is prohibited.
2. Roll Call – Klein called the meeting to order with a roll call of ICC 815 (IS-SWDDV) committee members – Symbol ☑ indicates present, ☐ indicates absent.

Committee Members

Regulator		User		Manufacturer		Builder	
☑	Joseph Alexander	☑	Esber Andiroglu PhD, PE	☑	Marcus Elmer	☑	Dan Buuck
☑	Richard Grace	☑	Gary Klein	☐	Dave Parney	☑	Joshua Trujillo
☐	Terry Haughn	☑	John Lansing	☑	Lance MacNevin PE	**Consumer**	
☑	Thomas Roberts	☑	Juneseok Lee PhD, PE	☑	Kyle Thompson PE	☑	Tim Keane
☐	Ross Wakefield	☑	Philip Parisi Jr. PE			**SDO/Test Lab**	
						☐	Kathryn (Katie) Foster

ICC Staff – Matt Sigler, Mark Fasel
Interested Parties and Guests – Dan Cole, Steve Deem, Markus Lenger, Drew Rich, David Nickelson, Rich Houle, Michael Gormley, Elise Wall, Steffi Becking

1. Quorum and Membership Review - With 13 committee members in attendance, Mata indicated the threshold of 10 for quorum has been met.

2. Agenda Review and Approval – Revised agenda to combine item #8, Develop Research Project Outline, with item #11, Design of Experiment Presentation. Thompson moved to approve, seconded by Lansing.
3. Approval of Meeting #3 Minutes from June 1, 2023 – MacNevin moved to approve, seconded by Thompson.
4. Review of Action Items
    a. Send email template for monitoring request to ICC for review – Rich will update as part of the University of Miami research update.
    b. Provide plans for University of Miami buildings for monitoring – Rich named several University of Miami buildings that are available for monitoring.
    c. Suggest locations to collect pipe samples after demolition – Alexander. The committee tabled the discussion until after the Measurement Working Group meeting.
    d. With approval, upload presentations from speakers -Mata reported that Roberts' presentation is not yet ready for public consumption but will upload Lansing's presentation before the next committee meeting.
    e. Title/Purpose/Scope –
        i. Types of Occupancies in Residential Buildings
            1. Discussed including transient buildings such as hotels, nursing homes and dorms. Lansing suggested placing hotels in a different category since they may not be continuously occupied. Pipes are also sized differently for healthcare facilities because of different water usage patterns.
            2. Institutional occupancies such as prisons were mentioned as an interest but not something to pursue at this point.
            3. Lansing mentioned that the focus should be on residential mixed-use because it represents a significant amount of multi-family units being built today. Keane added that focus should be on non-private facilities with central water heating systems.
            4. There was agreement that pipe sizing has the lowest impact on residential, private/multi-family buildings.
            5. Factors impacting water system demand-
                a. Water reuse- Impacts the water demand because it changes the water supply to water use proportion.
                b. Work shifts – Water demand in nursing homes is significantly higher during the day shift when doctor visits and patient bathing occurs.
        ii. Naming Conventions – In Progress. Grace will continue to gather more photos and will present them to the committee at a future meeting.
            1. Klein suggested adding return piping.
            2. Deem asked about non-potable water produced within the building for reuse. Lansing replied that it would fall under cold water piping with respect to pipe sizing.

3. Klein suggested potentially adding urine diversion systems. Lansing replied that those systems are gaining popularity.
4. Lee asked about the scope of the naming convention. Klein replied that it begins from the piping supplying the building and the waste pipe leaving the building.
5. Andiroglu suggested separating demand estimation across fixture types because sizing one supply stream might be significantly different than another.
6. Gormely suggested using the term 'Air Pressure Alleviation' instead of 'Venting'. Lansing and Klein agreed.
7. Mata suggested adding naming of buildings themselves to list of naming conventions as mentioned by Keane earlier. Klein agreed to add to the list.

5. Measurement Working Group (MWG) Update – John Lansing (Chair of MWG)
    a. MWG scheduled to meet on June 27, 2023- Will discuss equipment to purchase. Klein mentioned the instrument presentation from Markus Lenger will provide additional insight.
6. California Water Demand Calculator Project – Elise Wall, from 2050 Partners presented the results of the California Plumbing Code advocacy project comparing the Water Demand Calculator to traditional pipe sizing methods and actual water flows. Her presentation will be uploaded onto the ICC 815 webpage. Discussion followed:
    a. Pipe Scale: Some design professionals elect to use larger pipes to compensate for scaling caused by water harness & low velocities. As a result, pipe cross sectional area decreases while head loss increases and flow rate decreases. According to MacNevin, they have not seen tuberculation or buildup in plastic pipes over time. Replying about copper pipe, Elmer stated that only natural biofilm will occur but no significant buildup if the system is properly designed, maintained, and operated. Klein mentioned most of the buildup is likely from galvanized systems.
    b. Water Quality – Design professionals should consider water quality. According to Cole, Dr. Hunter recommended using a different nomograph if scaling is anticipated. Hazen-Williams coefficient would need to be adjusted to compensate for the roughness of pipe due to scaling. Dr. Hunter also did experiments on the waste side to develop coefficient of friction for drainpipes.
    c. Water Use – One second interval of data collection is needed because many events are short duration from 5-30 seconds. However, a one second peak does not seem to matter according to Klein, who is also one of the leaders of the study. Lansing stated peak demand is important because of high velocity, hydraulic shock and noise.
    d. Data – In the study, 50% of the flow rate was under 1 gpm in pipes designed for 50-60gpm according to Klein. Keane stated one second data will not be relevant in the overall scheme of pipe design. Rich added data collection will shape how failure in demand is defined.
7. Design of Experiments Presentation – Rich provided an update from the University of Miami perspective.

a. Discussed introductory meetings researchers from Deakin University, Heriot-Watt University, Chartered Institute of Building Services Engineers.
b. Activities with the ICC Water Reuse Working Group
c. DERM (Department of Environment Resource Management, Miami) – Data Collection Query. Working on acquiring data for residential buildings for the past 20-30 years.
d. University of Miami Facilities – Floor Plans received.
e. Produced Work Objectives
    i. Conference Paper – Methodology is taken to develop standards and announcements in the global community of ongoing efforts. Rich and Esber working on preliminary draft for the CIBSE W062 Conference in Belgium. Not confirmed if presenting due to confusion with deadline.
    ii. Below are work in progress which will be included in the end of year report:
        1. Begin Data Collection – Start collecting data on hi-rise residential buildings to compare metrics from ideal to real life.
        2. Water Demand Identification – Paper highlighting all different methods and the basis of their analysis for predicting peak demand to highlight pros and cons.
        3. Beginning of Pipe Sizing Review Paper – Identifying methods used to size pipes based on pressure loss. Basis for their analysis and considerations. Identify opportunities for improvement that extend beyond pressure loss to include development of new guidelines.
        4. Literature Review – Ongoing. Added two undergrad students to help. Rich did an overview of a spreadsheet providing notes/summaries of all literature that have been reviewed and for committee to keep track of progress.
        5. End of Year Outline
            a. Brief history of modern plumbing
            b. Project Objectives and Scope
            c. Data Collection/Synthesis of existing data sources with collaboration; Experimental Design; Current Uses (post COVID)
            d. Existing Methods for Water Demand and Pipe Sizing
            e. Proposed Solutions
    iii. Water Demand Comparison – Compare field data to water demand methods and variations in predictions.
    iv. Pipe Sizing Review with Field Data Comparison
    v. Definitions Guide – Identifying key components and creating a translation guide. Develop methodology for review.
f. Klein took polls (includes non-committee members) – Voters agreed to measure flow rate, temperature, pressure of incoming cold water into buildings and flow rate of wastewater.

   g. Lansing asked frequency of data collection for horizontal drain line. Gormely stated they collect air pressure data at a frequency of 500Hz because pressure transients travel at the speed of sound.
   h. Keane: Pressure and temperature data may not be critical for this project but because the cost to collect will be low, it should be collected because it can be used for other projects.
   i. Research Oversight Working Group- Klein suggested discussing how to establish the working relationship between the University of Miami and the 815 committee at the next meeting.
      i. Andiroglu: It will be focused on measurement and data collection in the coming year, but we are looking for the committee to define the scope. Piping materials and pressure losses may be areas for working groups to investigate.
8. Data Acquisition and Analysis Presentation – Lenger from Blusense
   a. Many issues need to be considered with data collection such as installation, data protocols, connectivity/communications, data quality/integrity, power supply, analysis/reporting, ease of use.
   b. Blusense developed a solution that is easy to install with multiple connectivity options, redundant data storage, stable power supply, integrated database and visualization tools, easy to use.
   c. At a minimum, data collection should be once per second(1Hz).
   d. Compared inexpensive sensors with expensive ones.
   e. Lansing: Can data be collected at 40Hz – 400Hz?
      i. Blusense will help determine proper sensors and provide a system which works with the sensors and allows for data storage locally and remotely. It can also do the analysis.
9. Continue Discussion of Title/Purpose/Scope - Tabled
   a. Types of Occupancies in Residential Buildings
10. New Business –
   a. Scheduling 2024 committee meetings- Klein recommended avoiding conflicts with ASHRAE winter and summer conferences. The 2024 ASHRAE conference is scheduled for January 20-24, 2024 in Chicago, IL.
   b. Unintended Consequence of Right Sizing – Klein asked committee members to be prepared to provide thoughts for the next meeting.
11. Old Business -
12. Next Meeting – July 27, 2023 at 1pm-5pm Central (2pm-6pm Eastern)
13. Adjournment