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

**Meeting #5 - Minutes**

**July 27, 2023**

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

The fifth meeting of the ICC 815 Sizing Water Distribution, Drainage and Venting Standard Consensus Committee (IS-SWDDV) was held on July 27, 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 2:04pm 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 – Mark Fasel
Interested Parties and Guests – Dan Cole, Drew Rich, David Nickelson, Rich Houle, Tom Wise, Natascha Milesi-Ferretti

1. Quorum and Membership Review - With 11 committee members in attendance, Mata indicated the threshold of 10 for quorum has been met.
2. Agenda Review and Approval – Revised agenda to move item #10 – Non-US Pipe Sizing Methods ahead of item #7- Review of Actions Items. Approved by consensus.
3. Approval of Meeting #4 Minutes from June 26, 2023 – Approved by consensus.

4. Non-US Pipe Sizing Methods – A copy of each presentation will be included in the minutes if permitted.
    a. Germany (Frank Schmidt):
        i. The German pipe sizing methodology focuses on designing a slim system with low water content to minimize water age and maintain required water temperatures. The principle is to size pipes as small as possible and use turbulent flow to prevent the build-up of biofilm. There is no fixed value for minimum velocity, but velocities are typically between 1-2 meters per second in main distribution pipes and below 1 meter per second in circulation systems.
        ii. EN 806 is regarded as a minimum requirement. Germany uses DIN 1988-300 as appendix because: EN 806 is only for residential buildings; DIN 1988-300 uses different curves for different building types instead of a simultaneous curve which is not practical; sizing is based on flow rates; EN 806 does not contain methods for hot water return pipe sizing.
        iii. Manufacturers of pipe systems must provide data on pressure loss coefficients for fittings, which are used in hydraulic calculations. VDI documents contain standard values from different manufacturers that designers can use when selecting fittings.
        iv. In large densely populated buildings, hydraulic balancing is achieved by using available pressure efficiently through reducing pipe sizes nearer to the source while maintaining equal flow pressures at outlets. This approach minimizes volume and reduces cost while ensuring sufficient pressure at distant fixtures.
    b. New Zealand (Ross Wakefield):
        i. Ross Wakefield presented pipe sizing research commissioned by the New Zealand government. The study compared four international water supply pipe sizing methods against Australia and New Zealand standard 3500 Part One water services. Findings showed that diversified flow calculation methods result in very different flow rates when compared at the same fixture loadings.
        ii. Wakefield's shared graphs comparing diversified flow curves from various documents such as German Standard 9983-2012; British European Standard BC806 Part 3; United States Uniform Plumbing Code (UPC) 2018 version with Appendix A & G; Plumbing Engineering Services Design Guide published by British Institute of Plumbing (IOP). These curves were plotted based on fixed groups equivalent to typical one-bathroom apartments.
5. Review of Action Items
    a. Suggest locations to collect pipe samples after demolition – Ongoing. (Alexander)
    b. Title/Purpose/Scope – Ongoing (Klein)
        i. Types of Occupancies in Residential Buildings
    c. Naming Conventions – In Progress. Grace will continue to gather more photos and will present them to the committee at a future meeting.
        i. Plumbing Fixtures/Appurtenances/Appliances
        ii. Water Supply Piping, Hot/Cold
        iii. Wastewater Piping, Black/Gray
        iv. Recirculation Piping
        v. Venting
        vi. Occupancies/Building Types

vii. Urine Diversion Systems

6. Research Oversight Working Group – Esber Andiroglu
    a. Phase I Information Gathering report is expected to be completed by the end of August 2023.
    b. The Chair proposed and the committee agreed to add Research Updates as a standing agenda item. Feedback on Phase I report will be discussed during this item.
    c. Phase II, Development of Pipe Sizing Methodology will focus on data collection from monitoring sites to develop pipe sizing methods.
7. Measurement Working Group Update – John Lansing, Chair
    a. The working group is compiling a list of sensors and data acquisition equipment necessary for monitoring and collecting data from buildings at the University of Miami, as well as other locations. A spreadsheet was created on a shared webpage for this purpose.
    b. Research methodology for data acquisition, including frequency of data collection for water flow, pressure flow, and airflow side was also discussed.
    c. The plan is to prioritize the building at the University of Miami that is going to be demolished as the first to be monitored.
8. New Business –
    a. Unintended Consequence of Right Sizing:
        i. Lansing mentioned concerns over water hammer and pressure loss on the supply side due to smaller diameter piping than usual while drainage side concerns include reduced airflow leading to breaking traps in drains flowing at more than 50% billing rate.
        ii. MacNevin expressed concern if the number of people in buildings changes dramatically due to cultural changes or calamities.
        iii. Wakefield mentioned some areas in New Zealand have undersized water mains due to population increase. Klein stated in California research has shown that because of low flow water fixtures, water use has decreased even with an increase in population.
        iv. Andiroglu stated there are currently built-in safety factors to account for the increase in population.
        v. Foster is concerned about pipe material leaching into the potable water because the water volume to pipe surface area will be much smaller.
        vi. Roberts mentioned a study lead by Brandon Josey that compared pre and post COVID water use showed peak demand was less during COVID due to random use. He added that in Australia they use orifice mixing valve which will be more sensitive with smaller pipe sizes.
        vii. Lansing mentioned that vents in buildings also act like ventilation for the sewer system. Fire service in buildings is separate from the cold-water supply so right sizing will not be impacted.
9. Action Items – Contact the following to present to the committee (Mata):
    a. Natascha Mileti-Ferretti - NIST Plumbing Research Presentation
    b. Phil Woolhouse - Water Hammer (Cyclic Pressure) Research Presentation
    c. Pete DeMarco - Drain Line Carry Study
    d. Frank Schmidt - German Waste/Drain Research
10. Old Business – None were presented.

11. Next Meeting – August 21, 2023, at 1pm-5pm Central (2pm-6pm Eastern)
12. Meeting Adjourned at 5:40pm EDT.