Water Efficiency Standard for the Built Environment

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The IAPMO Group

Need, Purpose and Scope for the Water Efficiency and Sanitation Standard

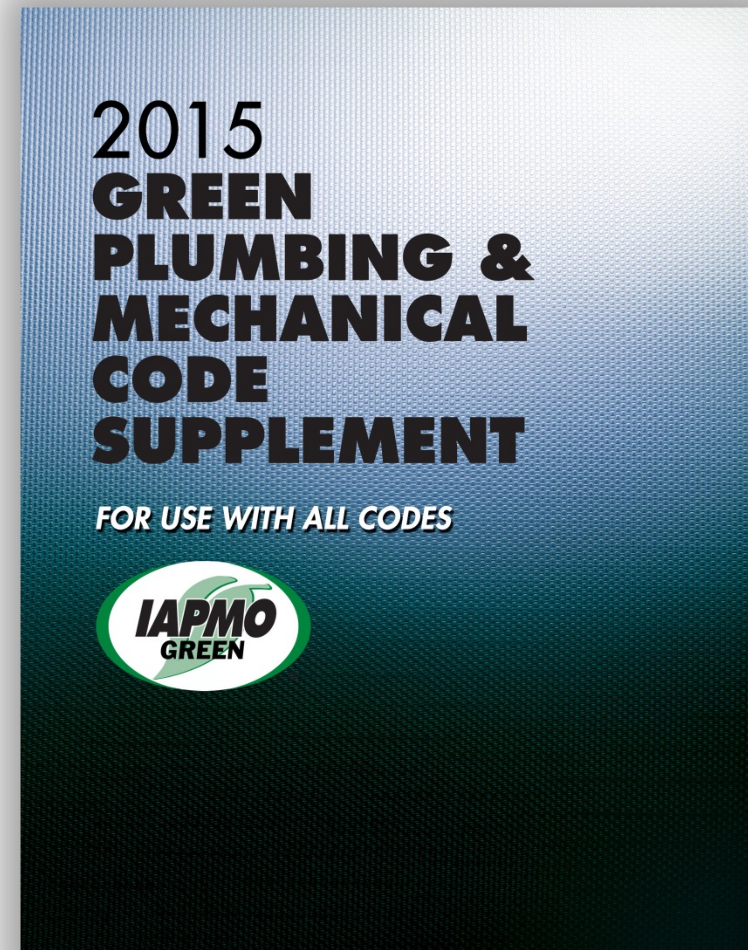
From WEStand Foreword…

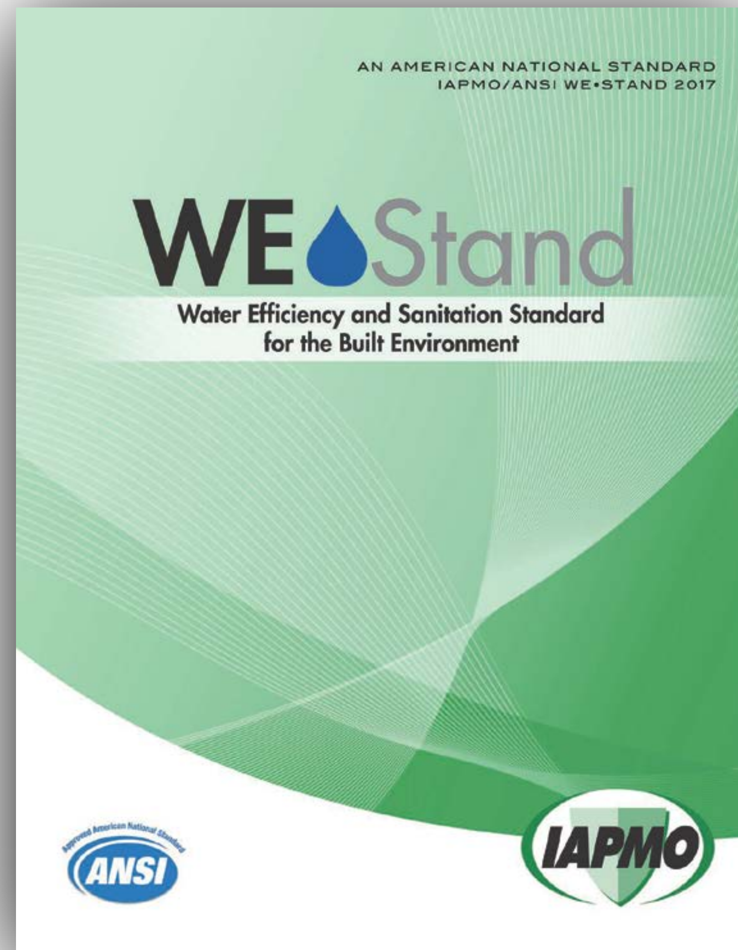
“With increasing demand, constrained infrastructure and supplies, and pervasive droughts globally, there is a critical need to reduce water consumption attributed to the built environment through conservation and reuse. With this comes increased risks to public health, safety, and building systems performance. This ANS would provide minimum requirements that optimize built environment water use practices and corresponding provisions that maintain protection to public health, safety, and welfare.

The purpose of this standard is to provide minimum requirements to optimize water use practices attributed to the built environment while maintaining protection of the public health, safety, and welfare.

WEStand applies to both residential and commercial construction.”

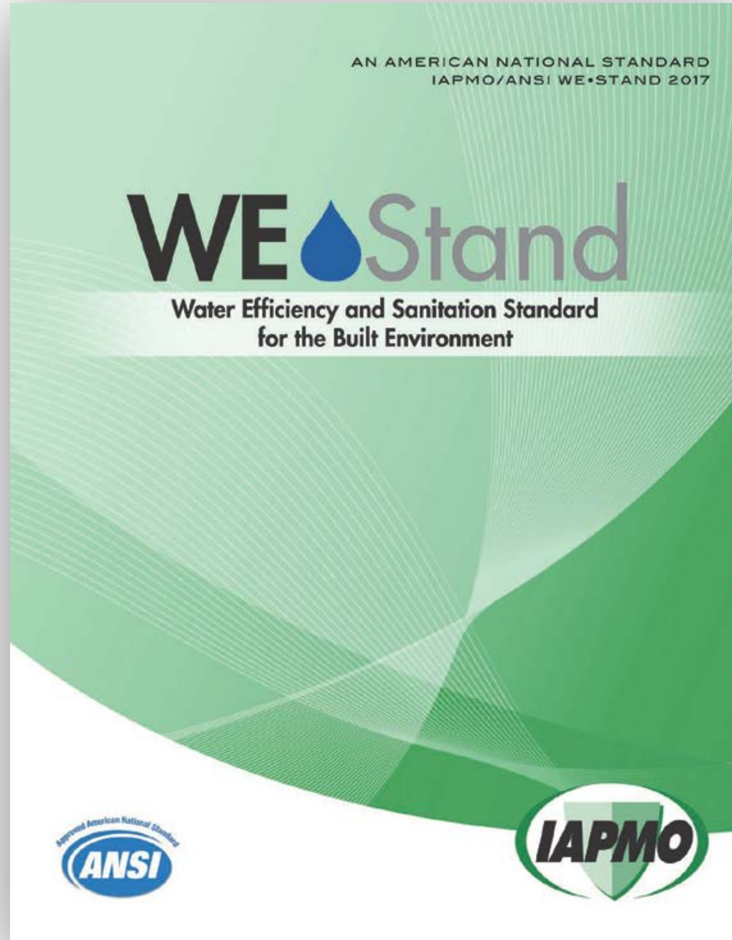
WE💧Stand replaced the IAPMO GPMCS





Why did IAPMO Develop WE•Stand?

- Fills a need for an American National Standard that focuses solely on Water Efficiency
  - Water is apolitical compared to energy
- Publication as a standard allows for multiple means of adoption by States and municipalities
- Allows for bringing together the best minds in the plumbing and water efficiency industries to develop a robust and comprehensive standard providing for efficiency, safety and system performance



Organization of WE💧Stand

- Executive Committee
- IAPMO CEO, Exec VP of Business Strategy, and Exec VP of Advocacy and Research who govern the Technical Committee
- Secretariat
- Maintains records and roster, publishes reports, oversees compliance with Regulations
- Technical Committee
- Responsible for developing the WE💧Stand. Needs to be balanced by interest categories per ANSI regs
- Task Groups
- Created by the TC to address specific topics or problems.
- Technical Correlating Committee
- Responsible to resolve conflicts between construction codes, correcting errors and omissions

Two Stages of Development

1. Proposal Stage
   a) Call for submission and publication of proposals
   b) Open meeting for TC actions on the proposals
   c) Letter Ballot affirmation on TC actions
   d) Publication of the Report on Proposals (we're here in the 2020 cycle)
2. Comment Stage
   a) Call for public comments on TC actions in the ROP
   b) Open meeting for TC actions on the public comments
   c) Letter ballot affirmation on TC actions
   d) Publication of the Report on Comments

2020 WE•Stand Development Timeline

WE•Stand Development Timeline for 2020 Cycle

October 16 2017	Call for TC Applications (45 days)
March 27, 2018 or March 29, 2018	WE•Stand Development Process via Go-to-Meeting Teleconference
October, 2018 – February, 2019	Task Group Activity
October 1, 2018	Call for Proposals
January 29, 2019	Deadline for Submission of Proposals
March 1, 2019	Distribution of Proposals to Committee (Proposal Monograph)
April 9-10, 2019 April	Technical Committee Meetings
25, 2019	Initial Ballot to Technical Committee
May 9, 2019	Receipt of Initial Ballots and Circulation of Comments
May 23, 2019	Final Closing Date for Ballots and Includes Receipt of Vote Changes Based on Re-Circulated Comments
July 25, 2019	Distribution of *Report on Proposals (ROP)*
August 29, 2019	Call for Public Comments
November 28, 2019	Deadline for Submission of Public Comments
February 27, 2020	Distribution of Public Comments to Committee (Public Comment Monograph)
March 24-25, 2020	Technical Committee Meetings
April 17, 2020	Initial Ballots to Technical Committees
May 1, 2020	Receipt of Initial Ballots and Circulation of Comments
May 15, 2020	Final closing date for ballots, including receipt of vote changes based on re-circulated comments
July 15, 2020	Distribution of *Report on Comments (ROC)*
September 29, 2020	Deadline for Notification of Intent to File Written Petition to the Executive Committee
November 12-13, 2020	Executive Committee Meet to Address Petitions

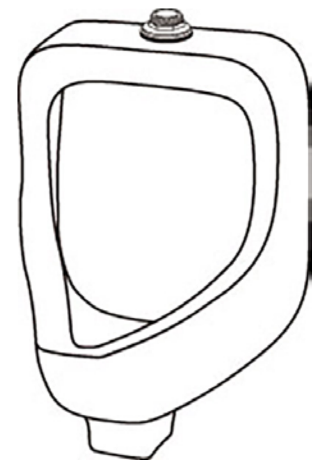
WE Stand at a Glance

- Administration
- Definitions
- General Regulations
- Water Efficiency and Conservation
- Alternate Water Sources for Nonpotable Applications
- Nonpotable Rainwater Catchment Systems
- Water Heating Design, Equipment and Installation
- Installer Qualifications
- Referenced Standards
- Appendices
    - A. Potable Rainwater Catchment Systems
    - B. Vacuum Drainage Systems
    - C. Peak Water Demand Calculator

Water Efficiency and Conservation
- Fixtures -

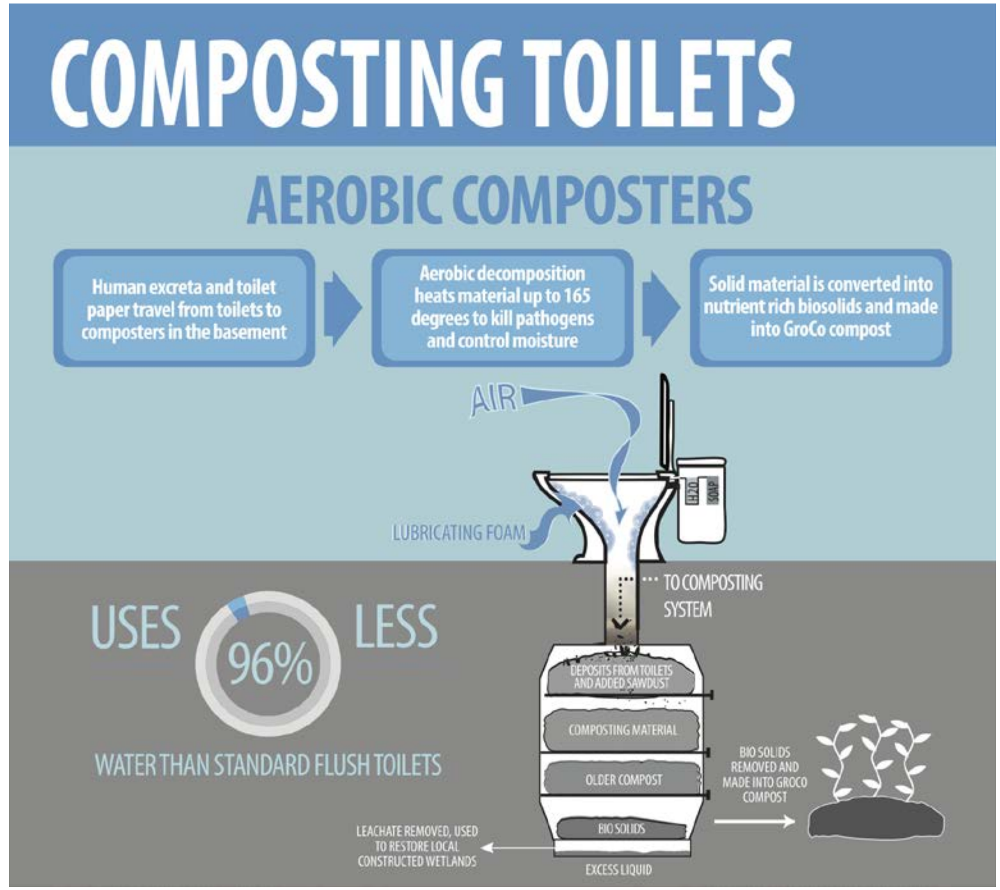
TABLE 402.1 MAXIMUM FIXTURE AND FIXTURE FITTINGS FLOW RATES	
FIXTURE TYPE	**FLOW RATE**
Showerheads	2.0 gpm @ 80 psi[1]
Kitchen faucets residential[4]	1.8 gpm @ 60 psi
Lavatory faucets residential	1.5 gpm @ 60 psi
Lavatory faucets other than residential	0.5 gpm @ 60 psi
Metering faucets	0.25 gallons/cycle
Metering faucets for wash fountains	One (1) 0.25 gal per cycle fixture fitting for each 20 inches rim space
Wash fountains	One (1) 2.2 gpm @ 60 psi fixture fitting for each 20 inches rim space
Water Closets	1.28 gallons/flush[2]
Urinals	0.5 gallons/flush[3]
Commercial Pre-Rinse Spray Valves	1.3 gpm @ 60 psi

[1] For multiple showerheads serving one shower compartment see Section 402.6.1
[2] Shall also be listed to EPA WaterSense Tank-Type High Efficiency Toilet Specification.
[3] Shall also be listed to EPA WaterSense Flushing Urinal Specification. Nonwater urinals shall meet the specifications listed in Section 402.3.1. [4] See Section 402.4.



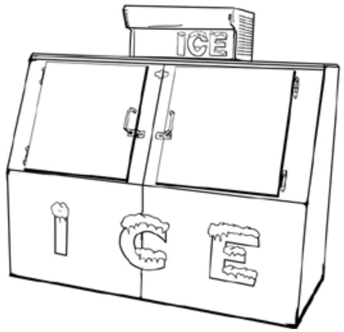
- Composting Toilet and Urine Diversion Systems -

Urine Diversion Toilet



Alternative Design Systems

- Commercial Food Services -



> 20 gal. water per 100 lbs cubed ice

Icemakers

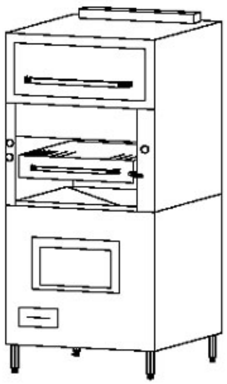
Pre-rinse Spray Valves

Combination Ovens

Dipper Wells

Food Steamers

Food Waste Disposers



0.5 gal. per hour per oven cavity

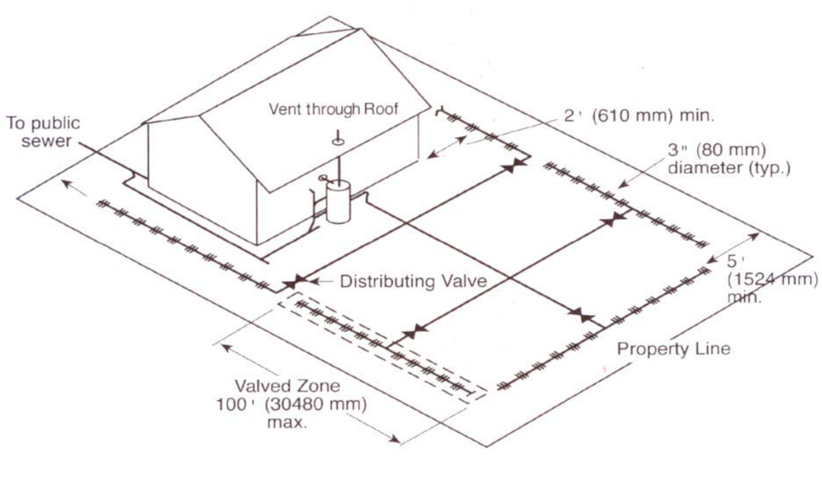
1.28 gpm

0.2 gpm

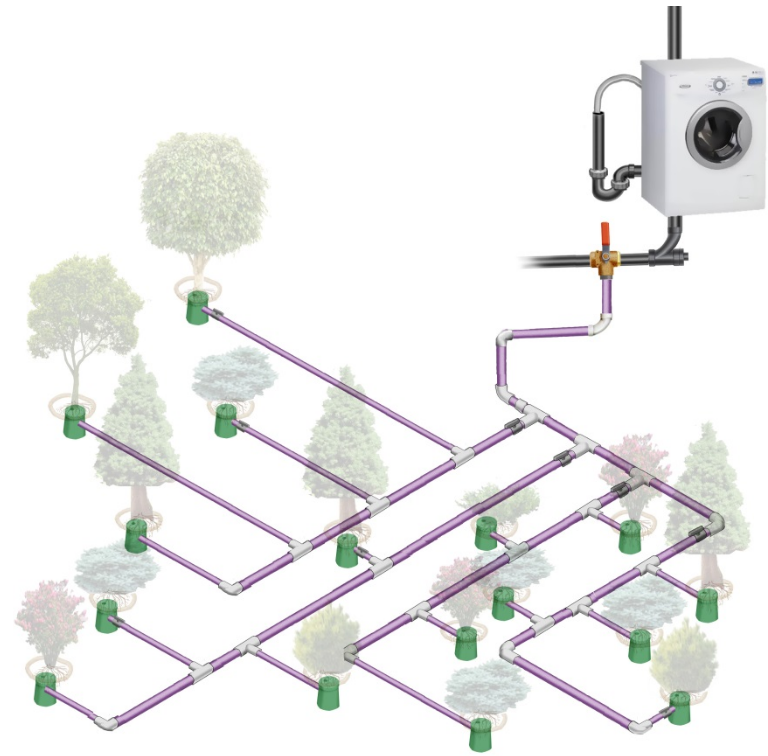
- Landscape Irrigation -

- EPA WaterSense Weather Based Controllers
- On-site sensors
- Low flow irrigation emitters
- Pressure regulated sprinkler spray heads

Alternate Water Sources
- Gray Water Systems -



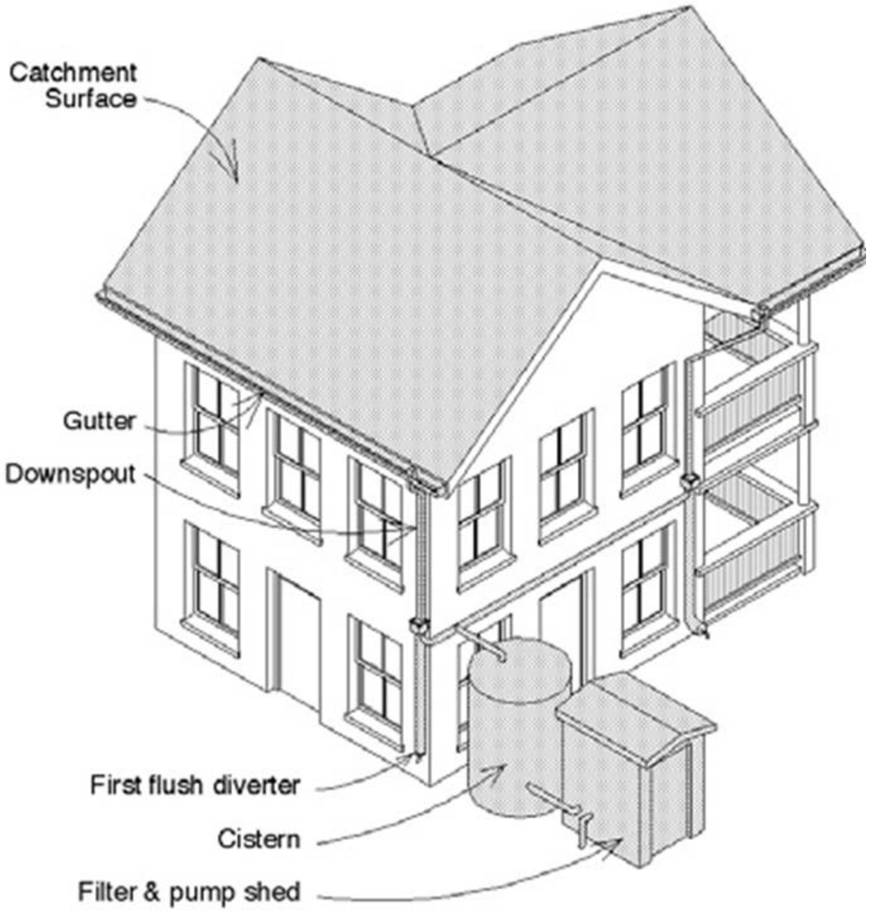
Subsoil Irrigation



Mulch Basins

- On-site Treated Nonpotable Water Systems -

- Rainwater Catchment Systems -



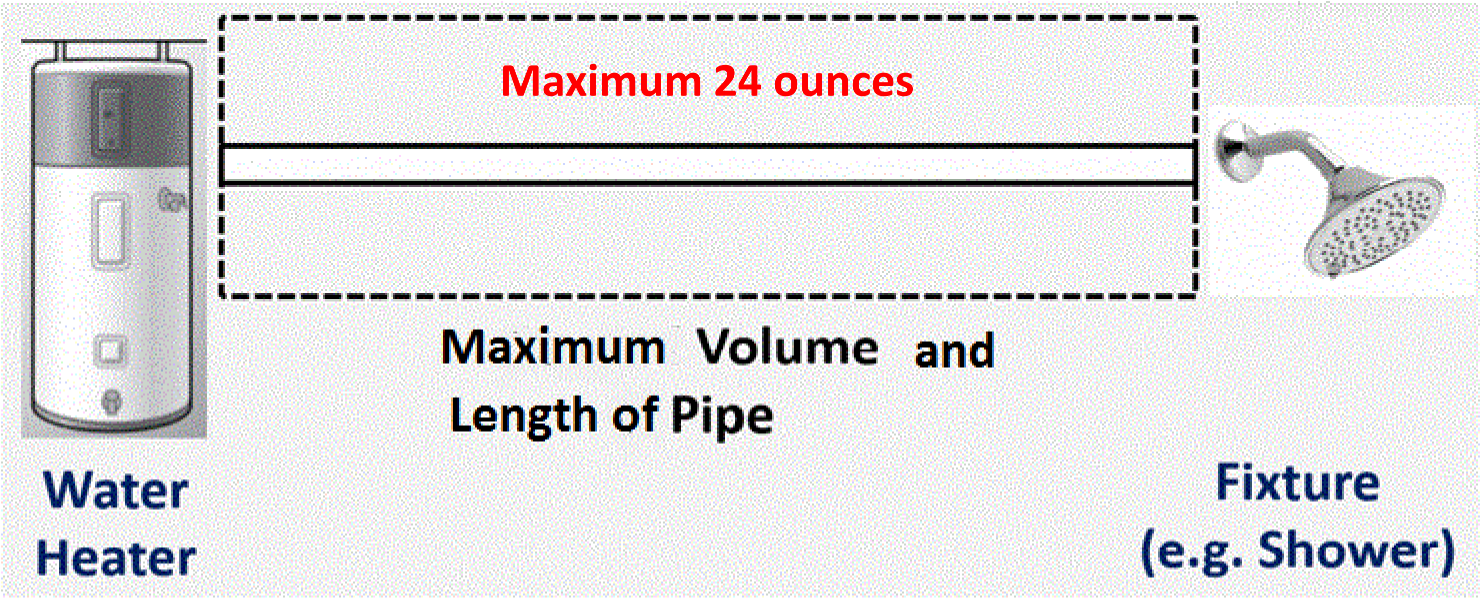
Nonpotable Applications

- Water closets
- Urinals
- Trap primers
- Irrigation
- Water features

Potable Applications

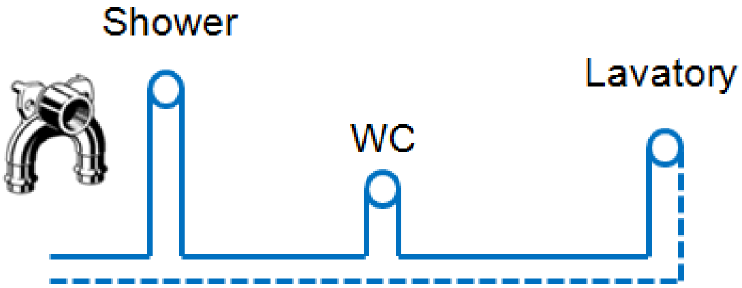
- Drinking
- Bathing
- Cooking

Water Heating Design



Water Heating Design
- Flow-through Design -

Series Branch - Maximum 40 oz/ft of pipe from water heater

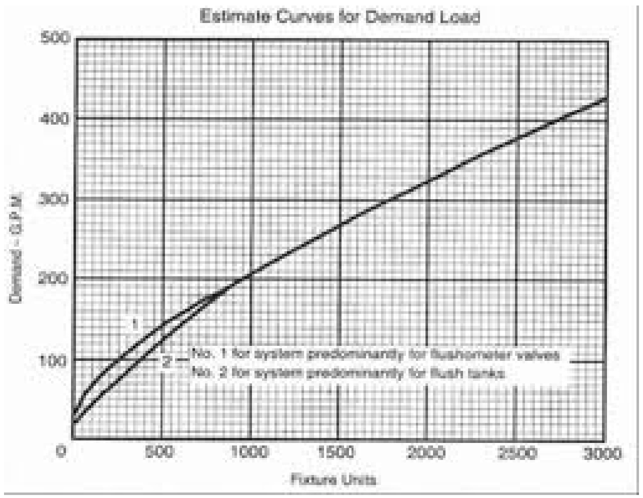


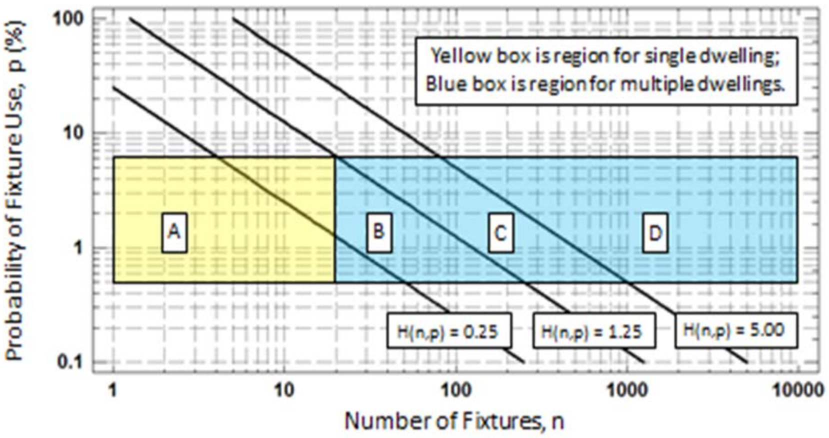
Series Ring - Maximum 60 oz/ft of pipe from water heater

Water Demand Calculator

- Resolves the excessive over-design of the plumbing system when applying the Hunter method
- Corrected the assumption of congested use of plumbing fixtures built in the Hunter method
- Improved the computational model to account for the high probability of no-flow condition in single- and multi-family dwellings.
- End use of water data provided the observation of peak hour of water use to derive the probability of fixture use.
- Developed four methods for estimating demand to account for the varying sizes of dwelling units.

Hunter's Curve





The Future of Residential Water Distribution and Sizing – Water Demand Calculator

Version 1.4 (March 2019)

Select Units

Monday, June 10, 2019 10:24 AM

PROJECT NAME : XXX-XXX

GPM | LPM | LPS

FIXTURE GROUPS		[A] FIXTURE	[B] ENTER NUMBER OF FIXTURES	[C] PROBABILITY OF USE (%)	[D] ENTER FIXTURE FLOW RATE (GPM)	[E] MAXIMUM RECOMMENDED FIXTURE FLOW RATE (GPM)
Bathroom Fixtures	1	Bathtub (no Shower)	0	1.0	5.5	5.5
	2	Bidet	0	1.0	2.0	2.0
	3	Combination Bath/Shower	2	5.5	5.5	5.5
	4	Faucet, Lavatory	4	2.0	1.5	1.5
	5	Shower, per head (no Bathtub)	0	4.5	2.0	2.0
	6	Water Closet, 1.28 GPF Gravity Tank	3	1.0	3.0	3.0
Kitchen Fixtures	7	Dishwasher	1	0.5	1.3	1.3
	8	Faucet, Kitchen Sink	1	2.0	2.2	2.2
Laundry Room Fixtures	9	Clothes Washer	1	5.5	3.5	3.5
	10	Faucet, Laundry	0	2.0	2.0	2.0
Bar/Prep Fixtures	11	Faucet, Bar Sink	0	2.0	1.5	1.5
Other Fixtures	12	Fixture 1	0	0.0	0.0	6.0
	13	Fixture 2	0	0.0	0.0	6.0
	14	Fixture 3	0	0.0	0.0	6.0

Total Number of Fixtures **12**

99th PERCENTILE DEMAND FLOW = 11.0 GPM

RESET

RUN WATER DEMAND CALCULATOR

Applying a new statistical-based method to safely reduce pipe diameters in homes reduces cost, improves both water and energy efficiency and helps to mitigate biofilm development in water pipes, improving water quality and the potential for opportunistic pathogens to grow.

The WE Stand Supporting Organizations

IAPMO

Alliance for Water Efficiency

ARCSA
American Rainwater Catchment Systems Association

ASPE
American Society of Plumbing Engineers™

Sanitary ASSE Engineering

GreenPlumbers®
Creating Sustainable Communities

APSP
The Association of Pool & Spa Professionals®

Water Quality Association

Plumbing Contractors of America
PCA

PPFA

PHCC
Plumbing-Heating-Cooling Contractors Association

World Plumbing Council

Plumbers • Union • Pipefitters • Service Techs • Steam Fitters • Sprinklerfitters
UA

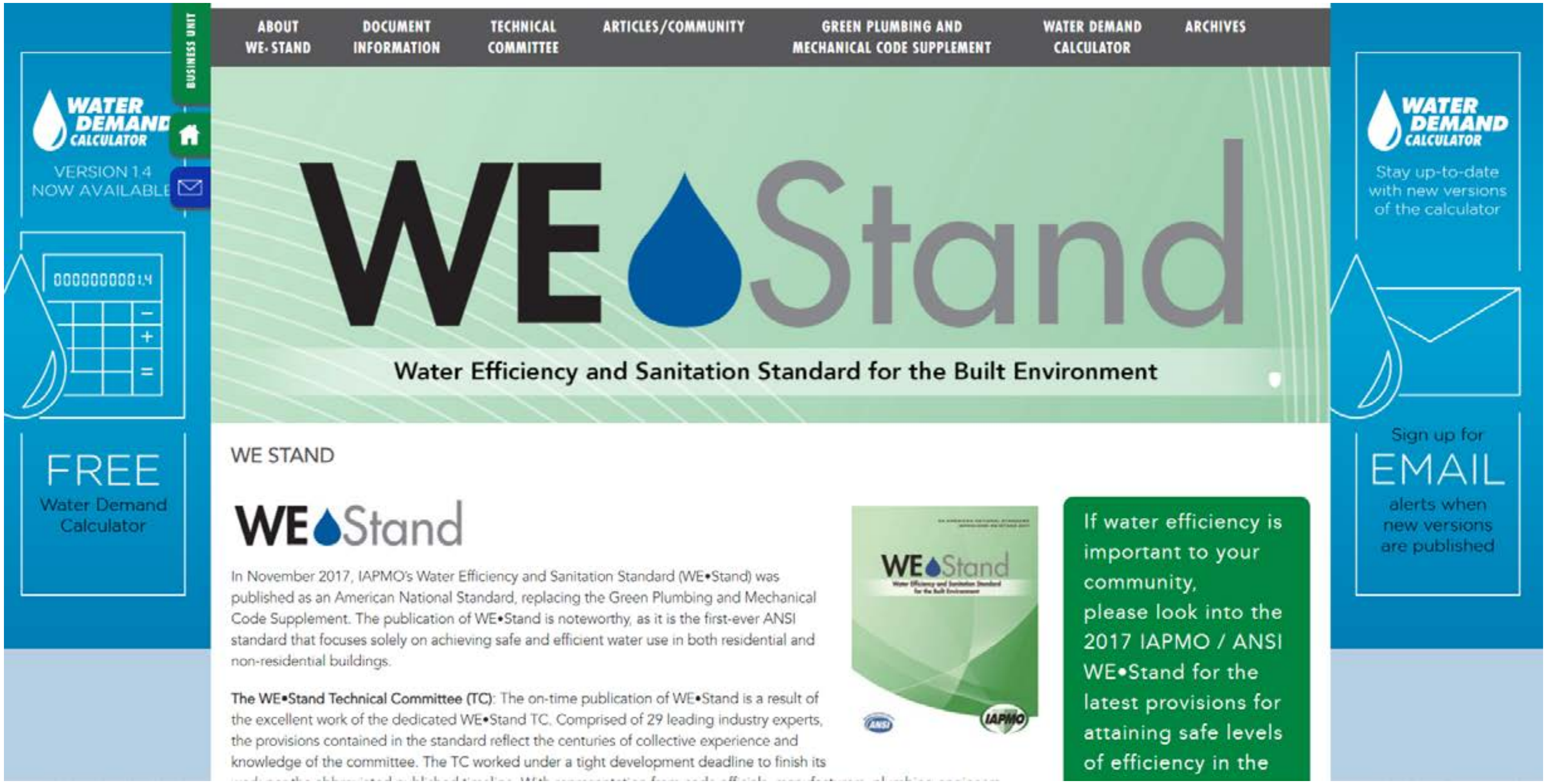
Irrigation Association®

pmi
Plumbing Manufacturers International™

WE•Stand Web Page

For more information visit

http://www.iapmo.org/we-stand#

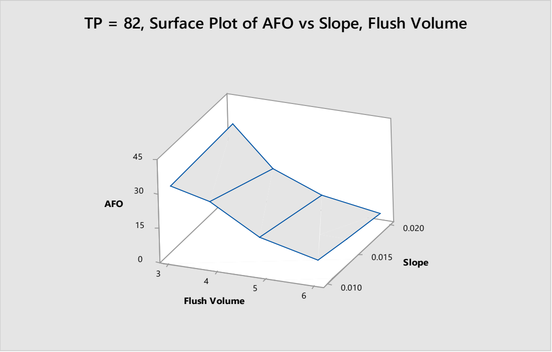


Plumbing Efficiency Research Coalition (PERC)

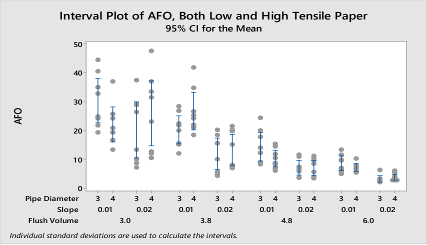
- Formed in January 2009 explicitly to address research pertaining to water efficiency
- MoU Signed at EPA HQ
- First Project: Drainline Transport
- MoU with Australia's AS-Flow in 2010

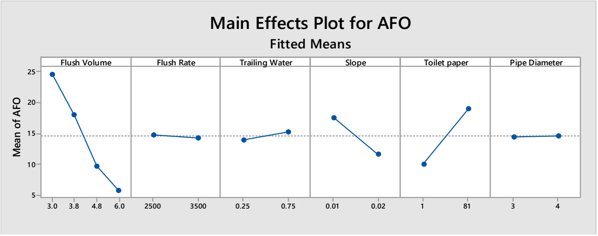
PERC's DLT Findings - Significance

- Determined potential for chronic drainline blockages at low volume toilet flush levels
- Measured the relative significance of drainline slope, diameter, toilet flush volume, toilet design and toilet paper tensile strength
- Found that there was no need to revise drainline sizing in the codes
- Much more!



Variable	P Value
Volume	0.000*
Flush Rate	0.472
Trailing Water	0.182
Slope	0.000*
Paper	0.000*
Pipe Diameter	0.533





To review the PERC studies, go to www.plumbingefficiencyresearchcoalition.org

Participation on ASHRAE 188 & Guideline 12

- IAPMO's prime directive is the codification of technical requirements for safe and efficient plumbing systems.
- Threats from Legionella and other opportunistic pathogens represent a major concern
- The only Code developing organization to have participated in the development of ASHRAE 188
- Provided needed expertise on pluming system design and operation

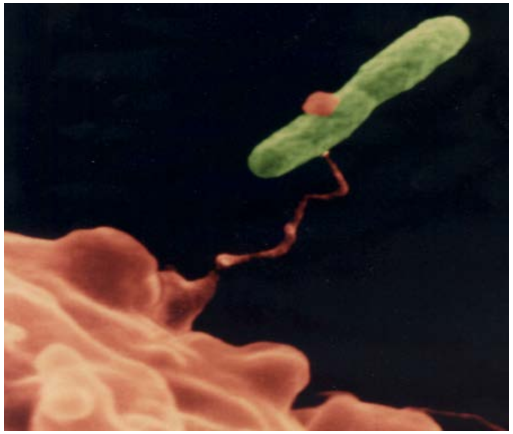


Photo courtesy of the CDC

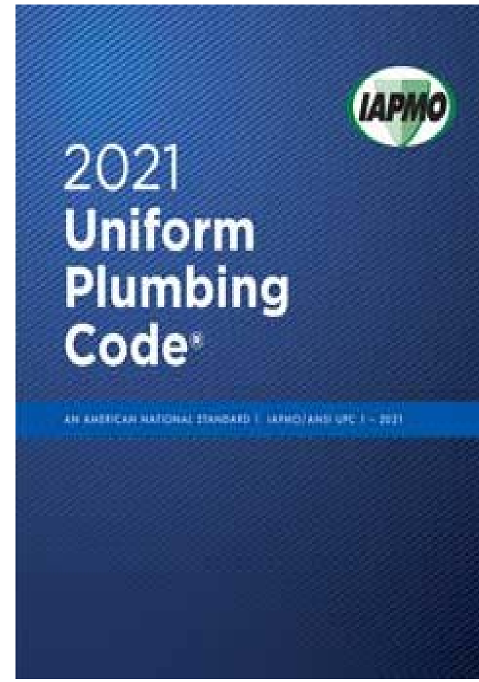
Legionella Task Group for the UPC

Need: ASHRAE 188 is complex and most provisions are non-enforceable by plumbing AHJ’s

Action: IAPMO issued a call for participation on a Legionella Task Group to develop enforceable provisions for the Uniform Plumbing Code

Task Group Results: The efforts of the Task Group resulted in the submission of three public comments Health Care Facility buildings. The UPC overwhelmingly accepted the best of the three submitted provisions.

Significance: Upon acceptance by the IAPMO voting membership at our conference, the UPC will be the first model code to include codified language on mitigating Legionella that is consistent with ASHRAE 188 and the soon to be updated ASHRAE Guideline 12.



The International Water, Sanitation and Hygiene Foundation

IWSH

Please visit www.iwsh.org and see how the plumbing industry is working together to bring piped water and sanitation solutions to people in need around the world!

The 7th Emerging Water Technology Symposium - May 12 - 13, 2020
San Antonio, TX

The American Society of Plumbing Engineers (ASPE), the Alliance for Water Efficiency (AWE), the International Association of Plumbing and Mechanical Officials (IAPMO), and Plumbing Manufacturers International (PMI), in cooperation with the World Plumbing Council (WPC), is proud to announce the convening of the seventh biennial Emerging Water Technology Symposium

Sponsors, presenters, and panelists participating in this symposium represented a diverse body of knowledge in the fields of water, sanitation and health, water and energy efficiency, water reuse, aging water infrastructure, water quality, mitigating opportunistic pathogens, advancements in mechanical systems, plumbing research initiatives, laws, regulations and policy development, interactive participation

THANK YOU!!