WATER EFFICIENCY AND SANITATION STANDARD (WE-STAND)

2016 REPORT ON PROPOSALS

WE●STAND TECHNICAL COMMITTEE
(as of 05/09/2016)

NAME	REPRESENTATION	INTEREST CATEGORY
Craig Selover, Chairman	Selover Consulting	Consumer
Jonathan Gray	Interface Engineering, Inc.	Design Professional
Gary Klein	Gary Klein & Associates	Design Professional
Rick Layton	Haines, Jones & Cadbury	Design Professional
Edward Saltzberg	Edward Saltzberg & Associates	Design Professional
Kyle Krause	CA Dept. of Housing and Community Development (HCD)	Enforcing Authority
Neal Shapiro	City of Santa Monica's Office of Sustainability & the Environment	Enforcing Authority
Sean Steffensen	California Energy Commission (CEC)	Enforcing Authority
Amir Tabakh	City of Los Angeles, LADWP	Enforcing Authority
Charles White	PHCC-National Association	Installer/Maintainer
John Ferruccio	Southern CA Pipe Trades DC 16	Labor
James Majerowicz	Plumbers Local 130	Labor
David Mann	California State Pipe Trades Council	Labor
Siying Chen	Masco Corp	Manufacturer
Shabbir Rawalpindiwala	Kohler Co.	Manufacturer
Matt Sigler	Plumbing Manufacturers International (PMI)	Manufacturer
Laura Allen	Greywater Action	Special Expert
David Fuente	The Water Institute at UNC	Special Expert
Bill Hoffman	HW (Bill) Hoffman and Associates	Special Expert
John Koeller	Koeller and Company	Special Expert
Brent Mecham	Irrigation Association	Special Expert
Thomas Pape	Alliance for Water Efficiency	Special Expert
Beverly Potts	Illinois PHCC	Special Expert
Billy Smith	American Society of Plumbing Engineers (ASPE)	Special Expert
Carvin DiGiovanni	Association of Pool & Spa Professionals (APSP)	User
Kent Sovocool	Southern Nevada Water Authority (SNWA)	User
Kevin Tindall	Tindall & Ranson Plumbing Heating & Air Conditioning	User
Eric Yeggy	Water Quality Association (WQA)	User

TO: IAPMO Members and Other Interested Parties

July 25, 2016

Following is the 2016 Water Efficiency and Sanitation Standard (WE-Stand) Report on Proposals (ROP). The WE-Stand Technical Committee met on April 5-6, 2016 in Ontario, California to review all public proposals submitted and Task Group recommendations. Task Group recommendations that were approved at the TC meeting became TC Proposals and moved forward for balloting.

Task Group recommendations that were not approved to move forward as TC proposals or were remanded back to the Task Group for further review were not balloted by the TC and therefore do not appear in the ROP. (Task Group recommendations not approved as TC proposals and balloted were item numbers 004, 005, 006, 017, 018, 019, 020, 041, 043, 045, 047, 048, 051, 052, 053, 071, 072, 073, 074, 075, 077, 078, 079, 080, 081, 082, 083, 084, 085, 095, 119, 122, 123, 124, 125, 132, 147, 163.)

All comments for consideration by the Technical Committee should be submitted to IAPMO electronically from August 29 – November 28, 2016. The online submittal form can be found starting August 29 at: http://www.iapmo.org/WEStand/Pages/DocumentInformation.aspx.

On March 28-29, 2017, the Technical Committee will meet to consider all the comments received in response to the actions contained within the ROP for the WE-Stand and will vote on whether to modify any of their previous actions.

TABLE OF CONTENTS

**Missing Item #’s were Task Group Recommendations

Item #	Code Section	Page #
066	414.12	62
067	414.12	64
069	414.13	67
086	501.2	68
087	501.3	69
088	501.3.1	70
089	501.5	72
090	Table 501.5	73
091	501.5.1	74
092	501.5.2	75
093	501.6	76
094	501.7	77
096	501.8	78
097	501.10	79
098	501.11	80
099	501.11.2.2	81
100	502.1.2-502.1.2.3	82
101	502.2.1	84
102	502.2.3	85
103	502.2.3	86
104	502.3	88
105	502.7	89
106	502.8.1	90
107	502.9.1	92
108	502.9.2	93
109	502.9.7	94
110	Table 502.10	95
111	502.10.3	97
112	502.11.1.1	98
113	502.11.1.2	99
114	502.11.1.3	100
115	502.11.1.5	101
116	502.11.1.6	102
117	502.11.2.1	103
118	502.11.2.3	104
121	503.5	105
126	601.1, 603.0-608.0, Tables 603.4.1, 606.2.1, 606.2.3	106
127	601.2	113
128	601.3	115
129	601.5.2	116
130	601.7	118
131	602.4	119
133	602.9.2	120
134	602.9.3.3	121
135	602.9.4	122
136	602.9.4.1	123
137	602.11.1	124
138	602.11.2	125

**Missing Item #'s were Task Group Recommendations

Item #	Code Section	Page #
139	602.11.2.1	126
140	602.11.2.2	127
141	602.11.2.4	128
142	702.6	130
143	702.7.1	131
144	703.4.5.2	133
145	703.4.5.2	134
146	704.1	135
148	Table 901.1	136
149	Table 901.1	137
150	Table 901.1	138
151	Table 901.1	139
152	Table A 101.5.1	140
153	A 101.5.2	142
154	A 101.7	143
155	A 103.2, A 104.5.1, Table 901.1	144
156	Table A 104.2.1	146
157	A 104.2.3	147
158	Table A 104.2.3	148
159	A 104.3.1	149
160	A 104.6	150
161	B 101.1-B 101.4	151
162	Appendix C, Table 901.1	154
TC #1	206.0 (Monograph Item #008)	156
TC #2	206.0 (Monograph Item #009)	157
TC #3	221.0 (Monograph Item #022)	158
TC #4	221.0 (Monograph Item #023)	159
TC #5	414.12 (Monograph Item #068)	160
TC #6	414.X (Monograph Item #070)	162
TC #7	417.5 (Monograph Item #076)	163
TC #8	206.0	164
TC #9	Appendix X (Monograph Item #164)	165
TC #10	503.1 (Monograph Item #120)	172
TC #11	411.3, 205.0	173

**Missing Item #'s were Task Group Recommendations

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	101.4
Proposed Text:	**101.4 Scope.** The provisions of this standard ~~applies~~ apply to the erection, installation, alteration, repair, relocation, replacement, addition to, use, or maintenance of plumbing and mechanical systems covered by the scope of this standard ~~within this jurisdiction~~.
Problem Statement:	•Grammatical correction to replace 'applies' with 'apply.' •Strike out 'within this jurisdiction' as the context is inconsistent. Throughout the text, the Authority Having Jurisdiction is referred to as a third party whereas in Section 101.4 it is used in the context that the jurisdiction and the standard are one in the same.
Referenced Standards:	

TC ACTION:
Accept as Amended:

101.4 Scope. The provisions of this standard shall apply to the erection, installation, alteration, repair, relocation, replacement, addition to, use, or maintenance of plumbing and mechanical systems covered by the scope of this standard within this jurisdiction.

TC SUBSTANTIATION:
To correlate with UPC.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
PAPE: It is unnecessary to correlate to the UPC, when the UPC is wrong. This should be fixed in the UPC.

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	101.4.2
Proposed Text:	**101.4.2 Existing Construction.** No provision of this standard shall be deemed to require a change in any portion of a plumbing or mechanical system or any other work regulated by this standard in or on an existing building or lot when such work was installed and is maintained in accordance with law in effect prior to the effective date of this standard, except when any such plumbing or mechanical system is determined by the Authority Having Jurisdiction to be ~~in fact~~ dangerous, unsafe, insanitary, a nuisance or a menace to life, health, or property.
Problem Statement:	•Unnecessary. The Authority Having Jurisdiction should have the ability to determine and make these judgments, with or without the details that define the term 'in fact.'
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
KRAUSE: Suggest changing the word "law" to "code."
SALTZBERG: This item may need a clarification as to what constitutes "dangerous."

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	101.6
Proposed Text:	**101.6 Referenced Codes and Standards.** The codes and standards referenced ~~elsewhere~~ in this standard shall be considered part of the requirements of this standard to the prescribed extent of each such reference.
Problem Statement:	- Not necessary as it assume everything hereafter will be referenced to and doesn't include anything prior to Section 101.6.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Tim Keane
Organization:	Legionella Risk Management, Inc.
Recommendation:	Revise text
Section Number:	205.0
Proposed Text:	**205.0** **Cycles of Concentration for Cooling Towers.** Cycles of concentration represents the increasing amount of minerals in solution that occur through evaporation in proportion to the minerals in solution contained in the original makeup water. Cycles of concentration can be calculated by ~~equals~~ the specific conductance of the water in the cooling tower basin divided by the combined flow weighted average specific conductance of the makeup water(s) to the cooling tower.
Problem Statement:	The present wording is not a definition, it is a calculation. This wording revision adds the definition to the calculation.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Proposed definition is unclear. Request proponent to amend definition during call for comment period.
Cycles of Concentration appears to be an antiquated method.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NOT RETURNED: 3 Gray, Saltzberg, Tabakh

Name:	Gary Morgan
Organization:	Viega LLC
Recommendation:	Add text
Section Number:	208.0
Proposed Text:	**208.0** **Flow-Through Fitting**: A multiport piping connection that has two primary piping supply connections and one outlet connection with the purpose to supply water (hot or cold) to an end use plumbing fixture. The design of a flow-through fitting allows for non-restricted water to constantly flow through the fitting regardless if there is demand from the end use fixture or not. Flow-through fittings are typically used in order to keep water from cooling or stagnating as is otherwise typical in a traditional branch legs serving individual fixtures. When properly integrated into hot-water recirculation systems the wait time for hot-water is minimized thus saving both water and energy.
Problem Statement:	Add new definition for flow-through fittings.The term "Flow-through fitting" is being introduced in separate code proposals as an addition to section 702.7.1.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Not required, term not used in document.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
HOFFMAN: Not required, term not used in document.
SIGLER: This proposal and Item #143 outline a truly efficient method for delivering hot water. I would encourage the proponent to submit additional technical data, during the public comment stage, to further substantiate these proposals.

Name:	Tim Keane
Organization:	Legionella Risk Management, Inc.
Recommendation:	Add text
Section Number:	210.0
Proposed Text:	**210.0** **High Use Public Facility Restrooms.** Public lavatory faucets are those intended for the unrestricted use of more than one individual in assembly occupancies, business occupancies, public buildings, transportations facilities, etc.
Problem Statement:	Low use public restroom with low temperature and low flow are a huge risk for Legionella colonization. EPA NAECA provided for information
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATON:
Not required, term not used in document.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
KRAUSE: Term not used in document.

EXPLANATION OF NEGATIVE:
HOFFMAN: Term not used in document and not needed.
SALTZBERG: I believe that this definition is useful.

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	214.0
Proposed Text:	**214.0** **Lavatory Faucet**. A faucet that discharges into a lavatory ~~basin~~ in a domestic or commercial installation.
Problem Statement:	Consistency with the definition of 'Lavatory' in 214.0 requires the term 'basin' to be removed as exclusion of a vessel is otherwise implied.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

<table>
<tr><td>Name:</td><td>Josh Jacobs</td></tr>
<tr><td>Organization:</td><td>UL</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Recommendation:</td><td>Revise text</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Section Number:</td><td>214.0, Table 901.1</td></tr>
<tr><td>Proposed Text:</td><td>214.0

Listed (Third-party Certified). Equipment or materials included in a list published by a listing agency (~~accredited~~ conformity assessment body which has the required standard in their ISO 17065 scope of accreditation) that maintains periodic inspection on current production of listed equipment or materials and whose listing states either that the equipment or material complies with approved standards or has been tested and found suitable for use in a specified manner. ~~[UPC:214.0]~~

Table 901.1
Referenced Standards
<table><tr><th>STANDARD NUMBER-YEAR</th><th>STANDARD TITLE</th><th>REFERENCED SECTION</th></tr><tr><td>ISO 17065-2012</td><td>Conformity assessment -- Requirements for bodies certifying products, processes and services</td><td>214.0</td></tr></table>
(portions of table not shown remain unchanged)</td></tr>
<tr><td>Problem Statement:</td><td>In this definition, the verbiage 'accredited conformity assessment body' is used. My concern is that it is never stated what the assessment body is being accredited to or by or gives any direction. ISO 17065-2012 Conformity assessment -- Requirements for bodies certifying products, processes and services is a standard that is being used by reputable certification and assessment organizations around the world to show that they know how to do the third-party assessments that they say they are doing. Many authorities having jurisdictions also are utilizing this as a way to find reputable third-party certification organizations.</td></tr>
<tr><td>Referenced Standards:</td><td>http://www.iso.org/iso/catalogue_detail?csnumber=46568</td></tr>
</table>

Note: ISO/IEC 17025 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

Staff note: An electronic copy will be forthcoming or a hard copy will be available to the WE-Stand Technical Committee for review at the April 4-5, 2016 WE-Stand TC Meeting.

TC ACTION:
Reject

TC SUBSTANTIATION:
Existing UPC language is preferred.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Kelsey Jacquard
Organization:	Hunter Industries
Recommendation:	Revise text
Section Number:	214.0
Proposed Text:	**214.0** **Low Flow Emitter.** Low flow irrigation emission device designed to dissipate water pressure and discharge a small uniform flow or trickle of water at a constant flow rate. To be classified as a Low Flow Emitter: drip emitters shall discharge water at less than ~~4 gallons (15 L)~~ 6.3 gallons (24 L) per hour per emitter; micro- spray, micro-jet and misters shall discharge water at a maximum of 30 gallons (113 L) per hour per nozzle.
Problem Statement:	It is recommended to change the maximum flow for drip emitters from 4 GPH to 6.3 GPH to match the ASABE/ICC 802-2014 definition of a drip emitter.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 22, NEGATIVE: 4, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
MECHAM: 6.3 gph or 24L/h is the maximum flow rate an emitter can have to be classified as a drip emitter. It is consistent with ASABE/ICC 802 standard and is consistent with ISO 9261, which defines the maximum flow rate for an emitter of 24 L/h. The idea of a standardized definition is to help improve communication by affected parties.

EXPLANATION OF NEGATIVE:
ALLEN: I agree with Tom Pape's comment.
KRAUSE: Agree with Mr. Pape, and also this proposed change is to align with ASABE/ICC definition of drip emitter, not low flow emitter, not justified.
MANN: I agree with Tom Pape's statement.
PAPE: Improved water efficiency was not claimed, nor was any evidence provided that 6.3 GPH was superior to 4 GPH. There is no evidence presented that assert using the same definition of ASABE/ICC 802-2014 improves water use efficiency.

<table>
<tr><td>Name:</td><td>Natalia Larrimer</td></tr>
<tr><td>Organization:</td><td>ANAB</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Recommendation:</td><td>Add text</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Section Number:</td><td>214.0, Table 901.1</td></tr>
<tr><td>Proposed Text:</td><td>214.0

<u>Testing Facilities.</u> <u>Testing laboratories accredited to the requirements of ISO/IEC 17025 - General requirements for the competence of testing and calibration laboratories for the scope of testing required. The accrediting body must be recognized for scope of testing by the Inter-Laboratory Accreditation Cooperation (ILAC).</u>

<table>
<tr><th colspan="3">Table 901.1
Referenced Standards</th></tr>
<tr><th>STANDARD NUMBER-YEAR</th><th>STANDARD TITLE</th><th>REFERENCED SECTION</th></tr>
<tr><td><u>ISO 17025-2005</u></td><td><u>General requirements for the competence of testing and calibration laboratories</u></td><td><u>214.0</u></td></tr>
</table>

(portions of table not shown remain unchanged)</td></tr>
<tr><td>Problem Statement:</td><td>ILAC Signatory Accreditation bodies are evaluated to the internationally accepted criteria specific for international recognition to assess factors relevant to a laboratory's ability to produce precise, accurate test and calibration data. Recognized Accreditation uses criteria and procedures specifically developed to determine technical competence. Specialist technical assessors conduct a thorough evaluation of all factors technical and process that have an impact on the end result. To ensure continued compliance, accredited laboratories are regularly re-examined to verify that they are maintaining standards of operation and technical expertise. These laboratories may also be required to participate in regular proficiency testing programs as an on-going demonstration of their competence. Only recognized oversight such as accreditation could provide assurance that organization indeed meets this specific set of requirements and is technically competent for the scope granted.</td></tr>
<tr><td>Referenced Standards:</td><td>The referenced ISO/IEC 17025 standard is being provided via hard copy as it is subject to copy right laws. ANAB are legally not allowed to distribute any copies. A summary is available under the following link https://www.iso.org/obp/ui/#iso:std:iso-iec:17025:ed-2:v1:en</td></tr>
</table>

Note: ISO/IEC 17025 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

Staff note: Paper copy of the ISO 17025 will be available to the WE-Stand Technical Committee for review at the April 4-5, 2016 WE-Stand TC Meeting.

TC ACTION:
Reject

TC SUBSTANTIATION:
Second sentence is hard to understand as accredited bodies are not recognized for scope of testing; they accredit the scope of testing. In violation of manual of style because of mandatory language in definition.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	215.0
Proposed Text:	**215.0** **Multi-Occupant Spaces.** Indoor spaces used as a place of congregation for activities such as ~~for~~ presentations and training, including classrooms and conference rooms.
Problem Statement:	• The definition limits the use of the space for only two purposes and excludes usage of the space for similar activities, such a meetings. • The additional verbiage will expand the usage opportunities for the space without encroaching into the general definition of an assembly.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Neal Shapiro
Organization:	City of Santa Monica
Representing:	Office of Sustainability & the Environment
Recommendation:	Revise text
Section Number:	220.0
Proposed Text:	**220.0** **Rainwater.** Natural precipitation that ~~has contacted a rooftop or other~~ lands on a man-made, impervious above ground surface and can be collected on-site for beneficial uses. **Rainwater Catchment System.** A system that collects and stores rainwater for the intended purpose of beneficial use. Also known as RainwWater Harvesting System.
Problem Statement:	Clean up and make more accurate, describe better, these definitions. Make Rainwater and Stormwater more consistent between each since same water resource, precipitation, just varies on where it lands (for some) versus where it flows (more accurate).
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 23, NEGATIVE: 2, NOT RETURNED: 3 Gray, Saltzberg, Tabakh

EXPLANATION OF NEGATIVE:
MANN: This is at best, the worst code language I have read in a very long time. There is a definition in the 2015 UPC and I would suggest we use that definition.
RAWALPINDIWALA: We agree with Dave Mann to keep the definition consistent with what is in the UPC.

Name:	Tim Keane
Organization:	Legionella Risk Management, Inc.
Recommendation:	Add text
Section Number:	402.0
Proposed Text:	**402.0 Plumbing Systems.** **402.1 Plumbing Systems Design.** Plans shall minimize pipe lengths by arranging water using fixtures as close as practical to keep plumbing in interstitial spaces to a minimum as follows: (1) Fixtures in the same room shall be located on the same wall where possible to allow series connections of adjacent components eliminating as many individual drop legs as possible. (2) Fixtures in adjacent rooms shall be located back to back where possible. (renumber remaining sections)
Problem Statement:	Add a new section 402.0 after 401.1 and renumber all following sections accordingly with, for example, water conserving plumbing fixtures and fittings becoming section 403.0, etc. The growing rate of opportunistic pathogen outbreaks in plumbing systems is simple math. When average pipe diameters (a) are constant and the total amount of pipe lengths in a building (b) are constant in most buildings and increasing dramatically in health care facilities due to many more sinks and showers (4b) and the water use (z) is cut drastically by low flow restrictors then the math is clear the age of water stored in the building (c) is multiplied in proportion to the reduction in flow restriction 4X and increase in fixture count 4X in healthcare. This 4X to 16X or greater increase in water aging in a building water system directly impacts disinfectant residuals. This dramatic reduction in flow rates at fixtures directly impact water velocity in piping, and according this dramatic increase in water aging and decrease in water velocity results in dramatic increase in Legionella growth rate potential. Building designers need to locate rooms and fixtures to minimize piping as much as possible. They should also wherever possible use series pipe connections between adjacent fixtures to dramatically impact pipe runs. Plumbing designers alone cannot completely resolve this issue however codes should reinforce the need to this issue to be addressed. Trying to mandate water conservation by solely placing restrictors at the end of the line increases the need for flushing lines to drain to control bacteria growth. one study showed that flushing water at low flows through low flow restrictors required dramatic volumes of water and resulted in marginal impact in bacteria issues. The result of this study was installing high flow 1" solenoid valves for flushing to address bacterial issues caused by water aging.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Proposal is design restrictive. More information is required.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
MANN: There was no scientific justification submitted for the rationale statements. Only the proponent's feelings on the subject.

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	402.2
Proposed Text:	**402.2 Water Closets.** No water closet shall have a flush volume exceeding ~~1.6gallons (6.0 L)~~ 1.28 gallons per flush (gpf) (4.8 Lpf). **Exception:** Water closets shall not exceed 1.6 gallons (6.0 Lpf) of water per flush when installed in a remote location at least 30 feet (9144 mm) upstream of the nearest drain line connection or fixture, and where less than 1.5 drainage fixture units (dfu) are upstream of the water closet's drain line connection.
Problem Statement:	Consistency with the Standard's intent and structure obligates a 1.6 gpf water closet be removed from the main body of the text and relegated as an exception.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Current language does not prohibit the use of a 1.28 gpf. No evidence to show that the exception is needed.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
KRAUSE: High-efficiency toilets have been tested and listed. Additionally, there is no study or evidence that a water closet that is 5 feet, 20 feet, or 30 feet or more upstream of another drain line will not flow properly. The UPC provides the minimum slope for proper drainage of fixture drainage pipes. The standard should promote water efficiency.

WE-Stand 2017 – (402.2 – 402.2.2, Table 402.1, Table 901.1) Item # 026

Name:	John Koeller
Organization:	Koeller and Company
Recommendation:	Revise text
Section Number:	402.2-402.2.2 and Table 402.1, Table 901.1

Proposed Text:

402.2 Water Closets. No water closet shall have a flush volume exceeding ~~1.6 gallons (6.0 L)~~ 1.28 gallons (4.8 Lpf) per flush (gpf).

402.2.1 Gravity, Pressure Assisted and Electro-Hydraulic Tank Type Water Closets. Gravity, pressure assisted, and electro-hydraulic tank type water closets shall have a maximum effective flush volume of not more than 1.28 gallons (4.8 Lpf) of water per flush in accordance with ASME A112.19.2/CSA B45.1 or ASME A112.19.14 and shall also be listed to the EPA WaterSense Tank-Type High Efficiency Toilet Specification. The effective flush volume for dual-flush toilets is defined as the composite, average flush volume of one ~~two~~ reduced flush~~es~~ and one full flush.

402.2.2 Flushometer-Valve Activated Water Closets. Flushometer-valve activated water closets shall have a maximum flush volume of not more than ~~1.6 gallons (6.0 L)~~ 1.28 gallons (4.8 Lpf) of water per flush in accordance with ASME A112.19.2/CSA B45.1 and shall be listed to the EPA WaterSense®Specification for Flushometer-Valve Water Closets.

Table 402.1
MAXIMUM FIXTURE AND FIXTURE FITTINGS FLOW RATES

Water Closets ~~- other than remote locations~~[4]	1.28 gallons/flush
~~Water Closets - remote locations~~[4]	~~1.6 gallons/flush~~

[4] ~~Remote location is where a water closet is located at least 30 feet upstream of the nearest drain line connections or fixtures, and is located where less than 1.5 drainage fixture units are upstream of the water closet's drain line connection.~~

(renumber remaining footnotes)

TABLE 901.1
REFERENCED STANDARDS

STANDARD NUMBER-YEAR	STANDARD TITLE	REFERENCED SECTION
EPA WaterSense 2015	Specification for Flushometer-Valve Water Closets	402.2.2

(portions of tables not shown remain unchanged)

Problem Statement: The advancement of product and building design, the success of dual-flush toilets with a maximum full flush of 1.28 gpf, and the release of a WaterSense specification for labeling flushometer valve/bowl combination water closets makes adjustments to the flush volume requirements of this standard feasible. As proposed, the above revisions make this standard consistent with the provisions of ASHRAE SS189.1.

	Provided for reference: (1) a listing of MaP-tested dual-flush toilets that meet special criteria (including WaterSense and a 1.28 gallon maximum full flush and (2) a listing of flushometer valve/bowl combination water closets with a flush volume of 1.28 gpf or less.
Referenced Standards:	ASME A112.19.2/CSA B45.1; ASME A112.19.14; EPA WaterSense Specification for Flushometer-Valve Water Closets; EPA WaterSense Tank-Type High Efficiency Toilet Specification

Note: ASME A112.19.2/CSA B45.1 and ASME A112.19.14 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

Note: EPA WaterSense Specification for Flushometer Valve Water Closets and EPA WaterSense Tank-Type High Efficiency Toilet Specification was not developed via an open process having a published development procedure in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept as amended:

402.2 Water Closets. No water closet shall have an effective flush volume exceeding 1.28 gallons (4.8 Lpf) per flush (gpf).
402.2.1 Gravity, Pressure Assisted and Electro-Hydraulic Tank Type Water Closets. Gravity, pressure assisted, and electro-hydraulic tank type water closets shall have a maximum effective flush volume of not more than 1.28 gallons (4.8 Lpf) of water per flush in accordance with ASME A112.19.2/CSA B45.1 or ASME A112.19.14 and shall also be listed to the EPA WaterSense Tank-Type High Efficiency Toilet Specification. The effective flush volume for dual-flush toilets is defined as the composite, average flush volume of ~~one~~ two reduced flushes and one full flush.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 22, NEGATIVE: 4, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
HOFFMAN: See Tom Pape's comments. Follow AWE language.
KOELLER: Agree with the comments of Thomas Pape. The 'effective flush volume' (EFV) definition related to tank-type dual-flush toilets was adopted out of necessity for the WaterSense tank-type toilet specification around 2006. The average ratio of reduced flushes to full flushes was determined even before that (2003) on the basis of 4 studies in the U.S. and Canada.
In those 4 studies, the ratios widely varied from the 2.0 to 1.0 ratio subsequently adopted into WaterSense.
Seattle, 2000, residential: 0.8 to 1.0 (20 dwellings)
Oregon, SWEEP study, 2000, residential: 1.9 to 1.0 (50 dwellings)
Jordan Valley, Utah, 2003, residential: 1.48 to 1.0 (61 fixtures)
Ontario, Canada, 2002, commercial food service: 1.3 to 1.0
Ontario, Canada, 2002, commercial office: 1.7 to 1.0
Ontario, Canada, 2002, single-family residential: 1.6 to 1.0
Ontario, Canada, 2002, multi-family residential: 4.0 to 1.0
The Ontario study results shown above are represented by a total of 56 dual-flush toilets.

Because of the very limited breadth of the above work, manufacturers and most water-efficiency professionals agree today that these numbers are not really representative of today's 'real world.' Yet, out of necessity in 2006, WaterSense chose 2.0 to 1.0 as their preferred ratio for calculation of the EFV.
A great deal of debate has taken place in recent years over the ratio. Evidence has surfaced in the recent past that the ratio is much lower than 2.0 to 1.0. That is disputed. However, in 2014-15, ASHRAE's ANSI Standard 189.1 for high performance green buildings rid itself of the term EFV, calculation ratios, and the separation of dual-flush from single flush. They massively simplified the standard in this area; it now provides for a simple 1.28 gallon per flush maximum regardless of the toilet design. That is what was originally proposed here and is what is fully justified.
MANN: This is in conflict with the UPC. Also, EPA is a guideline and not an ANSI Standard.
PAPE: The "effective flush volume" was developed as a guess - that guess is proven to be grossly inaccurate in commercial settings. There are many many many HETs on the market that exceed all the performance tests and never flush more than 1.28. It is well known that in commercial settings the partial flush is seldom used. Essentially the toilets needing the "effective flush" loophole are ULFTs (1.6 GPF) masquerading as HETs in commercial settings. If it doesn't act like an HET, it’s not high efficiency.

WE-Stand 2017 – (402.2.2) Item # 027

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	402.2.2
Proposed Text:	**402.2.2 Flushometer-Valve Activated Water Closets**. Flushometer-valve activated water closets shall ~~have a maximum flush volume of not more than 1.6gallons (6.0 L) of water per flush in accordance~~ comply with ASME A112.19.2/CSA B45.1.
Problem Statement:	Consistency with the proposed change to Section 402.2, relegating the maximum consumption of 1.6gpf as an exception, obligates the removal of a specified flow rate as it otherwise becomes redundant and unclear.
Referenced Standards:	ASME A112.19.2/CSA B45.1

Note: ASME A112.19.2/CSA B45.1 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Reject

TC SUBSTANTIATION:
The committee prefers the action taken on item #026, which is more complete.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	John Koeller
Organization:	Koeller and Company
Recommendation:	Revise text
Section Number:	402.3
Proposed Text:	**402.3 Urinals**. Urinals shall have a maximum flush volume of not more than ~~0.5 gallon (1.9 L)~~ 0.25 gallon (0.9 L) of water ~~per flush~~ in accordance with ASME A112.19.2/CSA B45.1 or CSA B45.5/IAPMO Z124. Flushing urinals shall be listed to the EPA WaterSense Flushing Urinal Specification.
Problem Statement:	The reduction of urinal flush volumes for new construction is overdue. While the national product standard remains at 1.0 gpf, the WaterSense specification sets their voluntary maximum at 0.5 gpf. Furthermore, the State of California has set a new maximum at 0.125 gpf. While a reduction to the California threshold might be appropriate for that State, it is recommended that WE-Stand select a threshold below that of the WaterSense maximum, but not as low as California. A maximum of 0.25 gpf (1 quart of water) be selected. In the flushing urinal category as of January 22, 2016 (as illustrated in the attached MaP list of high-efficiency urinals), 132 different product models were offered in the U.S. marketplace, divided as follows: 0.25 gpf - 35 urinal models (of which 32 are WaterSense certified), 7 different brands 0.125 gpf - 97 urinal models (of which 90 are WaterSense certified), 19 different brands Ample product exists, sourced from a large number of manufacturers and brands. Provided for reference: MaP list of high-efficiency urinals and WaterSense specification for flushing urinals
Referenced Standards:	ASME A112.19.2/CSA B45.1 Ceramic Plumbing Fixtures; WaterSense Specification for Flushing Urinals; CSA B45.5/IAPMO Z124

Note: ASME A112.19.2/CSA B45.1 and CSA B45.5/IAPMO Z124 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

Note: EPA WaterSense Flushing Urinal Specification was not developed via an open process having a published development procedure in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 17, NEGATIVE: 8, NOT RETURNED: 3 Gray, Saltzberg, Tabakh

EXPLANATON OF NEGATIVE:
KRAUSE: I agree with Mr. Sigler et al.
MANN: I agree with Matt Sigler's statement.

Also, the ASME A112.19.2 test is to 0.5 and not 0.25 as suggested. Furthermore, CSA B45.5-11/IAPMO Z124-2011 refers back to the requirements of ASME A112.19.2.
RAWALPINDIWALA: We agree with Matt Sigler's comment.
SIGLER: Proposed flush volume is below EPA WaterSense requirements. PMI’s research study (refer to attached) for toilets, lavatory faucets and showerheads made it quite clear that EPA WaterSense products are not getting into people’s homes and places of business. The WE-Stand should focus on making the public aware of EPA WaterSense products versus developing a new arbitrary flush volume of 0.25 gpf. Download: href='/apps/org/workgroup/wetc/download.php/100242/PMI's WaterSense-market-penetration-study.pdf' title='PMI's WaterSense-market-penetration-study.pdf'>PMI's WaterSense-market-penetration-study.pdf.
SOVOCOOL: I concur with Tom Pape's reasoning.
STEFFENSON: Standard should be set to .125 gallons per flush. As noted in ballot problem statement, ample product exists at the .125 gallons per flush level to increase water savings.
TINDALL: I agree with Matt and Dave That setting an arbitrary [flush volume] only confuses the market place, we should follow WaterSense.
YEGGY: Below the WaterSense specification.

Name:	David Purkiss
Organization:	NSF International
Recommendation:	Revise text
Section Number:	402.4
Proposed Text:	**402.4 Residential Kitchen Faucets.** The maximum flow rate of residential kitchen faucets, including auxiliary water filtration system faucets, shall not exceed 1.8 gallons per minute (gpm) (6.8 L/m) at 60 pounds-force per square inch (psi) (414 kPa). Kitchen faucets are permitted to temporarily increase the flow above the maximum rate, but not to exceed 2.2 gpm (8.3 L/m) at 60 psi (414 kPa), and must revert to a maximum flow rate of 1.8 gpm (6.8 L/m) at 60 psi (414 kPa) upon valve closure.
Problem Statement:	CEC has determined that auxiliary water filtration system faucets need to meet the kitchen faucet flow rate performance requirement so this should be stated in this section.
Referenced Standards:	

TC ACTION:
Reject

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 16, NEGATIVE: 9, ABSTENTION: 1, NOT RETURNED: 2 Gray, Tabakh

NOTE: Item #029 failed to achieve the necessary 2/3 affirmative vote of returned ballots. In accordance with Section 6.8.2 of the Regulations Governing Consensus Development of WE•Stand, a public comment is requested for this proposal. The technical committee will reconsider this proposal as a public comment.

COMMENT ON AFFIRMATIVE:
SIGLER: The reasons this proposal should be "rejected" are:
1. ASME A112 Committee recently interpreted that filtration faucets should not be considered as kitchen faucets.
2. WE-Stand is not a California-only standard. Just because CEC Staff interprets that the performance requirements for kitchen faucets within CA Title 20 apply to filtration faucets does not mean it should be universally applied everywhere else.

EXPLANATION OF NEGATIVE:
ALLEN: I agree with the two other commenters.
HOFFMAN: I agree with Tom Pape.
KOELLER: Concur with the comment of Thomas Pape.
KRAUSE: I agree with Mr. Pape and Mr. Koeller. No reason was given for rejection. Flow rates for kitchen faucets and other filtration devices installed on kitchen faucets should be the same.
MAJEROWICZ: There is no reason to reject.
MECHAM: TC did not give explanation why it is rejected and the proposed change seems to be appropriate.
PAPE: I can think of no reason to reject, and the TC did not list a reason for rejection.

SHAPIRO: Agree with other negative comments.
SOVOCOOL: No reason is provided for rejection by the TC.

COMMENT ON ABSTENTION:
DIGIOVANNI: Agree with the posted negative comments.

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	402.6.1
Proposed Text:	**402.6.1 Showerheads.** Showerheads ~~shall comply with the requirements of the Energy Policy Act of 1992, except that the flow rate~~ shall not exceed <u>a flow rate of</u> 2.0 gpm (7.6 L/m) at 80 psi (552 kPa)~~,~~ when listed to ASME A112.18.1/CSA B125.1 and the EPA WaterSense Specification for Showerheads.
Problem Statement:	• The Energy Policy Act does not contain any showerhead requirements not already included within EPA WaterSense, ASME A112.18.1/CSA B125.1 and 2.0gpm at 80psi. • Removal of the comma is a punctuation correction.
Referenced Standards:	ASME A112.18.1/CSA B125.1 EPA WaterSense Specification for Showerheads.

Note: ASME A112.18.1/CSA B125.1 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

Note: EPA WaterSense Specification for Showerheads was not developed via an open process having a published development procedure in accordance with Section 15.2 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept as amended:

402.6.1 Showerheads. Showerheads shall not exceed a flow rate of 2.0 gpm (7.6 L/m) at 80 psi (552 kPa)~~,~~ ~~when~~ <u>and shall be</u> listed to ASME A112.18.1/CSA B125.1 and the EPA WaterSense Specification for Showerheads.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: This section should be the same as Section 408.2 of the UPC.

WE-Stand 2017 – (402.6.1) Item # 031

Name:	Michael Cudahy
Organization:	Plastic Pipe and Fittings Association (PPFA)
Recommendation:	Revise text
Section Number:	402.6.1
Proposed Text:	**402.6.1 Showerheads.** Showerheads shall comply with the requirements of the Energy Policy Act of 1992, except when listed to ASME A112.18.1/CSA B125.1 or the EPA WaterSense Specification for Showerheads where ~~that~~ the flow rate shall not exceed 2.0 gpm (7.6 L/m) at 80 psi (552 kPa) ~~when listed to ASME A112.18.1/CSA B125.1 and the EPA WaterSense Specification for Showerheads~~.
Problem Statement:	I'm not sure about the structure of this section and commented to make sure it was discussed. Is the intention to limit all showerheads to 2.0 gpm? Is the intention to limit it only in the case where it's dual listed? I read the original draft as the 2.0 gpm only impacts dual listed showerheads. Should it be all showerheads?
Referenced Standards:	ASME A112.18.1/CSA B125.1. EPA WaterSense Specification for Showerheads

Note: ASME A112.18.1/CSA B125.1 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

Note: EPA WaterSense Specification for Showerheads was not developed via an open process having a published development procedure in accordance with Section 15.2 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Reject

TC SUBSTANTIATION:
Previous action on Item #030 addressing the same action is preferred by the committee.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NOT RETURNED: 3 Gray, Sovocool, Tabakh

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	402.6.2
Proposed Text:	**402.6.2 Multiple Showerheads Serving One Shower Compartment.** The total allowable flow rate of water from multiple showerheads flowing at any given time, with or without a diverter, including rain systems, waterfalls, bodysprays, and jets, shall not exceed 2.0 gpm (7.6 L/m) per shower compartment, where the floor area of the shower compartment is less than 1800 square inches (1.161 m^2). For each increment of 1800 square inches (1.161 m^2) of floor area thereafter or part thereof, additional showerheads are allowed, provided the total flow rate of water from all flowing devices shall not exceed 2.0 gpm (7.6 L/m) for each such increment. **Exceptions:** (1) Gang showers in non-residential occupancies. Singular showerheads or multiple shower outlets serving one showering position in gang showers shall not have more than 2.0 gpm (7.6 L/m) total flow. (2) Where provided, shower compartments required for persons with disabilities in accordance with Table 901.1 shall not have more than 4.0 gpm (15.0 L/m) total flow, where one outlet is the hand shower. ~~The hand shower shall have a control with a nonpositive shutoff feature.~~
Problem Statement:	It is redundant and unnecessary to require specific product accessibility features, such as nonpositive shutoff, in this standard because appropriate accessibility requirements will be adopted by the local Authority Having Jurisdiction.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The possibility of a cross-connection is increased without requiring a nonpositive shutoff feature.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
RAWALPINDIWALA: This is a requirement under accessibility standards.
SIGLER: As indicated in Exception 2, accessible showers are required to be designed in accordance with ICC A117.1 as referenced in Table 901.1. Therefore, it is unnecessary to include specific product accessibility text in the code.

Name:	Matt Sigler
Organization:	PMI
Recommendation:	Revise text
Section Number:	402.6.3
Proposed Text:	**402.6.3 Bath and Shower Diverters.** Tub spout bath and shower diverters, while operating in the shower mode, shall perform ~~with zero leakage~~ in accordance with ASME A112.18.1/CSA B125.1.
Problem Statement:	As written, this code section does nothing to prevent unnecessary leakages of a diverter. If a diverter is going to leak, it will occur over the lifetime use of the diverter and not during the installation when inspected by the AHJ. What is important is that the diverter meet the performance requirements of ASME A112.18.1/CSA B125.1 which are already addressed in Section 5.3.6.1 of the standard. The methods for testing the rate of leakage are intended to be conducted in a laboratory while conducting product testing, and not in the field where the accuracy of such testing can be jeopardized. It should be pointed out that a project was opened by the ASME A112.18.1/CSA B125.1 Standard Committee back in January 2014, as requested by the original proponent of the text in the WE-Stand, to address the maximum rate of leakage from diverters. As of June 2015, no proposal has been submitted by the proponent for consideration by the committee. Therefore, until such requirements are revised first by the ASME A112.18.1/CSA B125.1 Standard Committee, they have no business being addressed separately in an installation code or standard such as the 2017 WE-Stand.
Referenced Standards:	ASME A112.18.1/CSA B125.1

Note: ASME A112.18.1/CSA B125.1 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 17, NEGATIVE: 7, ABSTENTION: 1, NOT RETURNED: 3 Gray, Steffenson, Tabakh

COMMENT ON AFFIRMATIVE:
SIGLER: The reasons this proposal should be "approved" are:
1. The WE-Stand is not a “product/testing standard” such as ASME A112.18.1/CSA B125.1 which dictates how a manufacturer is to design, produce and test their products, but is more in line with an installation standard that governs the installation of specific products or systems.
2. The rate of leakage for a tub spout bath and shower diverter is determined in a laboratory based on the requirements of ASME A112.18.1/CSA B125.1, and not in the field. Therefore, requiring leakage requirements to be called out in an installation standard such as WE-Stand is inappropriate, and should be corrected by referencing ASME A112.18.1/CSA B125.1.

3. It should be pointed out that a project was opened by the ASME A112.18.1/CSA B125.1 Standard Committee back in January 2014, as requested by the original proponent of the text in the WE-Stand, to address the maximum rate of leakage from diverters. As of June 2015, no proposal has been submitted by the proponent for consideration by the committee. Therefore, until such requirements are revised first by the ASME A112.18.1/CSA B125.1 Standard Committee, they have no business being addressed separately in an installation code or standard such as the 2017 WE-Stand.

EXPLANATION OF NEGATIVE:
HOFFMAN: Keep current language.
KOELLER: Agree with comments of Brent Mecham and Thomas Pape. Data already provided to the TC which was developed just from the California Energy Commission (CEC) database of August 12, 2015 shows there are 475 models of certified no-leak tub spout diverters available today in the U.S. marketplace. These models come from over 2 dozen different manufacturers.
This provision does nothing to prevent the marketplace continuing to function just as it does now throughout the U.S. It ONLY sets a more up-to-date and aggressive water-efficient threshold for those intending to utilize the WE-Stand document (identical to the situation created for many other water-efficient products).
Arguments have been made that there is no listing process available for these no-leak products, yet that is NOT the case. The CEC's database has existed since the standard was set by that organization 20 years ago. It is readily accessible from anywhere in the U.S., centralized (unlike for other plumbing products where listings are maintained by multiple different accredited certification bodies), easy to use, and fully capable of supporting the inquiries and actions needed by the authorities having jurisdiction, plumbers, contractors, engineers, design professionals, and members of the general public.
The arguments in opposition to no-leak TSDs offered by manufacturers are merely another roadblock intended to again thwart change and movement toward more water-efficient designs and practices.
KRAUSE: I agree with Mr. Pape and Mr. Koeller.
MAJEROWICZ: No-leak diverter valves exist then they should be used.
MANN: I concur with Tom Pape's statement. Over time diverter tub spouts leak. To be truly green, diverter spouts should not be allowed.
MECHAM: I concur with Tom Pape if no-leak diverter valves exist in the marketplace, they should be used.
PAPE: It is utter nonsense to argue for this change by stating the valve could leak at a later date. Virtually every fixture and fitting could (and often does) become less efficient over time. This standard is about building it right in the first place. Valve with zero leaks are readily available in the marketplace.
The proponents are brashly stating they want to design, manufacture, sell and install valves with leak inherent to the valve design. That might be legal, but it is definitely NOT water efficient and not appropriate in an ANSI Standard with "Water Efficiency" in its title.

COMMENT ON ABSTENTION:
DIGIOVANNI: Agree with posted negative comments.

Name:	Matt Sigler
Organization:	PMI
Recommendation:	Delete text
Section Number:	402.6.4.1
Proposed Text:	**~~402.6.4.1~~** ~~Control valves for showers and tubshower combinations shall be tagged, labeled, or marked with the manufacturer's minimum rated flow and such marking shall be visible after installation.~~
Problem Statement:	Marking requirements are already addressed in the applicable product standards (ex: ASSE 1016/ASME A112.1016/CSA B125.16 - Section V) and do not belong in the code. Therefore, such provisions should be vetted first through the appropriate standard development committee. The proposed language was rejected by the UPC Technical Committee, because the proponent failed to provide any data or evidence that any such markings would improve upon the safety provisions already addressed within the code. .Such requirements for tags, labels, and markings are unnecessary as such info is generally available on the manufacturer's website for a consumer to reference. .Markings on escutcheons or other trim components are not possible in all applications as these parts are used on a multitude of different products. Based on research conducted by manufacturers, a great majority of consumers want a minimal number of markings on escutcheons or other trim components. Which means that any such temporary tag, label, or marking will most likely be removed by the consumer before a new showerhead is installed. .What does "shall be visible after installation" mean? Does that mean after the control valve is installed or after the finishing trim of the shower is installed? .How will such a tag, label, or marking be uniformly enforced in the field? What exactly should be stated on the tag, label, or marking? What size is the text? Who will install? Where should it be installed?
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The marking/labeling provision is important to protect against scalding when considering aftermarket changes to the shower components, especially showerheads.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 22, NEGATIVE: 4, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
KRAUSE: I agree with Mr. Sigler and Mr. Mann.
MANN: I agree with Matt Sigler's comment. This is unenforceable. It would seem to me that the flow rate would be stamped on the face plate. Now, the homeowner changes the face plate and there goes the flow rate.
RAWALPINDIWALA: We agree with the original problem statement.
SIGLER: Based on my original reason statement, this code language is not enforceable and was introduced into the IAPMO Green Supplement without any technical data or evidence to support it. For

these reasons, the Uniform Plumbing Code (UPC) Technical Committee rejected it when proposed for the 2015 UPC.

Name:	Michael Cudahy
Organization:	Plastic Pipe and Fittings Association (PPFA)
Recommendation:	Revise text
Section Number:	403.8.1
Proposed Text:	**403.8.1 Durability.** All components expected to contact excreta or leachate shall be constructed of corrosion-resistant material such as stainless steel or durable polymers (ABS, PVC ~~Schedule 40~~, ~~P~~polypropylene, ~~H~~high-density polyethylene, ~~F~~fiber-reinforced polyester, or material of equivalent durability). Concrete in contact with excreta or leachate shall meet requirements of Section 403.8.2.
Problem Statement:	Schedule 40 is a sizing, not a material, and the names should not be capitalized.
Referenced Standards:	

TC ACTION:
Accept as amended:

403.8.1 ~~Durability~~ Corrosion Resistance. All components expected to contact excreta or leachate shall be constructed of corrosion-resistant material such as stainless steel or durable polymers ~~(ABS, PVC Schedule 40, Ppolypropylene, Hhigh-density polyethylene, Ffiber-reinforced polyester, or material of equivalent durability)~~. Concrete in contact with excreta or leachate shall meet requirements of Section 403.8.2.

TC SUBSTANTIATION:
Purpose of requirement is corrosion resistance not durability, laundry list is not necessary.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	403.8.4.1.2
Proposed Text:	**403.8.4.1.2 Overflow.** Where storage tank overflows are installed they shall be connected to the plumbing drainage system, or be emptied by a licensed hauler as required by local regulations, and at intervals specified in the owner's manual.
Problem Statement:	Rational: This code should make net-zero water buildings (The Living Building Challenge) possible to be installed legally in California. Buildings such as the Bullitt Center in Seattle, that employ composting toilets and reuse greywater, do not generate blackwater and are thus able to reuse all the greywater on-site. The leachate from the composting toilet is pumped out and is not connected to a plumbing drainage system.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Conflicts with concept of a tank with an overflow.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NOT RETURNED: 3 Gray, Tabakh, White

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	403.8.4.1.2.1
Proposed Text:	**403.8.4.1.2.1 Backwater Valve.** Storage tank overflows, when subject to backflow, shall be provided with a backwater valve ~~or check valve~~ at the point of connection to the plumbing drainage system ~~when connected to a public sewer system~~. The backwater valve shall be accessible for inspections and maintenance.
Problem Statement:	Rational: Not all tanks will be subject to backflow. Tanks that are subject to backflow and connected to any drainage system (public sewer or private septic system) should be protected.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 17, NEGATIVE: 8, ABSTENTION: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
HOFFMAN: Appears to be too permissive.
MANN: This is permissive language.
MECHAM: Permissive language.
RAWALPINDIWALA: Backwater valves should be required for all storage tank overflows.
SALTZBERG: I don't believe that the wording "when subject to backflow" clarifies anything.
SIGLER: How is "when subject to backflow" determined?
SOVOCOOL: Permissive language.
YEGGY: I am not against the principle, but it is not clear to me how this would be determined. I suggest examples or guidance be added which would help the user determine when a tank with an overflow is not subject to backflow.

Name:	Laura Allen
Organization:	Greywater action
Recommendation:	Revise text
Section Number:	403.9.11.3.1
Proposed Text:	**403.9.11.3.1 Backwater Valve.** Storage tank overflows subject to backflow shall be provided with a backwater valve ~~or check valve~~ at the point of connection to the plumbing drainage system when connected to a public sewer system or on-site wastewater system. The backwater valve shall be accessible for inspections and maintenance.
Problem Statement:	Rational: There could be situations where the overflow is not subject to backflow, and so it should be clarified that a backwater valve only needed when there could be backflow. Since backwater valves can be opened, and check valves can't, it seems like backwater valves should be used instead of check valves.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 16, NEGATIVE: 8, ABSTENTION: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: This is permissive language.
MECHAM: Permissive language.
RAWALPINDIWALA: All storage tank overflows should have a backwater valve.
SALTZBERG: I don't believe that the wording "subject to backflow" clarifies anything.
SIGLER: The proponent has failed to provide any technical data to demonstrate that the proposed language will not jeopardize public health and safety.
SOVOCOOL: Permissive language.
TINDALL: Permissive language.
YEGGY: Not clear how it would be determined if the drain line is subject to backflow.

COMMENT ON ABSTENTION:
DIGIOVANNI: Abstain
HOFFMAN: Not sure what to do. Appears to be permissive language.

Name:	Josh Jacobs
Organization:	UL
Recommendation:	Add text
Section Number:	404.2, Table 901.1
Proposed Text:	**404.2 Clothes Washers.** Residential clothes washers shall be in accordance with the Energy Star program requirements. Commercial clothes washers shall be in accordance with Energy Star program requirements, where such requirements exist. Residential and residential style commercial use clothes washers shall be listed to UL 7003.

TABLE 901.1
REFERENCED STANDARDS

STANDARD NUMBER-YEAR	STANDARD TITLE	REFERENCED SECTION
UL 7003-2016	Sustainability Standard for Household Clothes Washers	404.2

(portions of table not shown remain unchanged)

Problem Statement:	While energy conservation is an important part of the triple bottom line, it is not the only one. As this standard strives to ensure we not only conserve water but our water systems and products that utilize water are sustainable in nature, we should be looking more and more for multi-attribute environmental standards. A multi-attribute environmental standard treats individual products very much the way that the USGBC's LEED Rating System treats buildings, but looking at products as a complete picture of their environmental impact from production, use phase, and end of life. Much the way that section 406.4 has listed a multi-attribute environmental standard for drinking water treatment systems, we should also do the same where other products have these standards as well. UL 7003 is a multi-attribute environmental standard for household clothes washers and fits this need perfectly.
Referenced Standards:	UL-7003-2016

Note: UL-7003-2016 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Reject

TC SUBSTANTIATION:
Proposal adds requirements that go beyond the scope of the standard.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	David Purkiss
Organization:	NSF International
Recommendation:	Delete text
Section Number:	406.1
Proposed Text:	**406.1 Water Softeners.** ~~Actuation of regeneration of w~~Water softeners shall be listed to NSF 44. Water softeners shall have a rated salt efficiency exceeding 3400 grains (gr) (0.2200 kg) of total hardness exchange per pound (lb) (0.5 kg) of salt, based on sodium chloride (NaCl) equivalency, and shall not generate more than 4 gallons (15.1 L) of water per 1000 grains (0.0647 kg) of hardness removed during the service cycle.
Problem Statement:	The first sentence does not make sense. NSF/ANSI 44 applies to water softeners as a whole not just the single function of regeneration. So we are suggesting deleting "Actuation of regeneration of..." Also it should be noted that the requirement in this section goes above and beyond the current requirements of NSF/ANSI 44 so it is unclear how conformance would be demonstrated. The specific requirement regarding efficiency requirements should be added to NSF/ANSI 44 as a minimum requirement.
Referenced Standards:	NSF 44

Note: NSF 44 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
YEGGY: I agree with the proposal to strike “Actuation of regeneration” from the first sentence. Also as noted in the justification for this change, this section does not align with the current requirements of NSF/ANSI 44 and therefore it is unclear how conformance would be demonstrated. While that issue has nothing to do with the proposed change, it highlights a potential opportunity for us to improve the code in this section in the future.

Name:	David Purkiss
Organization:	NSF International
Recommendation:	Delete text
Section Number:	406.4
Proposed Text:	~~**406.4 Drinking Water Treatment Systems.** Drinking water treatment systems shall be listed to WQA/ASPE S-803.~~
Problem Statement:	WQA/ASPE S-803 only covers carbon filters which would eliminate the use of water softeners and ROs as listed in Section 406. Also this standard does not establish any water efficiency requirements. Therefore this reference should be deleted
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Current language is preferred.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
MANN: The proponent should, during the comment period, propose language to cover all units. Water softeners and RO units along with the current language.
YEGGY: WQA/ASPE/ANSI S-803 currently covers carbon filters, string-wound filters, PP & PE filters, UV treatment systems, and dispensers or fountains (including coolers, hot water dispensers and carbonators). The standard development group is adding revisions that also cover softeners and reverse osmosis systems, including water efficiency requirements. Reference to this standard addresses the specific environmental impacts of water treatment systems and will not eliminate softeners or RO products which meet the water efficiency requirements.

EXPLANATION OF NEGATIVE:
SIGLER: As indicated by the proponent, the current code text eliminates the use of water softeners and ROs as listed in Section 406.

WE-Stand 2017 – (407.1.6) Item # 044

Name:	Michael Cudahy
Organization:	Plastic Pipe and Fittings Association (PPFA)
Recommendation:	Revise text
Section Number:	407.1.6
Proposed Text:	**407.1.6 Food Waste Devices.** Where <u>installed,</u> food waste devices ~~exist they~~ shall be ~~installed~~ in accordance with Section 407.1.6.1 through Section 407.1.6.5.
Problem Statement:	The document has a number of sections where editorially, "where installed" should be added, this is one of them. IAPMO staff can probably best hunt them down.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	408.1
Proposed Text:	**408.1 General.** Where installed, leak detection and control devices shall comply with IAPMO IGC115. ~~Note: Leak detection and control devices help protect property from water damage and also conserve water by shutting off the flow when leaks are detected.~~
Problem Statement:	Unnecessary. This is analogous to having a note under water closets that states 1.28gpf water closets save more water than 1.6gpf water closets.
Referenced Standards:	IGC 115

Note: IAPMO Guide Criteria (IGC) 115 publication was not developed via an open process having a published development procedure in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: The devices should comply with a recognized ANSI Standard and not a guide.

Name:	Brent Mecham
Organization:	Irrigation Association
Recommendation:	Revise text
Section Number:	414.1
Proposed Text:	**414.0 Landscape Irrigation Systems.** **414.1 General.** Where landscape irrigation systems are installed, they shall ~~use low application irrigation methods and~~ comply with Sections 41~~3~~4.2 through 41~~3~~4.13. Requirements ~~limiting the amount or type of plant material used in landscapes~~ regarding landscape design including plant selection shall be established by the Authority Having Jurisdiction. ~~**Exception**: Plants grown for food production.~~
Problem Statement:	Simplify the charging statement and correct section numbers to be those in the following section which has been numbered 414.0
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Current language is preferred.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Ron Wolfarth
Organization:	Rain Bird Corporation
Recommendation:	Revise text
Section Number:	414.1
Proposed Text:	**414.1 General.** Where landscape irrigation systems are installed, they shall ~~use low application irrigation methods and~~ comply with Sections 41~~3~~4.2 through 41~~3~~4.13. Requirements limiting the amount or type of plant material used in landscapes shall be established by the Authority Having Jurisdiction. **Exception:** Plants grown for food production.
Problem Statement:	Problem 1: Sprinklers with 'lower' precipitation (application) rates tend to be less efficient because they tend to produce a higher portion of small water droplets that are more easily blown off-target by slight wind and tend to more easily evaporate before hitting the ground. These smaller water droplets have less mass. Light wind easily moves these water droplets off target. The smaller surface to mass ratio of the small water droplets exposes more surface area to the air greatly increasing evaporative water losses. Substantiation for Problem 1: The reason a Precipitation Rate limit is proposed is to reduce runoff waste. Runoff is the problem, not high Precipitation Rates. Precipitation rate limits are not the best way or even a good way to reduce or eliminate runoff waste. Irrigation systems with 1 inch per hour Precipitation Rates apply water at a rate that far exceeds the Infiltration Rate of all non-manufactured soils. Therefore, runoff is not eliminated. Runoff will simply start a short time later compared to an irrigation system with, say, a 2.0 inch per hour Precipitation Rate. Cycle run times must be reduced in order to eliminate runoff and precipitation rate limits alone do not address this. It is a faulty notion that prohibiting higher Precipitation Rate (but perhaps highly efficient) sprinklers will conserve water. There are many, significant negative consequences to limiting precipitation rates. A) Wind Drift and Evaporation: Wind Drift and Evaporation are shown to be increased when using sprinklers with lower Precipitation Rates which tend to generate a greater proportion of smaller water droplets. The Science: In a study[1] conducted by University of Arizona and summarized in a White Paper by Randy Montgomery[2] and in a presentation by Randy Montgomery at the Irrigation Association Trade Show and Conference in 2013[3], it is shown that two spray sprinklers had very different performance in outdoor wind conditions despite having very similar performance in outdoor zero wind conditions. The more efficient sprinkler with a Precipitation Rate of 1.6 inches per hour applied 20% more of its water to the target area in a 5 mph wind compared to the sprinkler with a Precipitation Rate of 1.0 inch per hour. More Science: A study conducted by California State Polytechnic University, Pomona[4] found that 76 - 83% of runoff is due to wind, even at wind speeds of 0 - 5 mph. This study was performed with (low precipitation rate) multi-stream, multi-trajectory nozzles and (high precipitation rate) spray nozzles. B) Extended Run Times: Low Precipitation Rate systems will extend the schedule run time needed to apply the budgeted amount of water. This causes more of the irrigation to happen during worsening wind conditions. For example, in Los Angeles and San Diego, the ideal time to irrigate is between 5:00 and 6:00 AM when wind speed is approximately 1 - 2 mph.[5] The average daily wind speed in those areas is 5 mph or higher[6], the speed at which the low Precipitation Rate sprinkler in the University of Arizona study applied only about 63% of its water to the target area. The lower the Precipitation Rate limit imposed, the more irrigation will happen during windier, inefficient times. C) Restrictions on solutions for large turf areas: Many of the highly efficient, larger area turf sprinklers used to irrigate parks,

	schools, sports fields and golf courses would be eliminated from use. Many have Precipitation Rates higher than 1.0 inch per hour, especially when used in part circle operation. These rotors are the most efficient means of irrigating these spaces. Sprinklers in golf course playing surfaces would often have to be full-circle sprinklers located near the edge of the playing surface in order to provide adequate water to the turf. This would cause excessive overspray onto non-playing surfaces where it has less beneficial use. There is existing, affordable control technology on the market today from several manufacturers that eliminates runoff waste. A) The most effective solution to eliminating runoff waste is to break irrigation run times into short cycles that stop before runoff begins, pausing irrigation to allow water to soak in and then repeating the pattern until the irrigation requirement is met. There are products on the market today that accomplish this with no user intervention or change in user behavior. Section 414.5 of this proposed addresses the requirements for these control systems. B) The Science: The study conducted at California State Polytechnic University, Pomona[4] showed that using short cycles and soak times resulted in reducing runoff to about 0.25% of total water applied when using high and low precipitation rate sprinklers. In other words, 99.75% of the water applied did not runoff regardless of the sprinklers' Precipitation Rate when proper Irrigation Management was employed. This can be accomplished automatically with no user intervention or change in behavior. The low precipitation rate sprinklers used in the study were multi-stream, multi-trajectory nozzles and conventional, spray heads. Automation with Available Products: Irrigation controllers on the market today from several manufacturers allow the user to limit cycle time to eliminate runoff. The only expertise required is during the installation and set-up time. This level of expertise is reasonable to expect. Products can be chosen that require no change in end-user behavior. Conclusions: 1) Lower Precipitation Rates will only delay the start of runoff and not eliminate it because no soil aside from manufactured putting greens and manufactured sports fields can absorb water at the rate of 1.0 inch per hour. 2) Imposing Precipitation Rate limits ignores the very significant water waste due to Wind Drift and Evaporation losses that tend to increase as Precipitation Rate is lowered. 3) Even low Precipitation Rate sprinklers require management via the controller to eliminate runoff due to the infiltration rate of the soil, so why deny irrigators the right to use the most efficient irrigation solutions possible? The benefits of a Precipitation Rate limit are greatly over-shadowed by the negative consequences. 4) Irrigation Management strategies have been shown in university research to completely eliminate runoff regardless of the Precipitation Rate of the sprinklers used. 5) Products on the market today make the employment of Irrigation Management strategies that completely eliminate runoff easy for the end-user and require only reasonable expertise on the part of the installer. The proposed standard requires a "Smart Controller." Adding a requirement that it allow the user to set a maximum cycle time per zone as suggested above would solve the problem of runoff. 6) Science supports these conclusions. 7) Do not settle for a partial, weak, ineffective measure to only reduce runoff while harming irrigation water efficiency. Provided for reference: Notes: [1] Assessment of Application Efficiency and Uniformity of Fixed Spray and Multi-Stream Report Apr 2013 Brown Gilbert [2] Wind Effects on Sprinkler Irrigation Performance Manuscript -Randy Montgomery [3] Lets take it outside - Randy Montgomery IA 2013 Presentation [4] Effect of Nozzles and Cycle and Soak Scheduling on Landscape Irrigation Efficiency-Kumar-Vis [5] https://weatherspark.com [6] http://www.ncdc.noaa.gov/sites/default/files/attachments/wind1996.pdf
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 23, NEGATIVE 3, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
KRAUSE: Due to action taken on #49.
MANN: The use of high efficient spray heads is preferred.
PAPE: Removing the requirement is not an acceptable option as it allows for devices that are known to make water waste easier. The studies cited were not properly designed to illuminate the advantages of rotating stream heads. The proponent should have requested the maximum precipitation rate be raised rather than eliminated.

Name:	Brent Mecham
Organization:	Irrigation Association
Recommendation:	Revise text
Section Number:	414.5-414.5.7
Proposed Text:	**414.5 Irrigation Control Systems.** Where installed as part of a landscape irrigation system, irrigation control systems shall: **414.5.1** Automatically adjust the irrigation schedule to respond to plant water needs determined by weather or soil moisture conditions. **414.5.2** Utilize on-site sensors to inhibit or suspend irrigation when adequate soil moisture is present or during ~~a~~ rainfall or freezing conditions. (sections 414.5.3 through 414.5.6 remain unchanged) **414.5.7** The site specific settings of the irrigation control system ~~affecting the irrigation and~~ shall be posted at the control system location. The posted data, where applicable to the settings of the controller, shall include: (1) Precipitation rate for each zone. (2) Plant evapotranspiration coefficients for each zone. (3) Soil type and ~~absorption~~ basic intake rate ~~for each zone~~. (4) Rain sensor settings. (5) Soil moisture setting. (6) Peak demand schedule including run times for each zone and the number of cycles to mitigate runoff and monthly adjustments or percentage change from peak demand schedule.
Problem Statement:	Minor edits to add clarity to existing language.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Brent Mecham
Organization:	Irrigation Association
Recommendation:	Delete text
Section Number:	414.9-414.10
Proposed Text:	~~**414.9 Narrow or Irregularly Shaped Landscape Areas**. Narrow or irregularly shaped landscape areas, less than 4 feet (1219 mm) in any direction across any opposing boundaries shall not be irrigated by any irrigation emission device except low flow emitters.~~ ~~**414.10 Sloped Areas.** Where soil surface rises more than 1 foot (305 mm) per 4 feet (1219 mm) of length, the irrigation zone system average precipitation rate shall not exceed 0.75 inches (19 mm) per hour as verified through either of the following methods:~~ ~~(a) manufacturer documentation that the precipitation rate for the installed sprinkler head does not exceed 0.75 inches (19 mm) per hour where the sprinkler heads are installed no closer than the specified radius and where the water pressure of the irrigation system is no greater than the manufacturer's recommendations.~~ ~~(b) catch can testing in accordance with the requirements of the Authority Having Jurisdiction and where emitted water volume is measured with a minimum of 6 catchment containers at random places within the irrigation zone for a minimum of 15 minutes to determine the average precipitation rate, expressed as inches per hour.~~ (renumber remaining sections)
Problem Statement:	Section 414.8 System Performance Requirements covers these two sections by stating the performance requirement that water is not allowed to runoff out of the irrigation zone. The irrigation designer should be allowed to determine the best way to provide irrigation to meet the plant water demand and coupled with an appropriately programmed WaterSense labeled controller these requirements are not needed.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Current language provides good guidance

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Ron Wolfarth
Organization:	Rain Bird Corporation
Recommendation:	Revise text
Section Number:	414.9
Proposed Text:	**414.9 Narrow or Irregularly Shaped Landscape Areas.** Narrow or irregularly shaped landscape areas, less than 4 feet (1219 mm) in any direction across any opposing boundaries shall not be irrigated by any irrigation emission device except sub-surface or low flow emitters.
Problem Statement:	The purpose of the restriction on the type of irrigation emitter used in narrow and irregularly shaped landscape areas is to reduce or eliminate over-spray and runoff. Sub-surface irrigation emitters accomplish this purpose regardless of their flow rate. Requiring that sub-surface irrigation emitters also have low flow rates is an unnecessary restriction that makes no contribution to water efficiency.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Kelsey Jacquard
Organization:	Hunter Industries
Recommendation:	Revise text
Section Number:	414.10
Proposed Text:	**414.10 Sloped Areas.** Where soil surface rises more than 1 foot (305 mm) per 4 feet (1219 mm) of length, the irrigation zone system shall not allow irrigation water to run out of the irrigation zone. ~~average precipitation rate shall not exceed 0.75 inches (19 mm) per hour as verified through either of the following methods.~~ ~~(a) manufacturer documentation that the precipitation rate for the installed sprinkler head does not exceed 0.75 inches (19 mm) per hour where the sprinkler heads are installed no closer than the specified radius and where the water pressure of the irrigation system is no greater than the manufacturer's recommendations.~~ ~~(b) catch can testing in accordance with the requirements of the Authority Having Jurisdiction and where emitted water volume is measured with a minimum of 6 catchment containers at random places within the irrigation zone for a minimum of 15 minutes to determine the average precipitation rate, expressed as inches per hour.~~
Problem Statement:	It is recommended to eliminate the precipitation rate requirement and instead require the absence of any runoff through proper scheduling. Drip products can have a precipitation rate greater than 0.75 in/hr or even 1.0 in/hr depending on the emitter spacing and emitter flow.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The committee prefers the action taken on item #055. The proposed text is considered to be unenforceable.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Ronald Wolfarth
Organization:	Rain Bird Corporation
Recommendation:	Delete text
Section Number:	414.10
Proposed Text:	**414.10 Sloped Areas.** ~~Where soil surface rises more than 1 foot (305 mm) per 4 feet (1219 mm) of length, the irrigation zone system average precipitation rate shall not exceed 0.75 inches (19 mm) per hour as verified through either of the following methods:~~ ~~(a) manufacturer documentation that the precipitation rate for the installed sprinkler head does not exceed 0.75 inches (19 mm) per hour where the sprinkler heads are installed no closer than the specified radius and where the water pressure of the irrigation system is no greater than the manufacturer's recommendations.~~ ~~(b) catch can testing in accordance with the requirements of the Authority Having Jurisdiction and where emitted water volume is measured with a minimum of 6 catchment containers at random places within the irrigation zone for a minimum of 15 minutes to determine the average precipitation rate, expressed as inches per hour.~~
Problem Statement:	Problem 1: Sprinklers with 'lower' precipitation (application) rates tend to be less efficient because they tend to produce a higher portion of small water droplets that are more easily blown off-target by slight wind and tend to more easily evaporate before hitting the ground. These smaller water droplets have less mass. Light wind easily moves these water droplets off target. The smaller surface to mass ratio of the small water droplets exposes more surface area to the air greatly increasing evaporative water losses. Substantiation for Problem 1: The reason a Precipitation Rate limit is proposed is to reduce runoff waste. Runoff is the problem, not high Precipitation Rates. Precipitation rate limits are not the best way or even a good way to reduce or eliminate runoff waste. Irrigation systems with 1 inch per hour Precipitation Rates apply water at a rate that far exceeds the Infiltration Rate of all non-manufactured soils. Therefore, runoff is not eliminated. Runoff will simply start a short time later compared to an irrigation system with, say, a 2.0 inch per hour Precipitation Rate. Cycle run times must be reduced in order to eliminate runoff and precipitation rate limits alone do not address this. It is a faulty notion that prohibiting higher Precipitation Rate (but perhaps highly efficient) sprinklers will conserve water. There are many, significant negative consequences to limiting precipitation rates. A) Wind Drift and Evaporation: Wind Drift and Evaporation are shown to be increased when using sprinklers with lower Precipitation Rates which tend to generate a greater proportion of smaller water droplets. The Science: In a study[1] conducted by University of Arizona and summarized in a White Paper by Randy Montgomery[2] and in a presentation by Randy Montgomery at the Irrigation Association Trade Show and Conference in 2013[3], it is shown that two spray sprinklers had very different performance in outdoor wind conditions despite having very similar performance in outdoor zero wind conditions. The more efficient sprinkler with a Precipitation Rate of 1.6 inches per hour applied 20% more of its water to the target area in a 5 mph wind compared to the sprinkler with a Precipitation Rate of 1.0 inch per hour. More Science: A study conducted by California State Polytechnic University, Pomona[4] found that 76 - 83% of runoff is due to wind, even at wind speeds of 0 - 5 mph. This study was performed with (low precipitation rate) multi-stream, multi-trajectory nozzles and (high precipitation rate) spray nozzles. B) Extended Run Times: Low Precipitation Rate systems will extend the schedule run time needed to apply the budgeted amount of water. This causes more of the irrigation to happen during worsening wind conditions. For example, in Los Angeles and San Diego,

	the ideal time to irrigate is between 5:00 and 6:00 AM when wind speed is approximately 1 - 2 mph.[5] The average daily wind speed in those areas is 5 mph or higher[6], the speed at which the low Precipitation Rate sprinkler in the University of Arizona study applied only about 63% of its water to the target area. The lower the Precipitation Rate limit imposed, the more irrigation will happen during windier, inefficient times. C) Restrictions on solutions for large turf areas: Many of the highly efficient, larger area turf sprinklers used to irrigate parks, schools, sports fields and golf courses would be eliminated from use. Many have Precipitation Rates higher than 1.0 inch per hour, especially when used in part circle operation. These rotors are the most efficient means of irrigating these spaces. Sprinklers in golf course playing surfaces would often have to be full-circle sprinklers located near the edge of the playing surface in order to provide adequate water to the turf. This would cause excessive overspray onto non-playing surfaces where it has less beneficial use. There is existing, affordable control technology on the market today from several manufacturers that eliminates runoff waste. A) The most effective solution to eliminating runoff waste is to break irrigation run times into short cycles that stop before runoff begins, pausing irrigation to allow water to soak in and then repeating the pattern until the irrigation requirement is met. There are products on the market today that accomplish this with no user intervention or change in user behavior. Section 414.5 of this proposed addresses the requirements for these control systems. B) The Science: The study conducted at California State Polytechnic University, Pomona[4] showed that using short cycles and soak times resulted in reducing runoff to about 0.25% of total water applied when using high and low precipitation rate sprinklers. In other words, 99.75% of the water applied did not runoff regardless of the sprinklers' Precipitation Rate when proper Irrigation Management was employed. This can be accomplished automatically with no user intervention or change in behavior. The low precipitation rate sprinklers used in the study were multi-stream, multi-trajectory nozzles and conventional, spray heads. Automation with Available Products: Irrigation controllers on the market today from several manufacturers allow the user to limit cycle time to eliminate runoff. The only expertise required is during the installation and set-up time. This level of expertise is reasonable to expect. Products can be chosen that require no change in end-user behavior. Conclusions: 1) Lower Precipitation Rates will only delay the start of runoff and not eliminate it because no soil aside from manufactured putting greens and manufactured sports fields can absorb water at the rate of 1.0 inch per hour. 2) Imposing Precipitation Rate limits ignores the very significant water waste due to Wind Drift and Evaporation losses that tend to increase as Precipitation Rate is lowered. 3) Even low Precipitation Rate sprinklers require management via the controller to eliminate runoff due to the infiltration rate of the soil, so why deny irrigators the right to use the most efficient irrigation solutions possible? The benefits of a Precipitation Rate limit are greatly over-shadowed by the negative consequences. 4) Irrigation Management strategies have been shown in university research to completely eliminate runoff regardless of the Precipitation Rate of the sprinklers used. 5) Products on the market today make the employment of Irrigation Management strategies that completely eliminate runoff easy for the end-user and require only reasonable expertise on the part of the installer. The proposed standard requires a "Smart Controller." Adding a requirement that it allow the user to set a maximum cycle time per zone as suggested above would solve the problem of runoff. 6) Science supports these conclusions. 7) Do not settle for a partial, weak, ineffective measure to only reduce runoff while harming irrigation water efficiency. Provided for reference: Notes: [1] Assessment of Application Efficiency and Uniformity of Fixed Spray and Multi-Stream Report Apr 2013 Brown Gilbert [2] Wind Effects on Sprinkler Irrigation Performance Manuscript -Randy Montgomery [3] Lets take it outside - Randy Montgomery IA 2013 Presentation [4] Effect of Nozzles and Cycle and Soak Scheduling on Landscape Irrigation Efficiency-Kumar-Vis [5] https://weatherspark.com

	[6] http://www.ncdc.noaa.gov/sites/default/files/attachments/wind1996.pdf
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Current language provides good guidance

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Kelsey Jacquard
Organization:	Hunter Industries
Recommendation:	Delete text
Section Number:	414.11
Proposed Text:	~~**414.11 Sprinkler Head Installations.** All installed sprinkler heads shall be low precipitation rate sprinkler heads~~. (renumber remaining sections)
Problem Statement:	California has already adopted water restricting measures that base landscape irrigation design on water use requirements and efficiencies instead of product precipitation rates. The landscape irrigation requirements of the WEStand Document restrict irrigation product choices and irrigation designs based on a maximum precipitation rate to eliminate runoff when proper scheduling has a larger effect. We recommend that the industry be consistent in the requirements for landscape irrigation. Reference documents provided: Model Water Efficient Landscape Ordinance Ramesh Kumar and Eudell Vis, May 2009, Effect of Rotary Nozzles and Cycle and Soak Scheduling on Landscape Irrigation Efficiency
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Low precipitation rate is an important part of irrigation efficiency.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

WE-Stand 2017 – (414.11, 414.11.3) Item # 060

Name:	Brent Mecham
Organization:	Irrigation Association
Recommendation:	Revise text
Section Number:	414.11, 414.11.3
Proposed Text:	**414.11 Sprinkler Head Installations.** All installed sprinkler heads shall ~~be low precipitation rate sprinkler heads~~ comply with ASABE/ICC 802. (414.11.1-414.11.2 remain unchanged) **414.11.3 Pop-up Type Sprinkler Heads.** Where pop-up type sprinkler heads are installed, the sprinkler heads shall pop-up to a height above vegetation level and of not less than 4 inches (102 mm) above the soil level when emitting water. ~~Sprinkler heads shall comply with the requirements of standard ASABE/ICC 802 2014.~~
Problem Statement:	List the applicable standard at the beginning of the section rather than at the end like an afterthought. Strike the wording of low precipitation rate sprinklers heads because the arbitrary precipitation rate in the definitions has no scientific justification. Scheduling and management are what improves water use efficiency. Referenced standard is already within the document and has been previously reviewed by IAPMO.
Referenced Standards:	ASABE/ICC 802

Note: ASABE/ICC 802 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Ron Wolfarth
Organization:	Rain Bird Corporation
Recommendation:	Revise text
Section Number:	414.11
Proposed Text:	**414.11 Sprinkler Head Installations.** All installed sprinkler heads shall ~~be low precipitation rate sprinkler heads~~ comply with Section 414.11.1 through Section 414.11.3.”
Problem Statement:	Problem 1: Sprinklers with 'lower' precipitation (application) rates tend to be less efficient because they tend to produce a higher portion of small water droplets that are more easily blown off-target by slight wind and tend to more easily evaporate before hitting the ground. These smaller water droplets have less mass. Light wind easily moves these water droplets off target. The smaller surface to mass ratio of the small water droplets exposes more surface area to the air greatly increasing evaporative water losses. Substantiation for Problem 1: The reason a Precipitation Rate limit is proposed is to reduce runoff waste. Runoff is the problem, not high Precipitation Rates. Precipitation rate limits are not the best way or even a good way to reduce or eliminate runoff waste. Irrigation systems with 1 inch per hour Precipitation Rates apply water at a rate that far exceeds the Infiltration Rate of all non-manufactured soils. Therefore, runoff is not eliminated. Runoff will simply start a short time later compared to an irrigation system with, say, a 2.0 inch per hour Precipitation Rate. Cycle run times must be reduced in order to eliminate runoff and precipitation rate limits alone do not address this. It is a faulty notion that prohibiting higher Precipitation Rate (but perhaps highly efficient) sprinklers will conserve water. There are many, significant negative consequences to limiting precipitation rates. A) Wind Drift and Evaporation: Wind Drift and Evaporation are shown to be increased when using sprinklers with lower Precipitation Rates which tend to generate a greater proportion of smaller water droplets. The Science: In a study[1] conducted by University of Arizona and summarized in a White Paper by Randy Montgomery[2] and in a presentation by Randy Montgomery at the Irrigation Association Trade Show and Conference in 2013[3], it is shown that two spray sprinklers had very different performance in outdoor wind conditions despite having very similar performance in outdoor zero wind conditions. The more efficient sprinkler with a Precipitation Rate of 1.6 inches per hour applied 20% more of its water to the target area in a 5 mph wind compared to the sprinkler with a Precipitation Rate of 1.0 inch per hour. More Science: A study conducted by California State Polytechnic University, Pomona[4] found that 76 - 83% of runoff is due to wind, even at wind speeds of 0 - 5 mph. This study was performed with (low precipitation rate) multi-stream, multi-trajectory nozzles and (high precipitation rate) spray nozzles. B) Extended Run Times: Low Precipitation Rate systems will extend the schedule run time needed to apply the budgeted amount of water. This causes more of the irrigation to happen during worsening wind conditions. For example, in Los Angeles and San Diego, the ideal time to irrigate is between 5:00 and 6:00 AM when wind speed is approximately 1 - 2 mph.[5] The average daily wind speed in those areas is 5 mph or higher[6], the speed at which the low Precipitation Rate sprinkler in the University of Arizona study applied only about 63% of its water to the target area. The lower the Precipitation Rate limit imposed, the more irrigation will happen during windier, inefficient times. C) Restrictions on solutions for large turf areas: Many of the highly efficient, larger area turf sprinklers used to irrigate parks, schools, sports fields and golf courses would be eliminated from use. Many have Precipitation Rates higher than 1.0 inch per hour, especially when used in part circle operation. These rotors are the most efficient means of irrigating these spaces. Sprinklers in

	golf course playing surfaces would often have to be full-circle sprinklers located near the edge of the playing surface in order to provide adequate water to the turf. This would cause excessive overspray onto non-playing surfaces where it has less beneficial use. There is existing, affordable control technology on the market today from several manufacturers that eliminates runoff waste. A) The most effective solution to eliminating runoff waste is to break irrigation run times into short cycles that stop before runoff begins, pausing irrigation to allow water to soak in and then repeating the pattern until the irrigation requirement is met. There are products on the market today that accomplish this with no user intervention or change in user behavior. Section 414.5 of this proposed addresses the requirements for these control systems. B) The Science: The study conducted at California State Polytechnic University, Pomona[4] showed that using short cycles and soak times resulted in reducing runoff to about 0.25% of total water applied when using high and low precipitation rate sprinklers. In other words, 99.75% of the water applied did not runoff regardless of the sprinklers' Precipitation Rate when proper Irrigation Management was employed. This can be accomplished automatically with no user intervention or change in behavior. The low precipitation rate sprinklers used in the study were multi-stream, multi-trajectory nozzles and conventional, spray heads. Automation with Available Products: Irrigation controllers on the market today from several manufacturers allow the user to limit cycle time to eliminate runoff. The only expertise required is during the installation and set-up time. This level of expertise is reasonable to expect. Products can be chosen that require no change in end-user behavior. Conclusions: 1) Lower Precipitation Rates will only delay the start of runoff and not eliminate it because no soil aside from manufactured putting greens and manufactured sports fields can absorb water at the rate of 1.0 inch per hour. 2) Imposing Precipitation Rate limits ignores the very significant water waste due to Wind Drift and Evaporation losses that tend to increase as Precipitation Rate is lowered. 3) Even low Precipitation Rate sprinklers require management via the controller to eliminate runoff due to the infiltration rate of the soil, so why deny irrigators the right to use the most efficient irrigation solutions possible? The benefits of a Precipitation Rate limit are greatly over-shadowed by the negative consequences. 4) Irrigation Management strategies have been shown in university research to completely eliminate runoff regardless of the Precipitation Rate of the sprinklers used. 5) Products on the market today make the employment of Irrigation Management strategies that completely eliminate runoff easy for the end-user and require only reasonable expertise on the part of the installer. The proposed standard requires a "Smart Controller." Adding a requirement that it allow the user to set a maximum cycle time per zone as suggested above would solve the problem of runoff. 6) Science supports these conclusions. 7) Do not settle for a partial, weak, ineffective measure to only reduce runoff while harming irrigation water efficiency. Provided for reference: Notes: [1] Assessment of Application Efficiency and Uniformity of Fixed Spray and Multi-Stream Report Apr 2013 Brown Gilbert [2] Wind Effects on Sprinkler Irrigation Performance Manuscript -Randy Montgomery [3] Lets take it outside - Randy Montgomery IA 2013 Presentation [4] Effect of Nozzles and Cycle and Soak Scheduling on Landscape Irrigation Efficiency-Kumar-Vis [5] https://weatherspark.com [6] http://www.ncdc.noaa.gov/sites/default/files/attachments/wind1996.pdf
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Based on committee action of item #060.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NOT RETURNED: 3 Gray, Saltzberg, Tabakh

Name:	Kelsey Jacquard
Organization:	Hunter Industries
Recommendation:	Revise text
Section Number:	414.11.1
Proposed Text:	**414.11.1 Sprinkler Heads in Common Irrigation Zones.** Sprinkler heads installed in irrigation zones served by a common valve shall be limited to applying water to plants with similar irrigation needs~~, and shall have matched precipitation rates (identical inches of water application per hour as rated or tested, plus or minus 5 percent)~~.
Problem Statement:	It is recommended to remove the requirement of matched precipitation rate since it would be limiting to irrigation designs. Otherwise, please clarify the requirement of matched precipitation. Is the precipitation rate of the zone checked after installation using catch devices, or is it based on manufacturer data? Also, a tolerance of plus or minus 5% is very tight. A product with an application rate of .4 in/hr would be allowed a range of 0.38 - 0.42 in/hr, which may be difficult to measure and maintain.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTITATION:
Current language is preferred. Provision is important to maintain.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Ron Wolfarth
Organization:	Rain Bird Corporation
Recommendation:	Revise text
Section Number:	414.11.1
Proposed Text:	**414.11.1 Sprinkler Heads in Common Irrigation Zones.** Sprinkler heads installed in irrigation zones served by a common valve shall be limited to applying water to plants with similar irrigation needs, and shall have matched precipitation rates (identical inches of water application per hour as rated or tested, plus or minus ~~5~~20 percent).
Problem Statement:	The state of the art in plastic molding injection, manufacturing assembly, and in the measurement of sprinkler performance is not adequate to achieve performance within the stated range.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 23, NEGATIVE: 3, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
HOFFMAN: The proponent's proposal is based on misunderstanding the pre-existing code language. The heads need only be rated within 5%, testing is not required. The proposed change would allow installer to build a system with substantial uniformity deficiencies.
KRAUSE: Based on written negative comments, I am concerned with the proposal.
PAPE: The proponent's proposal is based on misunderstanding the pre-existing code language. The heads need only be rated within 5%, testing is not required. The proposed change would allow installer to build a system with substantial uniformity deficiencies. Understand the math of "+ or - 20%: This will allow a head with .80"/hr. head to be on the same station as a 1.20"/hr. head equating to a 67% difference in the amount of water applied to the same plant material.

Name:	Kelsey Jacquard
Organization:	Hunter Industries
Recommendation:	Delete text
Section Number:	414.11.3
Proposed Text:	**414.11.3 Pop-up Type Sprinkler Heads.** Where pop-up type sprinkler heads are installed, the sprinkler heads shall pop-up to a height above vegetation level ~~and of not less than 4 inches (102 mm) above the soil level when emitting water~~. Sprinkler heads shall comply with the requirements of standard ASABE/ICC 802-2014
Problem Statement:	It is recommended for the sprinkler heads to clear the vegetation without setting a height limit. Vegetation can vary in height, and products exist for all ranges.
Referenced Standards:	ASABE/ICC 802

Note: ASABE/ICC 802 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Reject

TC SUBSTANTIATION:
The committee feels that the proposed deleted text provides important criteria to maintain.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Kelsey Jacquard
Organization:	Hunter Industries
Recommendation:	Revise text
Section Number:	414.12
Proposed Text:	**414.12 Irrigation Zone Performance Criteria.** Irrigation zones shall be designed and installed to ensure that no irrigation water runs out of the irrigation zone. ~~the average precipitation rate of the sprinkler heads over the irrigated area does not exceed 1.0 inch per hour as verified through either of the following methods:~~ ~~(a) manufacturer's documentation that the precipitation rate for the installed sprinkler head does not exceed 1.0 inches per hour where the sprinkler heads are installed no closer that the specified radius and where the water pressure of the irrigation system is no greater than the manufacturer's recommendations.~~ ~~(b) catch can testing in accordance with the requirements of the Authority Having Jurisdiction and where emitted water volume is measured with a minimum of 6 catchment containers at random places within the irrigation zone for a minimum of 15 minutes to determine the average precipitation rate, expressed as inches per hour.~~
Problem Statement:	It is recommended to eliminate the precipitation rate requirement and instead require the absence of any runoff through proper scheduling. Allowing the use of any sprinkler with the requirement of no runoff allows irrigation designers to design the best system for the landscape while promoting cycle and soak scheduling. Provided for reference: MWELO Ramesh Kumar and Eudell Vis, May 2009, Effect of Rotary Nozzles and Cycle and Soak Scheduling on Landscape Irrigation Efficiency.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATON:
Provisions stricken are important for efficiency. Proposed language is unenforceable.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
SHAPIRO: Though not enforceable, we need stricter standards, and the best standard is no runoff period. And the applicant, party needs to take all steps to prevent runoff from sprinklers.

Name:	Brent Mecham
Organization:	Irrigation Association
Recommendation:	Revise text
Section Number:	414.12
Proposed Text:	**414.12 Irrigation ~~Zone~~ System Performance ~~Criteria~~ Inspection.** The irrigation system shall be inspected to ensure the installation complies with the irrigation design and the equipment is properly adjusted and functioning correctly. Where required by the Authority Having Jurisdiction, sprinkler performance tests shall be conducted following the Irrigation Association Auditing Guidelines by a certified auditor that meets the requirements established by US EPA WaterSense Program for certifying organizations. Reports shall be submitted to the owner and Authority Having Jurisdiction where required. All items that need to be fixed and adjusted shall be completed by the installation contractor prior to acceptance. ~~Irrigation zones shall be designed and installed to ensure the average precipitation rate of the sprinkler heads over the irrigated area does not exceed 1.0 inch per hour as verified through either of the following methods:~~ ~~(a) manufacturer's documentation that the precipitation rate for the installed sprinkler head does not exceed 1.0 inches per hour where the sprinkler heads are installed no closer that the specified radius and where the water pressure of the irrigation system is no greater than the manufacturer's recommendations.~~ ~~(b) catch can testing in accordance with the requirements of the Authority Having Jurisdiction and where emitted water volume is measured with a minimum of 6 catchment containers at random places within the irrigation zone for a minimum of 15 minutes to determine the average precipitation rate, expressed as inches per hour~~
Problem Statement:	One of the most useful practices to ensure efficient irrigation is to have it inspected upon completion to verify that all of the proper components are in place and working properly. This is a benefit to the owner of the property and the information can then be shared with maintenance personnel. The Irrigation Association Recommended Audit Guidelines are attached.
Referenced Standards:	Irrigation Association Recommended Audit Guidelines-2009; US EPA WaterSense Professional Certification Program Labeling System

Note: Irrigation Association Recommended Audit Guidelines was not developed via an open process having a published development procedure in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

Note: EPA WaterSense Professional Certification Program Labeling System was not developed via an open process having a published development procedure in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Reject

TC SUBSTANTIATION:
By implementing would cause 3rd party verification and additional cost to consumer with no proven benefit.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Ron Wolfarth
Organization:	Rain Bird Corporation
Recommendation:	Delete text
Section Number:	414.12
Proposed Text:	**414.12 ~~Irrigation Zone Performance Criteria.~~** ~~Irrigation zones shall be designed and installed to ensure the average precipitation rate of the sprinkler heads over the irrigated area does not exceed 1.0 inch per hour as verified through either of the following methods:~~ ~~(a) manufacturer's documentation that the precipitation rate for the installed sprinkler head does not exceed 1.0 inches per hour where the sprinkler heads are installed no closer that the specified radius and where the water pressure of the irrigation system is no greater than the manufacturer's recommendations.~~ ~~(b) catch can testing in accordance with the requirements of the Authority Having Jurisdiction and where emitted water volume is measured with a minimum of 6 catchment containers at random places within the irrigation zone for a minimum of 15 minutes to determine the average precipitation rate, expressed as inches per hour.~~ (renumber remaining sections)
Problem Statement:	Problem 1: Sprinklers with 'lower' precipitation (application) rates tend to be less efficient because they tend to produce a higher portion of small water droplets that are more easily blown off-target by slight wind and tend to more easily evaporate before hitting the ground. These smaller water droplets have less mass. Light wind easily moves these water droplets off target. The smaller surface to mass ratio of the small water droplets exposes more surface area to the air greatly increasing evaporative water losses. Substantiation for Problem 1: The reason a Precipitation Rate limit is proposed is to reduce runoff waste. Runoff is the problem, not high Precipitation Rates. Precipitation rate limits are not the best way or even a good way to reduce or eliminate runoff waste. Irrigation systems with 1 inch per hour Precipitation Rates apply water at a rate that far exceeds the Infiltration Rate of all non-manufactured soils. Therefore, runoff is not eliminated. Runoff will simply start a short time later compared to an irrigation system with, say, a 2.0 inch per hour Precipitation Rate. Cycle run times must be reduced in order to eliminate runoff and precipitation rate limits alone do not address this. It is a faulty notion that prohibiting higher Precipitation Rate (but perhaps highly efficient) sprinklers will conserve water. There are many, significant negative consequences to limiting precipitation rates. A) Wind Drift and Evaporation: Wind Drift and Evaporation are shown to be increased when using sprinklers with lower Precipitation Rates which tend to generate a greater proportion of smaller water droplets. The Science: In a study[1] conducted by University of Arizona and summarized in a White Paper by Randy Montgomery[2] and in a presentation by Randy Montgomery at the Irrigation Association Trade Show and Conference in 2013[3], it is shown that two spray sprinklers had very different performance in outdoor wind conditions despite having very similar performance in outdoor zero wind conditions. The more efficient sprinkler with a Precipitation Rate of 1.6 inches per hour applied 20% more of its water to the target area in a 5 mph wind compared to the sprinkler with a Precipitation Rate of 1.0 inch per hour. More Science: A study conducted by California State Polytechnic University, Pomona[4] found that 76 - 83% of runoff is due to wind, even at wind speeds of 0 - 5 mph. This study was performed with (low precipitation rate) multi-stream, multi-trajectory nozzles and (high precipitation rate) spray nozzles. B) Extended Run Times: Low Precipitation Rate systems will extend the schedule

run time needed to apply the budgeted amount of water. This causes more of the irrigation to happen during worsening wind conditions. For example, in Los Angeles and San Diego, the ideal time to irrigate is between 5:00 and 6:00 AM when wind speed is approximately 1 - 2 mph.[5] The average daily wind speed in those areas is 5 mph or higher[6], the speed at which the low Precipitation Rate sprinkler in the University of Arizona study applied only about 63% of its water to the target area. The lower the Precipitation Rate limit imposed, the more irrigation will happen during windier, inefficient times. C) Restrictions on solutions for large turf areas: Many of the highly efficient, larger area turf sprinklers used to irrigate parks, schools, sports fields and golf courses would be eliminated from use. Many have Precipitation Rates higher than 1.0 inch per hour, especially when used in part circle operation. These rotors are the most efficient means of irrigating these spaces. Sprinklers in golf course playing surfaces would often have to be full-circle sprinklers located near the edge of the playing surface in order to provide adequate water to the turf. This would cause excessive overspray onto non-playing surfaces where it has less beneficial use. There is existing, affordable control technology on the market today from several manufacturers that eliminates runoff waste. A) The most effective solution to eliminating runoff waste is to break irrigation run times into short cycles that stop before runoff begins, pausing irrigation to allow water to soak in and then repeating the pattern until the irrigation requirement is met. There are products on the market today that accomplish this with no user intervention or change in user behavior. Section 414.5 of this proposed addresses the requirements for these control systems. B) The Science: The study conducted at California State Polytechnic University, Pomona[4] showed that using short cycles and soak times resulted in reducing runoff to about 0.25% of total water applied when using high and low precipitation rate sprinklers. In other words, 99.75% of the water applied did not runoff regardless of the sprinklers' Precipitation Rate when proper Irrigation Management was employed. This can be accomplished automatically with no user intervention or change in behavior. The low precipitation rate sprinklers used in the study were multi-stream, multi-trajectory nozzles and conventional, spray heads. Automation with Available Products: Irrigation controllers on the market today from several manufacturers allow the user to limit cycle time to eliminate runoff. The only expertise required is during the installation and set-up time. This level of expertise is reasonable to expect. Products can be chosen that require no change in end-user behavior. Conclusions: 1) Lower Precipitation Rates will only delay the start of runoff and not eliminate it because no soil aside from manufactured putting greens and manufactured sports fields can absorb water at the rate of 1.0 inch per hour. 2) Imposing Precipitation Rate limits ignores the very significant water waste due to Wind Drift and Evaporation losses that tend to increase as Precipitation Rate is lowered. 3) Even low Precipitation Rate sprinklers require management via the controller to eliminate runoff due to the infiltration rate of the soil, so why deny irrigators the right to use the most efficient irrigation solutions possible? The benefits of a Precipitation Rate limit are greatly over-shadowed by the negative consequences. 4) Irrigation Management strategies have been shown in university research to completely eliminate runoff regardless of the Precipitation Rate of the sprinklers used. 5) Products on the market today make the employment of Irrigation Management strategies that completely eliminate runoff easy for the end-user and require only reasonable expertise on the part of the installer. The proposed standard requires a "Smart Controller." Adding a requirement that it allow the user to set a maximum cycle time per zone as suggested above would solve the problem of runoff. 6) Science supports these conclusions. 7) Do not settle for a partial, weak, ineffective measure to only reduce runoff while harming irrigation water efficiency.

Provided for reference:
Notes: [1] Assessment of Application Efficiency and Uniformity of Fixed Spray and Multi-Stream Report Apr 2013 Brown Gilbert
[2] Wind Effects on Sprinkler Irrigation Performance Manuscript -Randy Montgomery
[3] Lets take it outside - Randy Montgomery IA 2013 Presentation

	[4] Effect of Nozzles and Cycle and Soak Scheduling on Landscape Irrigation Efficiency-Kumar-Vis [5] https://weatherspark.com [6] http://www.ncdc.noaa.gov/sites/default/files/attachments/wind1996.pdf
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Text is not appropriate for deletion at this time.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Brent Mecham
Organization:	Irrigation Association
Recommendation:	Relocate and Revise text
Section Number:	414.13 relocating to 414.1.1
Proposed Text:	~~**414.1.13**~~ **414.1.1** ~~**Qualifications.**~~ **Irrigation Design and Installation.** The Authority Having Jurisdiction shall have the authority to require landscape irrigation contractors, installers, or designers to demonstrate competency. The system shall be designed and record drawings showing changes during installation shall be made available for the owner and for any required inspections. Where required by the Authority Having Jurisdiction, the contractor, installer, or designer shall be licensed, certified, or both to perform such work.
Problem Statement:	Propose moving this subsection forward into the section to emphasize the use of irrigation professionals and the expectation that an irrigation plan and record drawings by the installation contractor are important, but subject to the requirements of the AHJ.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	501.2
Proposed Text:	**501.2 System Design.** Alternative water source systems shall be designed in accordance with this chapter by a licensed contractor or designer, ~~person registered or licensed to perform plumbing design work or~~ who demonstrates competency to design the alternate water source system as required by the Authority Having Jurisdiction. Components, piping, and fittings used in any alternate water source system shall be listed.
Problem Statement:	Rational: These systems are often designed by engineers, or landscape contractors, or architects. Plumbing contractors are less knowledge about the irrigation portion of the system and so should not be called out as a preferred designer.
Referenced Standards:	

TC ACTION:
Accept as amended:

501.2 System Design. Alternative water source systems shall be designed in accordance with this chapter by a ~~licensed contractor or designer~~ registered design professional or a person, who demonstrates competency to design the alternate water source system as required by the Authority Having Jurisdiction. Components, piping, and fittings used in any alternate water source system shall be listed.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 22, NEGATIVE: 4, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
KRAUSE: I support the modification. It is not so important that someone be licensed, but more important that they demonstrate competency in designing these systems.

EXPLANATION OF NEGATIVE:
MAJEROWICZ: A license plumber should be able to design these systems.
MANN: One of the only people qualified is a plumbing contractor.
PAPE: Not listing the licensed contractor in the paragraph is a mistake. The licensed contractor is NOT the only competent installer, but certainly the most obvious qualified person to do the work.
RAWALPINDIWALA: Prefer the original language.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	501.3
Proposed Text:	**501.3 Permit.** It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any alternative water source system in a building or on a premise without first obtaining a permit to do such work from the Authority Having Jurisdiction. **Exception:** A construction permit shall not be required for a clothes washer only system meeting the requirements of Section 501.3.1
Problem Statement:	Clothes washer only systems that do not alter the existing plumbing (and follow basic health and safety guidelines) are extremely low risk and should be allowed to be installed with no permit. California has had great success with this code and there are many incentive programs across the state for the clothes washer graywater system due to its permit-exempt status. Chapter 16 from the CPC is provided for reference.
Referenced Standards:	

TC ACTION:
Accept as amended:

501.3 Permit. It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any alternative water source system in a building or on a premise without first obtaining a permit to do such work from the Authority Having Jurisdiction.
Exception: For single family dwellings ~~A~~ a construction permit shall not be required for a clothes washer only system meeting the requirements of Section 501.3.1.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MAJEROWICZ: Same as Dave [Mann], systems need to be inspected
MANN: There should always be a required permit. This is not protecting the health and safety of the pubic.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Add text
Section Number:	501.3.1
Proposed Text:	**501.3.1 Clothes Washer System.** A clothes washer system in compliance with all of the following is exempt from the construction permit specified in Section 501.3 and may be installed or altered without a construction permit: (1) Where required, notification has been provided to the enforcing agency regarding the proposed location and installation of a gray water irrigation or disposal system. (2) The design shall allow the user to direct the flow to the irrigation or disposal field or the building sewer. The direction control of the gray water shall be clearly labeled and readily accessible to the user. (3) The installation, change, alteration, or repair of the system does not include a potable water connection or a pump and does not affect other building, plumbing, electrical, or mechanical components including structural features, egress, fire-life safety, sanitation, potable water supply piping, or accessibility. The pump in a clothes washer shall not be considered part of the gray water system. (4) The gray water shall be contained on the site where it is generated. (5) Gray water shall be directed to and contained within an irrigation or disposal field. (6) Ponding or runoff is prohibited and shall be considered a nuisance. (7) Gray water shall be permitted to be released above the ground surface provided at least 2 inches (51 mm) of mulch, rock, or soil, or a solid shield covers the release point. Other methods which provide equivalent separation are also acceptable. (8) Gray water systems shall be designed to minimize contact with humans and domestic pets. (9) Water used to wash diapers or similarly soiled or infectious garments shall not be used and shall be diverted to the building sewer. (10) Gray water shall not contain hazardous chemicals derived from activities such as cleaning car parts, washing greasy or oily rags, or disposing of waste solutions from home photo labs or similar hobbyist or home occupational activities. (11) Exemption from construction permit requirements of this code shall not be deemed to grant authorization for any gray water system to be installed in a manner that violates other provisions of this code or any other laws or ordinances of the Authority Having Jurisdiction. (12) An operation and maintenance manual shall be provided to the owner. Directions shall indicate that the manual is to remain with the building throughout the life of the system and upon change of ownership or occupancy. (13) Gray water discharge from a clothes washer system through a standpipe shall be properly trapped in accordance with the plumbing code.
Problem Statement:	Clothes washer only systems that do not alter the existing plumbing (and follow basic health and safety guidelines) are extremely low risk and should be allowed to be installed with no permit. California has had great success with this code and there are many incentive programs across the state for the clothes washer graywater system due to its permit-exempt status. Chapter 16 from the CPC is provided for reference.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MAJEROWICZ: Systems need to be inspected.
MANN: Nothing should be installed without permits. The requirements listed are unenforceable. No scientific documentation. There was no substantiation submitted to show that California has had great success and what the incentives are.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	501.5
Proposed Text:	**501.5 Maintenance and Inspection.** Alternate water source systems and components shall be inspected and maintained in accordance with ~~Section 501.5.1 through Section 501.5.3.~~ the manufacturer's recommendations, as required by the Enforcing Agency or both.
Problem Statement:	Rational: There are many different system components that will potentially be used in a system and so any generic maintenance chart will be potentially erroneous and could add unnecessary required maintenance. Requiring systems to be maintained and inspected in accordance with the manufacturer is a simple and more effective way to achieve the same goal of having well maintained systems.
Referenced Standards:	

TC ACTION:
Accept as amended:

501.5 Maintenance and Inspection. Alternate water source systems and components shall be inspected and maintained in accordance with Section 501.5.1 through Section 501.5.3, the manufacturer's recommendations, or as required by the ~~Enforcing Agency~~ Authority Having Jurisdiction ~~or both~~.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

WE-Stand 2017 – (Table 501.5) Item # 090

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	Table 501.5
Proposed Text:	~~**Table 501.5 Minimum Alternate Water Source Testing, Inspection, and Maintenance Frequency**~~ delete the table in its entirety
Problem Statement:	There are many different system components that will potentially be used in a system and so any generic maintenance chart will be potentially erroneous and could add unnecessary required maintenance. Requiring systems to be maintained and inspected in accordance with the manufacturer is a simple and more effective way to achieve the same goal of having well maintained systems.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The committee feels that Table 501.5 provides needed guidance.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	501.5.1
Proposed Text:	~~**501.5.1 Frequency.** Alternate water source systems and components shall be inspected and maintained in accordance with Table 501.5 unless more frequent inspection and maintenance is required by the manufacturer.~~ (renumber remaining sections)
Problem Statement:	This section is unnecessary. The frequency of maintenance should be done in accordance with the manufactures recommendations.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The committee noted that some systems are designed by the user or someone other than a manufacturer and there are no manufacturer recommendations to consult. In addition, a minimum set of requirements for inspection and maintenance are considered to be important.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	501.5.2
Proposed Text:	~~**501.5.2 Maintenance Log**. A maintenance log for gray water and on-site treated non-potable water systems is required to have a permit in accordance with Section 501.3 and shall be maintained by the property owner and be available for inspection. The property owner or designated appointee shall ensure that a record of testing, inspection and maintenance as required by Table 501.5 is maintained in the log. The log will indicate the frequency of inspection and maintenance for each system.~~ (renumber remaining sections)
Problem Statement:	Rational: This is an onerous requirement and there is no similar requirements for other comparable systems (drinking water wells, septic systems, hot tubs, swimming pools, etc.)
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The committee feels that requiring a maintenance log for a permit when installing graywater and on site treated nonpotable water systems is necessary to protect health and safety.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NOT RETURNED: 3 Gray, Sovocool, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	501.6
Proposed Text:	**501.6 Operation and Maintenance Manual.** An operation and maintenance manual for gray water and on-site treated water systems required to have a permit in accordance with Section 501.3 shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following: (1) ~~Detailed d~~Diagram of the entire system and the location of system components. (2) (remaining text unchanged) (3) Details on maintaining the required water quality~~ as determined by the Authority Having Jurisdiction.~~ for on-site non potable water systems. (4) – (6) (remaining text unchanged) (7) Directions to the owner or occupant that the manual shall remain with the building throughout the life of the structure.
Problem Statement:	(1) The diagram of the entire system is a "site plan" which is not a detailed drawing, rather a drawing that shows all the components and their locations. Each component may have it's own detailed cut-sheets, but this is not the place to include that level of detail. (3) It should be clarified that the water quality is addressed in this code. (7) This addition should be added so the system owner knows they must pass on the O&M manual to future owners.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: The added text is unenforceable.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	501.7
Proposed Text:	**501.7 Minimum Water Quality Requirements.** The minimum water quality for alternate water source systems shall meet the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction. In the absence of water quality requirements for on-site treated non-potable gray~~gray~~water and reclaimed (recycled) water systems, ~~the EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies develop, revise, or expand alternate water source water quality standards.~~ the requirements of NSF 350 shall apply.
Problem Statement:	This would be consistent with California's non-potable reuse standards and would make it easier for projects to permit NSF 350 certified systems. Since most jurisdictions do not have the time, resources, or technical expertise to develop their own standards, the result of not including an outside standard like NSF 350 will result in more difficulty in permitting these systems.
Referenced Standards:	NSF-350 2011

Note: NSF 350 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept as amended:

501.7 Minimum Water Quality Requirements. The minimum water quality for alternate water source systems shall meet the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction. In the absence of water quality requirements for on-site treated non-potable ~~gray~~water ~~and reclaimed (recycled) water~~ systems, the water quality requirements of NSF 350 or the EPA/625/R-04/108 shall apply.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: The reference to EPA/625/R-04/108 should be stricken. As stated this is only a guideline and not a standard.
SIGLER: I agree with Mr. Mann's comment. EPA/625/R-04/108 is not a standard, but a guideline.

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	501.8
Proposed Text:	**501.8 Material Compatibility.** Alternate water source systems shall be constructed of materials that are compatible with the type of pipe and pipe fitting materials, water treatment, and water conditions in the system.
Problem Statement:	• Clarification of the term ‘fitting’ as it is not included in CHAPTER 2: DEFINITIONS. • Clarification of the term ‘fitting’ so that it does not imply synonymy with faucet materials.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	501.10
Proposed Text:	**501.10 Commercial, Industrial, and Institutional Restroom Signs.** A sign shall be installed in all restrooms in commercial, industrial, and institutional occupancies using reclaimed (recycled) water and on-site treated water for water closets, urinals, or both. ~~Each sign shall contain 1/2 inch (12.7 mm) letters of a highly visible color on a contrasting background.~~ The location of the sign(s) shall be such that the sign(s) shall be visible to all users. The location of the sign(s) shall be approved by the Authority Having Jurisdiction and shall contain the following text: TO CONSERVE WATER, THIS BUILDING USES *_____* TO FLUSH TOILETS AND URINALS.
Problem Statement:	Rational: The size of the letters may differ depending on how close or far away the sign is. Having such a specific requirement seems unnecessarily rigid here.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Committee believes the requirements are appropriate.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 20, NEGATIVE: 5, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
ALLEN: I agree with Kent Sovocool's comment and my original comments.
HOFFMAN: 1/2 inches or GREATER would establish a minimum letter size.
SHAPIRO: Less oversight from govt.
SOVOCOOL: Specifying the size of the letters and the background color to the sign does seem onerous as noted by the commenter.
YEGGY: I agree with Kent Sovocool.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	501.11
Proposed Text:	**501.11 Inspection and Testing**. Alternate water source systems shall be inspected and tested in accordance with Section 501.11.1 and Section 501.11.2. **Exception**: Non-pressurized graywater or on-site non potable water systems without any connection to a pressurized water system.
Problem Statement:	Rational: Non-pressurized systems without any connection to a pressurized water systems would not require inspection for cross-connection nor inspection for testing potable water piping.
Referenced Standards:	

TC ACTION:
Accept as amended:

501.11 Inspection and Testing. Alternate water source systems shall be inspected and tested in accordance with Section 501.11.1 and Section 501.11.2.
Exception: Non-pressurized graywater or on-site non potable water systems without any connection to a ~~pressurized~~ potable water system.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	501.11.2.2
Proposed Text:	**501.11.2.2 Cross-Connection Test.** The procedure for determining cross-connection shall be followed by the applicant in the presence of the Authority Having Jurisdiction ~~and other authorities having jurisdiction~~ to determine whether a cross-connection has occurred as follows:
Problem Statement:	• It is implied that throughout this standard, the Authority Having Jurisdiction may include subsequent authorities having jurisdiction depending on the application. • If 'and other authorities having jurisdiction' is desired to be left in the text, it should also be used throughout the rest of this standard for consistency.
Referenced Standards:	

Staff Note: Similar language is found in: 501.11.2.1, 504.5, 602.5, 602.11.2.1, 602.11.2.2

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Edward Saltzberg
Organization:	Edward Saltzberg & Associates
Recommendation:	Add text
Section Number:	502.1.2-502.1.2.3
Proposed Text:	**502.1.2 Required.** Every newly constructed single family dwelling shall have the waste piping from all fixtures allowed on a gray water system per the Code. The separate piping system shall be piped to outside the building and terminate with an approved drainage gray water diverter per Section 502.2.3 before connecting to the drainage system from non-gray water fixtures. **Exception** – Existing single-family dwellings and any residence built on soil that will not support percolation. **502.1.2.1 Diverter.** The diverter shall be connected and installed in the open position to the building sewer. The gray water diversion port shall remain capped off until a gray water irrigation/reuse system is installed. **502.1.2.2 Access.** The diverter and sewer connection shall be readily accessible for connection, inspection, maintenance, and servicing. **502.1.2.3 Regulatory.** Gray water reuse and irrigation system components shall meet local, and state code and regulatory requirements.
Problem Statement:	Justification: The document has made great strides in saving energy in new buildings. Codes have made provisions for future solar panels and instantaneous water heaters all to save energy. However, while the Codes address water flows from fixtures, it does not address the water savings that can accrue from capturing the waste water from fixtures allowed on the gray water system. The installation of a total gray water system in a single family dwelling would save each dwelling considerable water, far more water than the low flow shower heads and conversion to ultra-low flow toilets save. The State of California and many other locations are facing a long term drought and we need to conserve water. Total gray water systems cannot be installed unless the waste piping from all the fixtures allowed on a gray water system are piped together to outside the building initially as part of the original dwelling construction. It would be cost prohibitive to try to implement a total gray water system for all the allowed fixtures after the building is built, especially if the house is a slab on ground construction. There is a direct relationship between water use and energy use. Much of the use of energy in the State is for moving water. If each new single family dwelling had an approved gray water system installed, considerable water to each dwelling would be saved so that their water bills would be reduced and their sewer surcharge bills would also be reduced. Furthermore, the water utilities would be delivering less water and sewage treatment plants would be treating less sewage thereby saving considerable energy. Furthermore, this might even negate the requirement for agencies to enlarge their water systems and increase their sewage treatment plants.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The proposed wording does not reflect what needs to happen in construction. Proposal may add confusion with signage regarding which is gray water and which is black water. Proposal considered incomplete as provided.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 1, ABSTENTION: 1, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
ALLEN: This is an important proposal and I look forward to seeing the revised language.
PAPE: The revised proposal should be submitted during public comment period.

EXPLANATION OF NEGATIVE:
SALTZBERG: I submitted a revised worded code change that incorporated all of the comments I heard from the committee.

COMMENT ON ABSTENTION:
HOFFMAN: I like the concept in a green code of requiring new residential construction to be gray water ready, but we need to work on this more.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.2.1
Proposed Text:	**502.2.1 Discharge.** Gray water diverted away from a sewer or private sewage disposal system, shall discharge to a subsurface irrigation or subsoil irrigation system, or ~~shall discharge~~ to a mulch basin ~~for single family and multi-family dwellings~~. Gray water shall not be used to irrigate root crops or food crops intended for human consumption that come in contact with soil.
Problem Statement:	Rational: Mulch basis are very effective at preventing pooling and runoff of graywater and should be allowed to be used in any suitable location regardless of whether it's single family or multi-family. There are commercial-scale much basins systems functioning well in California and to disallow it for no good reason doesn't make sense.
Referenced Standards:	

TC ACTION:
Accept as amended:

502.2.1 Discharge. Gray water diverted away from a sewer or private sewage disposal system, shall discharge to a subsurface irrigation or subsoil irrigation system, ~~or to a~~ mulch basin, or disposal field. Gray water shall not be used to irrigate root crops or food crops intended for human consumption that come in contact with soil.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 20, NEGATIVE: 5, ABSTENTION: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
KOELLER: Concur with the comments offered by Thomas Pape.
MANN: The current language should remain. Any commercial facility may have mulch basins. This would go through plan check and be approved on a case by case basis by the AHJ.
MECHAM: I concur with Tom Pape and there is no way to enforce what crops are planted in the future, so the possibility of toxins affecting food production will likely increase overtime.
PAPE: My argument is about toxic food. The restriction to residential should remain in the requirements. The disposal from homes of high concentrations of toxins into the gray water system is relatively low and unlikely to systemically enter the food supply. Commercial setting are likely to include many dangerous toxins on-site and the risk of someone disposing them into a fixture attached to a gray water system is much higher. The use of non-residential gray water for irrigation of food should be strictly prohibited.
RAWALPINDIWALA: Agree with other comments.

COMMENT ON ABSTENTION:
DIGIOVANNI: Abstain

Name:	Edward Saltzberg
Organization:	Edward Saltzberg & Associates
Recommendation:	Revise text
Section Number:	502.2.3
Proposed Text:	**502.2.3 Diversion.** The gray water system shall connect to the sanitary drainage system downstream of fixture traps and vent connections through ~~a~~ an approved gray water diverter valve. The gray water diverter shall comply with IAPMO PS 59 and be installed in an accessible location and clearly indicate the direction of flow.
Problem Statement:	To clarify matters.
Referenced Standards:	IAPMO PS 59

Note: IAPMO PS 59 does not meet the requirements for a mandatory reference standard in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
MANN: The reference to IAPMO PS 59 should be stricken.

EXPLANATION OF NEGATIVE:
ALLEN: There is only one "approved graywater diverter valve" on the market and it's less functional than the currently used "approved diverter valves" for several reasons. I give more explanation to it's drawbacks on item #103. This code shouldn't be written in such a way that people have only one option for the valve.
KRAUSE: I agree with Laura, this section is problematic as there are other approved valves which are not "gray water" diverter valves. Sections like this make it more difficult than necessary to design and build gray water systems. Additionally a gray water diverter valve is not inherently safer than other listed valves.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.2.3
Proposed Text:	**502.2.3 Diversion**. The gray water system shall connect to the sanitary drainage system downstream of fixture traps and vent connections through an approved ~~gray water~~ diverter valve. The ~~gray water~~ diverter shall ~~comply with IAPMO PS 59 and~~ be installed in an accessible location and clearly indicate the direction of flow. **Exception:** A clothes washer system in compliance with section 501.3.1.
Problem Statement:	Rational: There is only one valve that is listed with IAPMO's PS 59 standard. The valve is newly on the market, costs 10 times more than the other valves, and is not suitable for many situations. Requiring this particular valve to be used will double the cost of simple greywater systems and create additional installation challenges, and thus will discourage legal installations. This valve should be an option for installers who wish to use it, but no code should be written in such a way this valve by default becomes the only option. The other valves that are currently used (Jandy and Pentair 3-way valves) cost $50 and require a 7" section of straight pipe to be removed for installation, and they have been used without problems for decades. The GreenSmart valve (the only approved "graywater valve") costs $500 and requires about 16" of straight section of pipe. In a retrofit situation without a lot of room to alter the drain, the need of 16" of straight pipe to install the valve will require major plumbing alteration, which is greatly increase the cost of the system. Other issues with the valve are: This valve has a 2" inlet and outlet, but the graywater outlet is 1.5" which is undersized for a shower drain. This valve relies on one ball valve that blocks off the sewer/septic side, so if the user doesn't switch to the sewer on a frequent basis a ball of sludge will build up, creating a blockage. Additionally, I've used this valve and the 4th time it was engaged the motor never stopped spinning. Since this was in a classroom situation we noticed and directed the valve the other direction, which fixed the problem. However, if this valve had been installed and was in operation the user would never have known the valve was spinning endlessly, all the graywater would have been wasted to the sewer, and the motor would have burned up. The valve is so new and has so many drawbacks compared to the other diverter valves that have been used, that writing the code in such a way to require it is highly problematic and would be a huge disservice to water conservation in the US.
Referenced Standards:	

TC ACTION:
Accept as amended:

502.2.3 Diversion. The gray water system shall connect to the sanitary drainage system downstream of fixture traps and vent connections through a~~n approved~~ diverter valve(s) approved by the Authority Having Jurisdiction. The diverter shall be installed in an accessible location and clearly indicate the direction of flow.
Exception: A clothes washer system in compliance with section 501.3.1.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 22, NEGATIVE: 3, ABSTENTION: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: I am opposed to the exception. This does not protect the health and safety of the public.
SALTZBERG: I do not believe that any kind of valve should be approved for this use.
TINDALL: I don't agree with the exception the argument was over costs not protecting health and safety.

COMMENT ON ABSTENTION:
HOFFMAN: We need to look at the type of valve to use one more time.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.3
Proposed Text:	**502.3 Connections to Potable and Reclaimed (Recycled) Water Systems.** Gray water systems shall have no unprotected direct connection to any potable water supply, on-site treated non-potable water supply, or reclaimed (recycled) water systems. Potable, on-site treated non-potable, rainwater or reclaimed (recycled) water is permitted to be used as makeup water for a non-pressurized storage tank provided the connection is protected by an airgap, reduced-pressure principle backflow preventer, or other device which prevents backflow in accordance with the plumbing code.
Problem Statement:	Rational: This section should be consistent with the rest of the sections of this code. These edits create that consistency and allow for different protected options in accordance with the plumbing code.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: This section is specifically for gray water and protected or not there should be no direct connection. The section, as written, does protect public health and safety.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.7
Proposed Text:	**502.7 Drawings and Specifications.** The Authority Having Jurisdiction shall be permitted to require any or all of the following information to be included with or in the plot plan before a permit is issued for a gray water system, or at any time during the construction thereof:
Problem Statement:	Rational: Depending on the level of complexity of the system not all of these requirements would be necessary. Changing "shall" to "may" will give the AHJ flexibility to require any or all of these items, as fits the specific system and situation.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The new text is not necessary.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, ABSTENTION: 1, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON ABSTENTION:
ALLEN: Softening the language would enable the AHJ to choose the appropriate level of documentation for the specific system at hand. Too many mandatory requirements makes the permits economically unfeasible for the smaller, simpler, residential systems.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.8.1
Proposed Text:	**502.8.1 Single Family Dwellings and Multi- Family Dwellings.** The gray water discharge for single family and multi-family dwellings shall be calculated by water use records, calculations of local daily per person interior water use, or the following procedure: (1) The number of occupants of each dwelling unit shall be calculated as follows: First Bedroom 2 occupants Each additional bedroom 1 occupant (2) The estimated gray water flows of each occupant shall be calculated as follows: ~~Showers, bathtubs and lavatories~~ ~~25 gallons (95 L) per day/ occupant~~ ~~Laundry~~ ~~15 gallons (57 L) per day/ occupant~~ **With no water-efficient fixtures:** Shower/bath 13 gallons (49 L) per day/occupant Lavatory sink 7 gallons (26 L) per day/occupant Washing machine 15 gallons (57 L) per day/occupant **With water-efficient fixtures:** Shower/bath 10 gallons (38 L) per day/occupant Lavatory sink 5 gallons (19 L) per day/occupant Washing machine 10 gallons (38 L) per day/occupant (3) The total number of occupants shall be multiplied by the applicable estimated gray water discharge as provided above and the type of fixtures connected to the gray water system. Note: If a system designer calculates the home produces more graywater than estimated by this chart, the system should be designed for the highest estimate of gallons per day.
Problem Statement:	Rational: The numbers in this standard are from the original CA graywater code which is almost 20 years old (25 gpd for showers/lav and 15 gpd for washers). Many homes have upgraded to water efficient fixtures, and the water efficiency requirements of this same standard would cause homes to generate much lower flows than in this estimate. The code should accurately reflect the current average gallons per day per occupant. Additionally the bathroom sink should have a separate number since many systems do not include it. Graywater systems should not have to be designed for fixtures that are not connected to the system. The numbers I'm suggesting come from LEED estimates (3 minute usage per person per day from the lavatory sink with either a 2.2 gpm or 1.5 gpm), Residential End Uses of Water (Denver, CO : AWWA Resource Foundation, 1999); and Handbook of Water Use and Conservation, Amy Vickers (WaterPlow Press, 2012).
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The committee questions the accuracy of the proposed calculations. The proponent is required to substantiate the values.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, ABSTENTION: 1, NOT RETURNED: 3 Gray, Tabakh, Tindall

COMMENT ON ABSTENTION:
ALLEN: The numbers in the current standard are outdated and inaccurate based on current estimates.
The newly released "Residential End Use of Water Version 2" reports: Clothes washer: 9.6 gpcd;
Showers: 11.1 gpcd; Baths: 1.5 gpcd
They don't specify sink type, and report all faucets at 11.1 gpcd
I would revise this proposal to include these updated estimates.
http://www.waterrf.org/PublicReportLibrary/4309A.pdf

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.9.1
Proposed Text:	**502.9.1 Surge Tanks.** Where installed, surge tanks shall comply with the following: (1) – (4) Text unchanged (5) Where possible, ~~Each~~ surge tanks shall have an overflow drain. The overflow drains shall have permanent connections to the building drain or building sewer, upstream of septic tanks, if any. The overflow drain shall not be equipped with a shutoff valve. (6) – (7) Text unchanged (8) ~~If~~ Where a surge tank is installed underground, the system shall be designed so that where possible, the tank overflow will gravity drain to the existing sewer line or septic tank. When subject to backflow ~~T~~the tank shall be protected ~~against sewer line backflow~~ by a backwater valve installed in accordance with the plumbing code. (9) – (10) Text unchanged
Problem Statement:	Rational: Sewage ejection tanks don't have this requirement. If tanks containing sewage can be installed legally without overflow to sewer why shouldn't greywater tanks also be allowed?
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Proposal is unclear as written. The proponent is asked to clarify language.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.9.2
Proposed Text:	**502.9.2 Gray Water Pipe and Fitting Material.** Aboveground and underground building drainage and vent pipe and fittings for gray water systems shall comply with the requirements for aboveground and underground sanitary building drainage and vent pipe and fittings in the plumbing code. ~~These materials shall extend not less than 2 feet (610 mm) outside the building.~~
Problem Statement:	Rational: Some systems pumped the greywater through irrigation tubing from inside the building envelope or very nearby. These systems wouldn't use drainage piping 2 feet outside the building.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
All plumbing within 2 feet of the building needs to comply with the plumbing code.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.9.7
Proposed Text:	**502.9.7 Backwater Valve.** A backwater valve shall be installed on all gray water drain connections to the sanitary drain or sewer that are subject to backflow.
Problem Statement:	Rational: Not all drains are subject to backflow and won't require a backwater valve, for example, a retrofit installation of a shower graywater line that comes from a second story shower and runs on the exterior of the house. The diversion can happen outside higher than any potential backflow point and would not require a backwater valve.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 14, NEGATIVE: 10; ABSTENTION: 1, NOT RETURNED: 3 Gray, Steffensen, Tabakh

NOTE: Item #109 failed to achieve the necessary 2/3 affirmative vote of returned ballots. In accordance with Section 6.8.2 of the Regulations Governing Consensus Development of WE•Stand, a public comment is requested for this proposal. The technical committee will reconsider this proposal as a public comment.

EXPLANATION OF NEGATIVE:
HOFFMAN: Backflow valves should always be required. Who knows what future home owners will connect to.
KRAUSE: Backwater valves are important to system design and construction to prevent backflow of.
MANN: Who will determine whether or not they will be subject to backflow? The cost of a backwater valve is nothing compared to the cost of clean-up.
MECHAM: Using a backwater valve is good practice.
PAPE: The backwater valve is needed to prevent the gray water from being contaminated without the user realizing the backflow occurred.
RAWALPINDIWALA: Backflow valves should always be required.
SALTZBERG: I think that anytime that the grey water system is connected to a sewer line there should be a back water valve installed.
SIGLER: How does one determine if a gray water connection is subject to backflow?
SOVOCOOL: Permissive language.
YEGGY: Not clear how it will determine if the line is not subject to backflow.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	Table 502.10

Proposed Text:

TABLE 502.10
DESIGN OF SIX TYPICAL SOILS

TYPE OF SOIL	MINIMUM SQUARE FEET OF IRRIGATION AREA PER 100 GALLONS OF ESTIMATED GRAY WATER DISCHARGE PER DAY	MAXIMUM ABSORPTION CAPACITY IN GALLONS PER SQUARE FOOT OF IRRIGATION/LEACHING AREA FOR A 24-HOUR PERIOD
~~Coarse sand or gravel~~	~~20~~	~~5.0~~
Sand	25	4.0
~~Fine sand~~	~~25~~	~~4.0~~
Sandy loam	40	2.5
Loam	50	2
Clay loam	63	1.6
Sandy clay	60	1.7
Clay	100	1
~~Clay with considerable sand or gravel~~	~~90~~	~~1.1~~
~~Clay with small amounts of sand or gravel~~	~~120~~	~~0.8~~

Problem Statement:	The soil types in this chart are not "typical" and are not even consistent with Table 502.11.1 Subsurface Irrigation Design Criteria for Six Typical Soils. These six soil types should be used in this table.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
No documentation was submitted to support the proposal.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 20, NEGATIVE: 5, ABSTENTION: 1, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
KRAUSE: Proponent should consider proposal to UPC.

EXPLANATION OF NEGATIVE:
ALLEN: Several of the soils currently listed are not even official soil types. What type of documentation would the committee feel is valid?
KOELLER: Agree with comment of Brent Mecham.
MECHAM: We should use realistic soil types that come from traditional soils charts.
SHAPIRO: Update the requirements to meet latest documentation. Make more in line with present knowledge.
YEGGY: Agree with comment of Brent Mecham.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.10.3
Proposed Text:	**502.10.3 Groundwater Level.** No excavation for an irrigation field, disposal field, or mulch basin shall extend within 3 feet (914 mm) vertical of the highest known seasonal groundwater level, nor to a depth where gray water contaminates the groundwater or surface water. ~~The applicant shall supply evidence of ground- water depth to the satisfaction of the Authority Having Jurisdiction.~~ **Exceptions**: The absence of groundwater in a test hole 3 vertical feet (915 mm) below the deepest irrigation or disposal point shall be sufficient to satisfy this section unless seasonal high groundwater levels have been documented to rise within this area.
Problem Statement:	Rational: Supplying evidence of groundwater depth to the satisfaction of the AHJ is an unreasonable requirement. In areas with deep groundwater it would costs tens of thousands of dollars to "prove" where groundwater was (they would have to drill until hitting the water table). The language I'm suggesting is from Chapter 16 of the California Plumbing Code and it prevents local regulators from preventing any systems being installed because it's too costly to prove where groundwater is. It's not hard or expensive to prove where groundwater isn't- you just have to dig a hole. Chapter 16 of the CPC provided for reference.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The proposal is inconsistent with provisions contained in the UPC.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 23, NEGATIVE: 3, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
PAPE: It is highly unlikely an AHJ would require test drilling where the groundwater is known to be hundreds of feet below surface.

EXPLANATION OF NEGATIVE:
ALLEN: This provision used to be in the California plumbing code and was a major barrier to legal graywater installations in some jurisdictions. If the groundwater table is hundreds of feet down and a local regulator requires proof of where the location is, the installer would have to hire a drilling company to drill until they reached the water, costing tens of thousands of dollars. That alone will prevent anyone from being able to afford a permit. Proving where groundwater ISN'T, addresses concerns of potential groundwater pollution from graywater, but isn't economically unfeasible.
KRAUSE: I agree with problem statement. Requiring evidence of groundwater depth is unreasonable.
SHAPIRO: Make less restrictive and more user-friendly for applicant.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	502.11.1.1
Proposed Text:	~~**502.11.1.1 Minimum Depth.** Supply piping, including drip feeders, shall be not less than 2 inches (51 mm) below finished grade and covered with mulch or soil.~~ Renumber remaining sections
Problem Statement:	Rational: Supply piping may come from a locations where the pipe runs under the building, along a wall, where it is impossible to make it below grade. The supply piping doesn't release any greywater so there is no health reason for it to be buried. The outlets ARE required to be covered to prevent contact.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Need further clarification on how to protect piping from elements and damage.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 23, NEGATIVE: 3, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
PAPE: This provision pertains to the mulch basin only, therefore it is appropriate to retain.

EXPLANATION OF NEGATIVE:
ALLEN: The rational from the committee doesn't make sense. 2" of cover does not protect pipe from elements or damage. The 2" requirement can, however, be a barrier for installations due to the variation in sites. For example, a pumped system with the tank/pump located in a basement would send supply piping outside the building, and perhaps around a patio or other obstacles before entering the landscape. These pipes should be allowed to be above grade (with proper material use for UV protection).
KRAUSE: I agree with Laura, some piping may need to be located above grade.
SHAPIRO: Less regulation better.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.11.1.2
Proposed Text:	**502.11.1.2 Filter.** ~~Not less than 140 mesh (115 micron) filter with a capacity of 25 gallons per minute (gpm) (1.58 L/s), or equivalent shall be installed.~~ Where a filter backwash is installed, the backwash and flush discharge shall discharge into the building sewer or private sewage disposal system. Filter backwash and flush water shall not be used for any purpose.
Problem Statement:	Rational: The specific type of filter installed will be contingent on the type of emitters and outlets used. It doesn't make sense to regulate the size or flow of the filter.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Lack of substantiation to strike existing language.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
ALLEN: Including filter specifications in this standard can limit innovation and design options. The type of filter required depends on the type of emitters used, and should be determined by the designer, installer, or manufacturer.
SHAPIRO: Less regulation.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.11.1.3
Proposed Text:	**502.11.1.3 Emitter Size.** Emitters shall be installed in accordance with the manufacturer's installation instructions. ~~Emitters shall have a flow path of not less than 1200 microns (μ) (1200 μm) and shall not have a coefficient of manufacturing variation (Cv) exceeding 7 percent. Irrigation system design shall be such that emitter flow variation shall not exceed 10 percent.~~
Problem Statement:	Rational: There many types of emitters and being so specific in this code could limit possibilities and potential future innovations. The intent behind this section would be to prevent too much greywater from being discharged in one location which could cause pooling or runoff. Pooling and runoff are already protected against in several other locations in the code.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	502.11.1.5
Proposed Text:	~~**502.11.1.5 Controls.** The system design shall provide user controls, such as valves, switches, timers, and other controllers, to rotate the distribution of gray water between irrigation zones.~~ Renumber remaining section
Problem Statement:	Rational: Not all systems have different irrigation zones. If a system is designed with multiple irrigation zones it will obviously have a way to rotate the distribution of graywater, otherwise the designer would not have installed multiple zones.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Section is needed to give direction if there are multiple zones.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	502.11.1.6
Proposed Text:	**502.11.1.6 Maximum Pressure.** Where pressure at the discharge side of the pump exceeds 20 pounds- force per square inch (psi) (138 kPa), a pressure- reducing valve able to maintain downstream pressure no greater than the maximum operating pressure of the installed tubing, emitters, or other components ~~not exceeding 20 psi (138 kPa)~~ shall be installed down-stream from the pump and before any emission device.
Problem Statement:	Rational: This codes should not be so specific and should allow for a range of graywater system components so long as they function as designed. My edit will ensure the pressure isn't greater than the tubing, emitters, or other components can handle, which is the intent of this section, without being unnecessarily prescriptive.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
MANN: This is not code language. Very poorly written. Needs to be re-written.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	502.11.2.1
Proposed Text:	~~**502.11.2.1 Single Family and Multi-Family Dwellings**. The gray water discharge to a mulch basin is limited to single family and multi-family dwellings.~~ (Renumber remaining sections)
Problem Statement:	Rational: Using a mulch basin is a method of filtering and distributing graywater subsurface. It is an affordable and simple method to increase absorption in the soil, decrease soil compaction, and provide surge capacity. If a designer/installers wants to use this method it should not matter what type of building the water is coming from. The amount of flow and types of plants that will be irrigated will determine if this method is preferable over others. Evergreen Lodge near Yosemite, CA is a great example of mulch basin irrigation being used in a commercial application. They have 40 cabins, a commercial laundry, and staff showers and laundry all on greywater with mulch basins.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: This requirement must remain for single and multi-family residences. Anything else will go before plan check and the AHJ. They will or will not be accepted on a case by case basis. The proponent offers no credible substantiation other than one's personal feelings.
RAWALPINDIWALA: Agree with Dave Mann.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	502.11.2.3
Proposed Text:	~~**502.11.2.3 Minimum Depth**. Gray water supply piping, including drip feeders, shall be a minimum 2 inches (51 mm) below finished grade and covered with mulch.~~ (renumber remaining sections)
Problem Statement:	Rational: Supply piping may come from a locations where the pipe runs under the building, or along a wall where it is impossible to locate them below grade. The supply piping doesn't release any graywater so there is no health reason for it to be buried. In contrast the outlets ARE required to be covered to prevent contact.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
The existing provision is necessary to protect pipes from temperature conditions and damage.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	503.5
Proposed Text:	**503.5 Initial Cross-Connection Test.** A cross-connection test is required in accordance with Section 501.11.2. Before the building is occupied or the system is activated, the installer shall perform the initial cross-connection test in the presence of the Authority Having Jurisdiction ~~and other authorities having jurisdiction~~. The test shall be ruled successful by the Authority Having Jurisdiction before final approval is granted.
Problem Statement:	• It is implied that throughout this standard, the Authority Having Jurisdiction may include subsequent authorities having jurisdiction depending on the application. • If 'and other authorities having jurisdiction' is desired to be left in the text, it should also be used throughout the rest of this standard for consistency. • If 'and other authorities having jurisdiction' is desired to be left in the text, it must be added to the last sentence for consistency: The test shall be ruled successful by the Authority Having Jurisdiction and other authorities having jurisdiction before final approval is granted.
Referenced Standards:	

Staff Note: Similar language is found in 501.11.2.1, 501.11.2.2, 602.5, 602.11.2.1, 602.11.2.2

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

WE-Stand 2017 – (Chapter 6, 601.1, 603.0 – 608.0, Tables 603.4.1, 606.2.1, 606.2.3) Item # 126

Name:	Josh Jacobs
Organization:	UL
Recommendation:	Revise text
Section Number:	601.1, 603.0-608.0, Tables 603.4.1, 606.2.1, 606.2.3
Proposed Text:	**CHAPTER 6** **~~NONPOTABLE~~ RAINWATER CATCHMENT SYSTEMS** **601.1 Scope.** The provisions of this chapter shall apply to the construction, alteration, and repair of ~~non-potable~~ rainwater catchment systems. **603.0 Potable Rainwater Catchment Systems.** **603.1 System Design.** Potable rainwater catchment systems complying with this appendix shall be designed by a person registered, licensed, or deemed competent by the Authority Having Jurisdiction to perform potable rainwater catchment system design work. **603.2 Permit.** It shall be unlawful for any person to construct, install, or alter, or cause to be constructed, installed, or altered any potable rainwater catchment systems in a building or on a premise without first obtaining a permit to do such work from the Authority Having Jurisdiction. **603.2.1 Plumbing Plan Submission.** No permit for any rainwater catchment system requiring a permit shall be issued until complete plumbing plans, with appropriate data satisfactory to the Authority Having Jurisdiction, have been submitted and approved. No changes or connections shall be made to either the rainfall catchment or the potable water system within any site containing a rainwater catchment water system without approval by the Authority Having Jurisdiction. **603.2.2 System Changes.** No changes or connections shall be made to either the rainwater catchment system or the potable water system within any site containing a rainwater catchment system requiring a permit without approval by the Authority Having Jurisdiction. **603.3 Product and Material Approval.** **603.3.1 Component Identification.** System components shall be properly identified as to the manufacturer. **603.3.2 Plumbing Materials and Systems.** Pipe, pipe fittings, traps, fixtures, material, and devices used in a potable rainwater system shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) and shall comply with the approved applicable recognized standards referenced in this standard and the plumbing code, and shall be free from defects. Unless otherwise provided for in this standard, all materials, fixtures, or devices used or entering into the construction of plumbing systems, or parts thereof, shall be submitted to the Authority Having Jurisdiction for approval. [UPC:301.2] **603.4 Maintenance and Inspection.** Potable rainwater catchment systems and components shall be inspected and maintained in accordance with Section 603.4.1 through Section 603.4.3. **603.4.1 Frequency.** Potable rainwater catchment systems and components shall be inspected and maintained in accordance with Table 603.4.1 unless more frequent inspection and maintenance is required by the manufacturer. **603.4.2 Maintenance Log.** A maintenance log for potable rainwater catchment systems shall be maintained by the property owner and be available for inspection. The property owner or designated appointee shall ensure that a record of testing, inspection and maintenance as required by Table 603.4.1 is maintained in the log. The log will indicate

	the frequency of inspection, and maintenance for each system. A record of the required water quality tests shall be retained for not less than 2 years. **603.4.3 Maintenance Responsibility.** The required maintenance and inspection of potable rainwater catchment systems shall be the responsibility of the property owner, unless otherwise required by the Authority Having Jurisdiction. **603.5 Operation and Maintenance Manual.** An operation and maintenance manual for potable rainwater catchment systems shall be supplied to the building owner by the system designer. The operating and maintenance manual shall include the following: (1) Detailed diagram of the entire system and the location of all system components. (2) Instructions on operating and maintaining the system. (3) Details on maintaining the required water quality as determined by the Authority Having Jurisdiction. (4) Details on deactivating the system for maintenance, repair, or other purposes. (5) Applicable testing, inspection and maintenance frequencies as required by Table 603.4.1. (6) A method of contacting the manufacturer(s). **603.6 Minimum Water Quality Requirements.** The minimum water quality for all potable rainwater catchment systems shall meet the applicable water quality requirements as determined by the Authority Having Jurisdiction. In the absence of water quality requirements, the guidelines EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies develop, revise, or expand alternate water source water quality standards. **603.7 Material Compatibility.** In addition to the requirements of this appendix, potable rainwater catchment systems shall be constructed of materials that are compatible with the type of pipe and fitting materials and water conditions in the system. **603.8 System Controls.** Controls for pumps, valves, and other devices that contain mercury that come in contact with the water supply are prohibited. **604.0 Connection.** **604.1 General.** No water piping supplied by a potable rainwater catchment system shall be connected to any other source of supply without the approval of the Authority Having Jurisdiction, Health Department or other department having jurisdiction. [UPC:602.4] **604.2 Connections to Public or Private Potable Water Systems.** Potable rainwater catchment systems shall have no direct connection to any public or private potable water supply or alternate water source system. Potable water from a public or private potable water system shall be permitted to be used as makeup water to the rainwater storage tank provided the public or private potable water supply connection is protected by an airgap or reduced-pressure principle backflow preventer in accordance with the plumbing code. **604.3 Backflow Prevention.** The potable rainwater catchment system shall be protected against backflow in accordance with the plumbing code. **605.0 Potable Rainfall Catchment System Materials.** **605.1 Collections Surfaces.** The collection surface for potable applications shall be constructed of a hard, impervious material and shall be approved for potable water use. Roof coatings, paints, and liners shall comply with NSF Protocol P151. **605.1.1 Prohibited.** Roof paints and coatings with lead, chromium, or zinc are prohibited. Wood roofing material and lead flashing are prohibited. **605.2 Rainwater Catchment System Drainage Materials.** Gutters and downspouts used in rainwater catchment drainage systems shall comply with NSF Protocol P151, and leaders and conductors shall be listed to NSF 61.

605.3 Storage Tanks. Rainwater storage shall be in accordance with Section 606.5.

605.4 Water Supply and Distribution Materials. Potable rainwater supply and distribution materials shall be in accordance with the requirements of the plumbing code for potable water supply and distribution systems.

606.0 Design and Installation.

606.1 Collection Surfaces. Rainwater shall be collected from roof or other cleanable aboveground surfaces specifically designed for rainwater catchment. Rainwater catchment system shall not collect rainwater from:

(1) Vehicular parking surfaces.

(2) Surface water runoff.

(3) Bodies of standing water.

606.1.1 Prohibited Discharges. Overflows, condensate, and bleed-off pipes from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater.

606.2 Minimum Water Quality. Upon initial system startup, the quality of the water for the intended applications shall be verified at the point(s) of use, as determined by the Authority Having Jurisdiction in accordance with Section 606.2.1 and Section 606.2.2. Water quality maintenance shall be according to Section 606.2.3.

606.2.1 Private Potable Water System. In the absence of water quality requirements determined by the Authority Having Jurisdiction, the minimum water quality for a private potable water system at the point of use shall comply with Table 606.2.1.

606.2.2 Public Use Occupancies. The minimum water quality for a potable water system for public use occupancies at the point of use and testing procedures shall comply with the Environmental Protection Agency (EPA) Safe Drinking Water Act for a public water system.

606.2.3 Maintenance. Normal system maintenance shall require system testing every 3 months in accordance with Table 606.2.3. Upon failure of the fecal coliform test, system shall be re-commissioned involving cleaning, and retesting in accordance with section 606.2.

606.3 Water Quality Devices and Equipment. Devices and equipment used to treat rainwater to maintain the minimum water quality requirements determined by the Authority Having Jurisdiction shall be listed or labeled (third-party certified) by a listing agency (accredited conformity assessment body) and approved for the intended application.

606.3.1 Filtration Devices. Potable water filters shall comply with NSF 53 and shall be installed in accordance with manufacturer's instructions.

606.3.2 Disinfection Devices. Chlorination, ozone, and ultraviolet or other disinfection methods shall be approved by an Authority Having Jurisdiction, or the product shall be listed according to a microbiological reduction performance standard for drinking water used to treat harvested rainwater to meet the required water quality permitted. The disinfection devices and systems shall be installed in accordance with the manufacturer's installation instructions and the conditions of listing. Disinfection devices and systems shall be located downstream of the water storage tank.

606.3.3 Filtration and Disinfection Systems. Filtration and disinfection systems shall be located after the water storage tank. Where a chlorination system is installed, it shall be installed upstream of filtration systems. Where ultraviolet disinfection system is installed, a filter not greater than 5 microns (5 µm) shall be installed upstream of the disinfection system.

606.4 Overhanging Tree Branches and Vegetation. Tree branches and vegetation shall not be located over the roof or other aboveground rainwater collection surface. Where existing tree branch and vegetation growth extends over the rainwater collection surface, it shall be removed as required in Section 603.4.

606.5 Rainwater Storage Tanks. Rainwater storage tanks shall be installed in accordance with Section 606.5.1 through Section 606.5.7.

606.5.1 Construction. Rainwater storage tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. Storage tanks or storage tank liners and coatings shall be listed to NSF 61 and approved by the Authority Having Jurisdiction for potable water applications, provided such tanks comply with approved applicable standards.

606.5.2 Location. Rainwater storage tanks shall be installed above or below grade.

606.5.2.1 Above Grade. Above grade storage tanks shall be of an opaque material, approved for aboveground use in direct sunlight, or shall be shielded from direct sunlight. Tanks shall be installed in an accessible location to allow for inspection and cleaning. The tank shall be installed on a foundation or platform that is constructed to accommodate all loads in accordance with the building code.

606.5.2.2 Below Grade. Rainwater storage tanks installed below grade shall be structurally designed to withstand all anticipated earth or other loads. Holding tank covers shall be capable of supporting an earth load of not less than 300 pounds per square foot (lb/ft^2) (1465 kg/m^2) when the tank is designed for underground installation. Below grade rainwater tanks installed underground shall be provided with manholes. The manhole opening shall be a minimum diameter of 20 inches (508 mm) and located not less than 4 inches (102 mm) above the surrounding grade. The surrounding grade shall be sloped away from the manhole. Underground tanks shall be ballasted, anchored, or otherwise secured, to prevent the tank from floating out of the ground when empty. The combined weight of the tank and hold down system should meet or exceed the buoyancy force of the tank.

606.5.3 Drainage and Overflow. Rainwater storage tanks shall be provided with a means of draining and cleaning. The overflow drain shall not be equipped with a shutoff valve. The overflow outlet shall discharge as required by the plumbing code for storm drainage systems. Where discharging to the storm drainage system, the overflow drain shall be protected from backflow of the storm drainage system by a backwater valve or other approved method.

606.5.3.1 Overflow Outlet Size. The overflow outlet shall be sized to accommodate the flow of the rainwater entering the tank and not less than the aggregate cross-sectional area of the inflow pipes.

606.5.4 Opening and Access Protection.

606.5.4.1 Animals and Insects. Rainwater tank openings to the atmosphere shall be protected to prevent the entrance of insects, birds, or rodents into the tank.

606.5.4.2 Human Access. Rainwater tank access openings exceeding 12 inches (305 mm) in diameter shall be secured to prevent tampering and unintended entry by either a lockable device or other approved method.

606.5.4.3 Exposure to Sunlight. Rainwater tank openings shall not be exposed to direct sunlight.

606.5.5 Inlets. A device or arrangement of fittings shall be installed at the inlet of the tank to prevent rainwater from disturbing sediment as it enters the tank.

606.5.6 Primary Tank Outlets. The primary tank outlet shall be located not less than 4 inches (102 mm) above the bottom of the tank, or shall be provided with floating inlet to draw water from the cistern just below the water surface.

606.5.7 Storage Tank Venting. Where venting by means of drainage or overflow piping is not provided or is considered insufficient, a vent shall be installed on each tank. The vent shall extend from the top of the tank and terminate a minimum of 6 inches (152 mm) above grade and shall be a minimum of 1 ½" (38 mm) in diameter. The vent terminal shall be directed downward and covered with a 3/32 inch (2.4 mm) mesh screen to prevent the entry of vermin and insects.

606.6 Pumps. Pumps serving rainwater catchment systems shall be listed for potable water use. Pumps supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than 15 pounds-force per square inch (psi) (103 kPa) residual pressure at the highest and most remote outlet served. Where the water pressure in the rainwater supply system within the building exceeds 80 psi (552 kPa), a pressure reducing valve reducing the pressure to 80 psi (552 kPa) or less to water outlets in the building shall be installed in accordance with the plumbing code.

606.7 Roof Drains. Primary and secondary roof drains, conductors, leaders, overflows, and gutters shall be designed and installed as required by the plumbing code.

606.8 Freeze Protection. Tanks and piping installed in locations subject to freezing shall be provided with an adequate means of freeze protection.

606.9 Roof Washer or Pre-Filtration System. Collected rainwater shall pass through a roof washer or pre-filtration system before the water enters the rainwater storage tank. Roof washer systems shall comply with Section 606.9.1 through Section 606.9.4.

606.9.1 Size. The roof washer shall be sized to direct a sufficient volume of rainwater containing debris that has accumulated on the collection surface away from the storage tank. The ARCSA/ASPE 63 Standard contains additional guidance on acceptable methods of sizing roof washers.

606.9.2 Debris Screen. The inlet to the roof washer shall be provided with a debris screen or other approved means that protects the roof washer from the intrusion of debris and vermin. Where the debris screen is installed, the debris screen shall be corrosion resistant and shall have openings no larger than ½ of an inch (12.7 mm).

606.9.3 Drain Discharge. Water drained from the roof washer or pre-filter shall be diverted away from the storage tank and discharged to a disposal area that does not cause property damage or erosion. Roof washer drainage shall not drain over a public way.

606.9.4 Automatic Drain. Roof washing systems shall be provided with an automatic means of self draining between rain events.

606.10 Roof Gutters. Gutters shall maintain a minimum slope and be sized in accordance with the plumbing code.

606.11 Drains, Conductors, and Leaders. The design and size of rainwater drains, conductors, and leaders shall be in accordance with the plumbing code.

606.12 Size of Potable Water Piping. Potable rainwater system distribution piping shall be sized in accordance with the plumbing code for sizing potable water piping.

607.0 Cleaning.

607.1 General. The interior surfaces of tanks and equipment shall be clean before they are put into service.

608.0 Supply System Inspection and Test. Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of the plumbing code for testing of potable water and storm drainage systems. Storage tanks shall be filled with water to the overflow opening for a period of 24 hours and during inspection or by other means as approved by the Authority Having Jurisdiction. All seams and joints shall be exposed during inspection and checked for water tightness.

Table 603.4.1
Minimum Potable Rainwater Catchment System
Testing, Inspection and Maintenance Frequency

Description	Minimum Frequency

Inspect and clean filters and screens, and replace (if necessary)	Every 3 months
Inspect and verify that disinfection, filters and water quality treatment devices and systems are operational. Perform any water quality tests as required by the Authority Having Jurisdiction.	In accordance with the manufacturer's instructions, and the Authority Having Jurisdiction.
Perform applicable water quality tests to verify compliance with Section 606.2.	Every 3-months
Perform a water quality test for E. Coli, Total Coliform, and Heterotrophic bacteria. For a system where 25 different people consume water from the system over a 60 day period, a water quality test for cryptosporidium shall also be performed.	After initial installation and every 12 months thereafter, or as directed by the Authority Having Jurisdiction.
Inspect and clear debris from rainwater gutters, downspouts, and roof washers.	Every 6 months
Inspect and clear debris from roof or other aboveground rainwater collection surface.	Every 6 months
Remove tree branches and vegetation overhanging roof or other aboveground rainwater collection surface.	As needed
Inspect pumps and verify operation.	After initial installation and every 12 months thereafter.
Inspect valves and verify operation.	After initial installation and every 12 months thereafter.
Inspect pressure tanks and verify operation.	After initial installation and every 12 months thereafter.
Clear debris and inspect storage tanks, locking devices, and verify operation.	After initial installation and every 12 months thereafter.
Inspect caution labels and marking.	After initial installation and every 12 months thereafter.

TABLE 606.2.1
MINIMUM WATER QUALITY

Escherichia coli (fecal coliform):	Non-detectable
Protozoan Cysts:	Non-detectable
Viruses:	Non-detectable
Turbidity:	<0.3 NTU

TABLE 606.2.3
MINIMUM SYSTEM MAINTENANCE REQUIREMENTS

Escherichia coli (fecal coliform):	Non-detectable
Turbidity:	<0.3 NTU

(Delete Appendix A in its entirety)

Problem Statement:	Insert text currently in Appendix A from A101.2 – A106.0. With the issues of severe drought in many areas of not only North America, but the globe, why would we restrict this standards requirements for rainwater catchment systems to only nonpotable ones in the required part of the standard? A good point to start the discussion is currently listed in Appendix A, why not move it into the body of the standard and start the discussion around potable rainwater catchment - its positive impacts and potential issues.
Referenced Standards:	NSF 53; EPA/625/R-04/108; NSF Protocol P151, NSF 61

Note: NSF 53 and NSF 61 meet the requirements for mandatory referenced standards in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

Note: EPA/625/R-01/108 and NSF Protocol P151 was not developed via an open process having a published development procedure in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Reject

TC SUBSTANTIATION:
Language should be left in Appendix as supplementary provisions for formal adoption where needed.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	601.2
Proposed Text:	**601.2 System Design.** Rainwater catchment systems shall be designed in accordance with this chapter by a person registered, ~~or~~ licensed, or deemed competent ~~to perform plumbing design work or who demonstrates competency~~ to design rainwater catchment systems as required by the Authority Having Jurisdiction. Components, piping, and fittings used in any rainwater catchment systems shall be listed. **Exceptions:** (1) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems used for irrigation with a maximum storage capacity of 5 000 ~~360~~ gallons (~~1363~~ 18 927 L) where the tank is supported directly upon grade and the ratio of height to width (or diameter) does not exceed 2 to 1. (2) A person registered or licensed to perform plumbing design work is not required to design rainwater catchment systems for single family dwellings where all outlets, piping, and system components are located on the exterior of the building.
Problem Statement:	Rational: The specific skills needed to install most non-potable rainwater catchment systems for irrigation are predominately landscape irrigation (the irrigation system) or roofing (if gutters are altered) type of work, not plumbing work. Landscape contractors install a lot more rainwater catchment systems than do plumbing contractors. This requirement in 601.2 should be general to allow for the local experts from whatever field to be able to install the systems. The language I'm suggesting is consistent with the potable rainwater catchment system appendix from this code. Rational: 360 gallons is very small, this water would be used up in a less than week to irrigate a 1,000 square foot lawn during the summer. There is no real difference in the complexity or design of a 360 gallon system versus a 5,000 gallons system, so long as the tank is stable on a stable foundation. By using the 5,000 gallons number this code would be consistent with most existing codes for water storage- no permit is needed so long as the tank is under 5,000 gallons. This would also be consistent with California's rainwater code. Chapter 17 of the CA Plumbing Code provided for reference.
Referenced Standards:	

TC ACTION:
Accept as amended:

601.2 System Design. Rainwater catchment systems shall be designed in accordance with this chapter by a ~~person registered, licensed, or deemed competent~~ registered design professional or a person who demonstrates competency to design rainwater catchment systems as required by the Authority Having Jurisdiction. Components, piping, and fittings used in any rainwater catchment systems shall be listed.

Exceptions:
(1) A ~~person registered or licensed to perform plumbing design work is not required to design~~ rainwater catchment system~~s~~ used for irrigation with a maximum storage capacity of 5 000 gallons (18 927 L) where the tank is supported directly upon grade and the ratio of height to width (or diameter) does not exceed 2 to 1.

(2) A ~~person registered or licensed to perform plumbing design work is not required to design~~ rainwater catchment system~~s~~ for single family dwellings where all outlets, piping, and system components are located on the exterior of the building.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 18, NEGATIVE: 6, ABSTENTION: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MAJEROWICZ: Existing language is adequate.
MANN: A plumbing contractor is more than qualified to design these system. That contractor should not be excluded for landscape contractor that knows nothing about a plumbing system.
PAPE: A licensed plumbing designer should not be the only qualified, but the licencee should not have to prove competency to the AHJ.
RAWALPINDIWALA: Prefer original language.
SALTZBERG: The phrase "deemed competent" is a very subjective way of determining competency.
TINDALL: The word deemed competent is subjective, the applicant may understand the graywater system but not the entire pluming system.

COMMENT ON ABSTENTION:
HOFFMAN: The phrase "deemed competent" is a very subjective way of determining competency. We need to revisit this one.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	601.3
Proposed Text:	**601.3 Permit.** It shall be unlawful for any person to construct, install, alter, or cause to be constructed, installed, or altered any rainwater catchment system in a building or on a premises without first obtaining a permit to do such work from the Authority Having Jurisdiction. Exceptions: (1) A permit is not required for exterior rainwater catchment systems used for outdoor drip and subsurface irrigation with a maximum storage capacity of 5 000 ~~360~~ gallons (~~1363~~ 18 927 L) where the tank is supported directly upon grade and the ratio of height to width (or diameter) does not exceed 2 to 1 and it does not require electrical power or a make-up water supply connection. (2) A plumbing permit is not required for rainwater catchment systems for single family dwellings where all outlets, piping, and system components are located on the exterior of the building. This does not exempt the need for permits if required for electrical connections, tank supports, or enclosures.
Problem Statement:	Rational: Exempting permits from systems with the tanks smaller than 5,000 gallons would be consistent with most codes for water storage tanks as well as California's rainwater code. If the tank is stable, upon grade, and doesn't require power or make-up water it is a very safe and low-risk system and thus should not require permits. Chapter 17 of the CPC supplied for reference.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MAJEROWICZ: 5000 gallons is too high without a permit.
MANN: The exception for no permit was intended for small systems, hence the 360 gallons. Increasing the size to 5,000 gallons was not the original intent. This exception should not be increased to 5,000 gallons. This is not protecting the health and safety of the public.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	601.5.2
Proposed Text:	~~**601.5.2 Maintenance Log.** A maintenance log for rainwater catchment systems is required to have a permit in accordance with Section 601.3 and shall be maintained by the property owner and be available for inspection. The property owner or designated appointee shall ensure that a record of testing, inspection and maintenance as require by Table 601.5 is maintained in the log. The log will indicate the frequency of inspection and maintenance for each system.~~ (renumber remaining sections)
Problem Statement:	Rational: This is an onerous requirement. There is no evidence a maintenance log is needed and this would only encourage unpermitted systems. There are no similar requirements for other home systems, that could have many more potential health risks, for example drinking water wells, septic systems, swimming pools, or hot tubs.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 14, NEGATIVE: 11, ABSTENTION: 1, NOT RETURNED: 2 Gray, Tabakh

NOTE: Item #129 failed to achieve the necessary 2/3 affirmative vote of returned ballots. In accordance with Section 6.8.2 of the Regulations Governing Consensus Development of WE•Stand, a public comment is requested for this proposal. The technical committee will reconsider this proposal as a public comment.

EXPLANATION OF NEGATIVE:
HOFFMAN: Documentation is the only thing we have after instillation. We need to reject to keep original intent.
KOELLER: Concur with the comments of Kent Sovocool, Bill Hoffman, Matt Sigler, and Thomas Pape.
KRAUSE: Maintenance logs are important to demonstrate system is being operated and cared for so they will function properly.
MAJEROWICZ: Same as Tom Pape.
MANN: No technical data submitted to support the problem statement. Section 601.3 states that no permit is required for certain residential applications. So to state that this would encourage unpermitted systems is illogical.
MECHAM: I agree with other comments against acceptance.
PAPE: In the event of a health problem, maintenance logs are important to prove or disprove proper maintenance has occurred. It is also valuable to the new owner when the property is sold. If maintenance is performed, it seems recording the event would be only a very minor inconvenience to the user.
RAWALPINDIWALA: Agree with other comments.

SIGLER: The proponent has failed to provide any technical data to demonstrate that the proposed language will not jeopardize public health and safety.
SOVOCOOL: Documentation of maintenance is the only reasonable way for an AHJ to check it has occurred in situations where an AHJ is required to do so.
TINDALL: Same as all the above.

COMMENT ON ABSTENTION:
DIGIOVANNI: Abstain

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	601.7
Proposed Text:	**601.7 Minimum Water Quality Requirements.** The minimum water quality for rainwater catchment systems shall meet the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction. Water quality for non-potable rainwater catchment systems shall comply with Section 605.9.4. **Exceptions:** (1) Water treatment is not required for rainwater catchment systems used for spray ~~aboveground~~ irrigation with a maximum storage capacity of 360 gallons (1363 L). (2) Water treatment is not required for rainwater catchment systems used for non-spray ~~subsurface or drip~~ irrigation.
Problem Statement:	Rational: This should specify spray irrigation to avoid confusion from regulators that may interpret drip irrigation as requiring treatment, even though it says below that drip does not require treatment- it is a form of above ground irrigation.
Referenced Standards:	

TC ACTION:
Accept as amended:

601.7 Minimum Water Quality Requirements. The minimum water quality for rainwater catchment systems shall meet the applicable water quality requirements for the intended application as determined by the Authority Having Jurisdiction. Water quality for non-potable rainwater catchment systems shall comply with Section 605.9.4.
Exceptions:
(1) Water treatment is not required for rainwater catchment systems used for ~~spray~~ aboveground irrigation with a maximum storage capacity of 360 gallons (1363 L).
(2) Water treatment is not required for rainwater catchment systems used for non-spray irrigation.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, ABSTENTION: 1, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON ABSTENTION:
HOFFMAN: We go back to the 360 gallons here and not 5000. Did I miss something?

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	602.4
Proposed Text:	**602.4 Connections to Potable or Reclaimed (Recycled) Water Systems.** Rainwater catchment systems shall have no unprotected direct connection to any potable water supply or alternate water source system. Potable or reclaimed (recycled) water shall be permitted to be used as makeup water for a rainwater catchment system provided the potable or reclaimed (recycled) water supply connection is protected by an airgap or reduced-pressure principle backflow preventer in accordance with the plumbing code.
Problem Statement:	Rational: In other sections of this code reduced pressure principal devices are allows. It should be clarified throughout the code that unprotected direct connections are not allowed.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: One does not want to connect rainwater to the potable water system. The potable should be attached to the rainwater system as a make-up. There is a reason for this language. It protects the health and safety of the public.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	602.9.2
Proposed Text:	**602.9.2 Deactivation and Drainage for Cross-connection Test.** Where any portion of a rainwater catchment system is installed within a building, ~~T~~the rainwater catchment system and the potable water system within the building shall be provided with the required appurtenances (e.g., valves, air or vacuum relief valves, etc.) to allow for deactivation or drainage as required for cross-connection test in Section 601.11.2.
Problem Statement:	Rational: Including this qualifier makes it more clear when a cross-connection test is required. Without it the section could be interpreted as all systems require testing.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: This adds nothing to this Section of the code. It is very clear and the proposed language adds nothing.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	602.9.3.3
Proposed Text:	**602.9.3.3 Prohibited Discharges.** Overflows and bleed-off pipes from roof-mounted equipment and appliances shall not discharge onto roof surfaces that are intended to collect rainwater without prior approval from the Authority Having Jurisdiction.
Problem Statement:	Rational: In other sections of this same standard some of this water is allowed to be reused, under specified conditions (Section 411.4 Evaporative Cooler Water Use and 412.0 Condensate Recovery) so it seems like there may be instances where using this water could be combined with a rainwater system.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	602.9.4
Proposed Text:	**602.9.4 Minimum Water Quality.** The minimum water quality for harvested rainwater shall meet the applicable water quality requirements for the intended applications as determined by the Authority Having Jurisdiction. In the absence of water quality requirements determined by the Authority Having Jurisdiction, the minimum treatment and water quality shall also comply with Table 602.9.4. **Exception:** No treatment is required for rainwater used for non-spray ~~subsurface or non-sprinkled surface i~~rrigation where the maximum storage volume is less than 5 000 ~~360~~ gallons (~~1363~~ 18 727 L).
Problem Statement:	Rational: 360 gallons is very small, this water would be used up in a less than week to irrigate a 1,000 square foot lawn during the summer. Requiring treatment for a system over 360 gallons is onerous and unnecessary. 5,000 gallons would be used in 10 weeks on a 1,000 square foot lawn.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: There is/was no justification submitted to change from 360 gallons to 5,000 gallons. The rational is simply the proponent's feelings. What if one only needs to water once a week compared to two or three times a week. What if one lives in the Mid-west? What if one lives in any jurisdiction other than California?

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	602.9.4.1
Proposed Text:	~~**602.9.4.1 Maintenance.** Non-potable water shall be tested every 12 months and a record of the test results shall be maintained by the system owner for a period of two (2) years.~~ (renumber remaining sections)
Problem Statement:	This is an unreasonable requirement, increasing the cost of maintaining the system, and inconsistent with regulations of any similar system (drinking water wells, septic systems, etc.). Additionally, a once a year test will not provide much information since the water quality in the tank will change day to day and week to week.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
MANN: Contrary to the problem statement this is not inconsistent with some jurisdiction's requirements regarding drinking water wells.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	602.11.1
Proposed Text:	**602.11.1 Supply System Inspection and Test.** Rainwater catchment systems shall be inspected and tested in accordance with the applicable provisions of the plumbing code for testing of potable water and storm drainage systems. When required by the Authority Having Jurisdiction, indoor storage tanks shall be filled with water to the overflow opening. ~~Storage tanks shall be filled with water to the overflow opening for a period of 24 hours and during inspection or by other means as approved by the Authority Having Jurisdiction.~~ All seams and joints shall be exposed during inspection and checked for water tightness.
Problem Statement:	Rational: It is unreasonable to require tanks to be filled. These systems are designed to conserve water and are often installed in drought-stricken regions, with water rationing in effect. Filling a 10,000 gallons tank could be damaging to the local water supply. Since the overflow will only be overflowing during times of rain, when everything is wet, this requirement is silly for all outdoor tank installations. A visual inspection of the overflow should be able to determine if it was installed properly, and the only risk would be a small leak, which would only occur doing active rain when everything is wet anyway.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Insufficient evidence that this proposal would improve the standard.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	602.11.2
Proposed Text:	**602.11.2 Annual Cross-Connection Inspection and Testing.** Where there is the potential for cross-connection, ~~A~~an initial ~~and subsequent annual~~ inspection and test shall be performed on both the potable and rainwater catchment system. Subsequent cross-connection testing shall be conducted in accordance with local regulations. The potable and rainwater catchment system shall be isolated from each other and independently inspected and tested to ensure there is no cross-connection in accordance with Section 602.11.2.1 through Section 602.11.2.4.
Problem Statement:	Not all systems have potential for cross-connection so this should be clarified. Frequency of future cross-connection testing should be left up to the authority having jurisdiction.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Does not provide adequate cross-connection control.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
KRAUSE: Agree with problem statement. Annual inspections for systems that have no potential for cross connection should be excluded.
SHAPIRO: Less oversight and regulation where appropriate.

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	602.11.2.1
Proposed Text:	**602.11.2.1 Visual System Inspection.** Prior to commencing the cross-connection testing, a dual system inspection shall be conducted by the Authority Having Jurisdiction ~~and other authorities having jurisdiction~~ as follows: (1) Meter locations of the rainwater and potable water lines shall be checked to verify that no modifications were made~~,~~ and that no cross-connections are visible. (2) Pumps and equipment, equipment room signs, and exposed piping in equipment room shall be checked. (3) Valves shall be checked to ensure that valve lock seals are still in place and intact. Valve control door signs shall be checked to verify that no signs have been removed.
Problem Statement:	• It is implied that throughout this standard, the Authority Having Jurisdiction may include subsequent authorities having jurisdiction depending on the application. • If 'and other authorities having jurisdiction' is desired to be left in the text, it should also be used throughout the rest of this standard for consistency. • Punctuation correction. No comma needed.
Referenced Standards:	

Staff Note: Similar language is found in: 501.11.2.1, 503.5, 504.5, 602.5, 602.11.2.2

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	602.11.2.2
Proposed Text:	**602.11.2.2 Cross-Connection Test.** The procedure for determining cross-connection shall be followed by the applicant in the presence of the Authority Having Jurisdiction ~~and other authorities having jurisdiction~~ to determine whether a cross-connection has occurred as follows: (1) The potable water system shall be activated and pressurized. The rainwater catchment system shall be shut down, depressurized, and drained. (2) The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction while the rainwater catchment system is empty.
Problem Statement:	• It is implied that throughout this standard, the Authority Having Jurisdiction may include subsequent authorities having jurisdiction depending on the application. • If 'and other authorities having jurisdiction' is desired to be left in the text, it should also be used throughout the rest of this standard for consistency. • If 'and other authorities having jurisdiction' is desired to be left in the text, it must be added to (2) for consistency: The potable water system shall remain pressurized for a minimum period of time specified by the Authority Having Jurisdiction or other authorities having jurisdiction while the rainwater catchment system is empty.
Referenced Standards:	

Staff Note: Similar language is found in: 501.11.2.1, 503.5, 504.5, 602.5, 602.11.2.1

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	602.11.2.4
Proposed Text:	~~**602.11.2.4 Annual Inspection.** An annual inspection of the rainwater catchment system, following the procedures listed in Section 602.11.2.1 shall be required. Annual cross-connection testing, following the procedures listed in Section 602.11.2.2 shall be required by the Authority Having Jurisdiction, unless site conditions do not require it. In no event shall the test occur less than once in 4 years. Alternate testing requirements shall be approved by the Authority Having Jurisdiction.~~
Problem Statement:	Requiring all rainwater systems to be inspected annually is an onerous requirement and inconsistent with other similar systems (drinking water wells, septic systems, swimming pools, hot tubs, etc.). This requirement would deter legal installations. Local jurisdictions will require cross-connection testing if needed based on other regulations, as well as section 602.11.2 of this same standard.
Referenced Standards:	

Staff Note: Similar language found in Section 501.11.2.4.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 15, NEGATIVE: 9, ABSTENTION: 2, NOT RETURNED: 2 Gray, Tabakh

NOTE: Item #141 failed to achieve the necessary 2/3 affirmative vote of returned ballots. In accordance with Section 6.8.2 of the Regulations Governing Consensus Development of WE•Stand, a public comment is requested for this proposal. The technical committee will reconsider this proposal as a public comment.

EXPLANATION OF NEGATIVE:
KOELLER: Concur with the comments of Thomas Pape, Kent Sovocool, Bill Hoffman, and Matt Sigler.
MAJEROWICZ: To protect public safety and health systems must be inspected annually.
MANN: I have read and agree with the comments of Tom Pape, Matt Sigler and Kent Sovocool. If stricken this would be in conflict with the UPC.
MECHAM: Current language has flexibility included as it might be enforced to meet specific site requirements.
PAPE: While I agree that small system might not require annual testing, there should be some level of oversight for some systems, probably based on size and end-use of the water. I prefer the proponent provide a revised inspection plan, rather than the total elimination of the inspections.
RAWALPINDIWALA: Agree with other comments.
SIGLER: The proponent has failed to provide any technical data to demonstrate that the proposed language will not jeopardize public health and safety.

SOVOCOOL: While annual inspection may indeed be onerous, total elimination of all testing is too sweeping to protect the health of the occupants.
TINDALL: To protect the health and safety they need to be tested annually.

COMMENT ON ABSTENTION:
DIGIOVANNI: Abstain
HOFFMAN: We need to revisit this one to set logical criteria for when to inspect.

Name:	Tim Keane
Organization:	Legionella Risk Management, Inc.
Recommendation:	Revise text
Section Number:	702.6
Proposed Text:	**702.6 Hard Water.** Where water has hardness equal to or exceeding 9 grains per gallon (gr/gal) (154 mg/L) measured as total calcium carbonate equivalents, the water supply line to water heating equipment in new one- and two family dwellings shall be roughed-in to allow for the installation of water treatment equipment. Water softener shall be capable of delivering an adjustable amount of unsoftened water from 0% to 20% of total softened water blended in with the soft water outlet stream
Problem Statement:	100% softened water is very corrosive to all metals including lead and copper by eliminating calcium and magnesium which are natural corrosion inhibitors and replacing them with sodium. Allowing a certain amount of hardness to bypass the softener reduces corrosion rates and makes showering more comfortable. The amount of softener regenerations and subsequent salt usage is directly proportional to the volume of water softened. If for every gallon of water used only 80% is softened then backwashing water volume and salt consumption is reduced by 20%.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATON:
Proposal does not give substantiation on improving water efficiency.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
YEGGY: Water which has been softened by a cation exchange water softener is not corrosive. This issue has been studied in depth by numerous investigators, including Thomas J. Sorg and Michael R. Schock of the U.S. EPA's Drinking Water Research Division as project manager and principal investigator, respectively. Not only did they conclude that “The addition of calcium is not considered a corrosion control treatment strategy…”, their study also proved that removal of hardness with an ion exchange water softener does not affect the factors which cause or even accelerate corrosion. This is a common myth caused by confusion between naturally soft water, which is low in TDS and corrosive, versus artificially softened water which is not low in TDS, nor is it corrosive. For further reference by the group, I have uploaded the EPA study, along with a white paper by the European Water Treatment Association (EWTA) on the same topic, to the WE Stand TC portal. There are many applications, especially on the commercial/industrial side, where it is critical to have softened water with <1 grain of hardness per gallon. Requiring the installation of blending softeners for those facilities would not be practical or beneficial.

Name:	Gary Morgan
Organization:	Viega LLC
Recommendation:	Revise text
Section Number:	702.7.1
Proposed Text:	**702.7.1 Maximum Length / Volume of Hot Water in a Branch.** The maximum length of a branch between and source of hot water and the fixture fitting shall not exceed 15 feet or the volume shall not exceed 24 oz. Water heaters, recirculation loops and electrically heat traced pipe shall be considered sources of hot water. Where a fixture fitting shut off valve (supply stop) is installed ahead of the fixture fitting, the maximum length is measured between the source of hot water and the fixture fitting shut off valve (supply stop). **Exceptions**: 1. Where a design layout of a parallel or induced re-circulation loop is used, the maximum length of a branch that is designed to induce flow parallel to a main recirculation system when there is no fixture demanding hot water shall not be subject to the length and internal volume limits. 2. Where a design layout of a series branch is used, branches that incorporate two or more flow-through style fittings as the final connection to a fixture fitting shut off valve shall not exceed 25 foot (7670 m) or the volume shall not exceed 40 ounces (1183 ml). 3. Where a design layout of a series ring is used, branches that incorporate flow-through style fittings as the final connection to a fixture fittings shut off valve and that are piped to provide multiple paths from a recirculation system, but do not experience continuous flow without fixture demand shall not exceed 50 feet (15 240 mm) or the volume shall not exceed 80 ounces (2366 ml). (Renumber existing exceptions 1. and 2. to 4. and 5. respectively)
Problem Statement:	Flow-through style fittings should be considered and even promoted in this code for use in hot and cold water distribution systems to effectively and economically reduce or eliminate dead leg pipe runs to fixtures which can otherwise promote the growth of legionella type bacteria and create water waste while purging tepid water from the dead branch. A fixture shut off valve is attached directly to the flow-through style fitting serving the end-use device. 1. Flow-through fittings can be utilized along with a venturi, valve, or other pressure manipulating device to create secondary recirculation loops that operate in parallel to a primary recirculation loop. These secondary loops, because they have constantly flowing hot water, are also considered a source of hot water. (this principle has been used for years with heating and cooling water) 2. Flow-through fittings can be used to plumb fixtures in series branch (daisy chaining) and use of a fixture draws fresh hot water through other fixture's fittings. Plumbing fixtures in series leads to a more efficient overall system, but may require physically longer branches by a factor of the spacing between the fixtures. 3. Flow-through fittings can be used to plumb fixtures into a series ring (with 2 flow paths to the same hot water source). Water flows along the path of least resistance and any fixture used will bring fresh hot water to each other fixture in the loop. These designs are inherently safer and more efficient and should not be subject to the same limitations as a dead-leg branches. See separate pictorial document illustrating these three different design layouts utilizing flow-through fittings. Illustrations provided as reference.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Further substantiation is needed to support the proposal. Appears to specify a design method that is not appropriate for the standard. Volume and length should be revisited due to pathogen control issues.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
SIGLER: This proposal and Item #10 outline a truly efficient method for delivering hot water. I would encourage the proponent to submit additional technical data, during the public comment stage, to further substantiate these proposals.

Name:	Tim Keane
Organization:	Legionella Risk Management, Inc.
Recommendation:	Revise text
Section Number:	703.4.5.2
Proposed Text:	**703.4.5.2 Outlet Temperature Controls.** Temperature controlling means shall be provided to limit the maximum temperature of water delivered from lavatory faucets in high use public facility restrooms to 110°F (43°C). ~~[ASHRAE 90.1:7.4.4.3]~~
Problem Statement:	The growing rate of opportunistic pathogen outbreaks in plumbing systems is simple math. When average pipe diameters (a) are constant and the total amount of pipe lengths in a building (b) are constant in most buildings and increasing dramatically in health care facilities due to many more sinks and showers (4b) and the water use (z) is cut drastically by low flow restrictors then the math is clear the age of water stored in the building (c) is multiplied in proportion to the reduction in flow restriction 4X and increase in fixture count 4X in healthcare. This 4X to 16X or greater increase in water aging in a building water system directly impacts disinfectant residuals. This dramatic reduction in flow rates at fixtures directly impact water velocity in piping, and according this dramatic increase in water aging and decrease in water velocity results in dramatic increase in Legionella growth rate potential. Equally important is temperature. 110F is the best temperature for culturing Legionella. Every 10F temperature rise above 110F reduces in half the potential for Legionella growth. The initial public lavatory codes were good ones recommending lower temperature and flow in areas of high use. The original ASHRAE 90.1 version 1989 states, Public lavatory faucets are those intended for the unrestricted use of more than one individual in assembly occupancies, business occupancies, public buildings, transportations facilities etc." This was based on EPA NAECA code. This lower temperature and lower flow in public facility restrooms that are not used many times a day pose a high risk EPA NAECE provided for reference.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Matter deserves a coordinated, comprehensive review in coordination with other agencies to come up with a permanent solution.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Tim Keane
Organization:	Legionella Risk Management, Inc.
Recommendation:	Revise text
Section Number:	703.4.5.2
Proposed Text:	**703.4.5.2 Outlet Temperature Controls.** Temperature controlling means shall be provided to limit the maximum temperature of water delivered from lavatory faucets in public facility restrooms to ~~110°F (43°C)~~ 115°F (46°C). ~~[ASHRAE 90.1:7.4.4.3]~~
Problem Statement:	The growing rate of opportunistic pathogen outbreaks in plumbing systems is simple math. When average pipe diameters (a) are constant and the total amount of pipe lengths in a building (b) are constant in most buildings and increasing dramatically in health care facilities due to many more sinks and showers (4b) and the water use (z) is cut drastically by low flow restrictors then the math is clear the age of water stored in the building (c) is multiplied in proportion to the reduction in flow restriction 4X and increase in fixture count 4X in healthcare. This 4X to 16X or greater increase in water aging in a building water system directly impacts disinfectant residuals. This dramatic reduction in flow rates at fixtures directly impact water velocity in piping, and according this dramatic increase in water aging and decrease in water velocity results in dramatic increase in Legionella growth rate potential. Equally important is temperature. 110F is the best temperature for culturing Legionella. Every 10F temperature rise above 110F reduces in half the potential for Legionella growth. Raising the temperature limit just 5 degrees to 115F would be a significant reduction in risk and could provide significant water and energy savings. Many hospitals to meet risk management requirements will flush to drain these low flow low temperature faucets as much as 20 minutes or longer per day to reduce the risk of Legionnaires' disease.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Matter deserves a coordinated, comprehensive review in coordination with other agencies to come up with a permanent solution.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Tim Keane
Organization:	Legionella Risk Management, Inc.
Recommendation:	Revise text
Section Number:	704.1
Proposed Text:	**704.1 Softening and Treatment.** Where water has hardness equal to or exceeding 10 gr/gal (171 mg/L) measured as total calcium carbonate equivalents, the water supply line to water heating equipment and the circuit of boilers shall be softened or treated to prevent accumulation of lime scale and consequent reduction in energy efficiency. Water softener shall be capable of delivering an adjustable amount of unsoftened water from 0% to 25% of total softened water blended in with the soft water outlet stream
Problem Statement:	100% soft water is corrosive to equipment. Allowing a certain amount of hardness in the water reduces corrosion rates and makes showering more comfortable. An additional benefit is if 25% of the makeup water is not softened then backwash rates are reduced by 25% and salt consumption is reduced by 25%.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Proposal does not give substantiation on improving water efficiency.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

WE-Stand 2017 – (Table 901.1) Item # 148

Name:	Angel Guzman, Colleen O'Brien
Organization:	The American Society of Mechanical Engineering (ASME)
Recommendation:	Revise text
Section Number:	Table 901.1
Proposed Text:	**Table 901.1 Referenced Standards** **STANDARD NUMBER-YEAR** | **STANDARD TITLE** | **REFERENCED SECTION** ASME A112.19.3/CSA B45.4-2008 (R2013) | Stainless Steel Plumbing Fixtures | 402.3.1 ASME A112.19.19-2006 (R2011)* | Vitreous China Nonwater Urinals | 402.3.1 (portions of table not shown remain unchanged)
Problem Statement:	The above revisions reflect the latest updates to the ASME standards that are referenced in Table 901.1.
Referenced Standards:	

Note: ASME A112.19.3/CSA B45.4-2008 (R2013) and ASME A112.19.19-2006 (R2011) meet the requirements for a mandatory reference standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NOT RETURNED: 3 Gray, Sovocool, Tabakh

COMMENT ON AFFIRMATIVE:
MANN: I will vote affirmative but, it may be editorial, the reference to 2008 and 2006 must be stricken.

<table>
<tr><td>Name:</td><td>Kim Wagoner</td></tr>
<tr><td>Organization:</td><td>U.S. Environmental Protection Agency,
Office of Wastewater Management (4204) (EPA)</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Recommendation:</td><td>Revise text</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Section Number:</td><td>Table 901.1</td></tr>
<tr><td>Proposed Text:</td><td>
<table>
<tr><th colspan="3">Table 901.1
Referenced Standards</th></tr>
<tr><th>STANDARD NUMBER-YEAR</th><th>STANDARD TITLE</th><th>REFERENCED SECTION</th></tr>
<tr><td>~~EPA/625/R-04/108-2004~~ EPA/600/R-12/618-2012</td><td>Guidelines for Water Reuse</td><td>501.7, A 101.7</td></tr>
</table>
(portions of table not shown remain unchanged)
</td></tr>
<tr><td>Problem Statement:</td><td>The above revision reflects the latest update to the EPA standard that is referenced in Table 901.1.</td></tr>
<tr><td>Referenced Standards:</td><td></td></tr>
</table>

Note: The EPA/600/R-12/618 does not meet the requirements for a mandatory reference standard in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

WE-Stand 2017 – (Table 901.1) Item # 150

Name:	Jeremy Brown
Organization:	NSF International (NSF)
Recommendation:	Revise text
Section Number:	Table 901.1
Proposed Text:	**Table 901.1 Referenced Standards** **STANDARD NUMBER-YEAR** / **STANDARD TITLE** / **REFERENCED SECTION** NSF 58-~~2013~~* 2014 / Reverse Osmosis Drinking Water Treatment Systems / 406.3 NSF 61-~~2012~~* 2014a / Drinking Water Systems Components – Health Effects / A 104.5.1 (portions of table not shown remain unchanged)
Problem Statement:	The above revisions reflect the latest updates to the NSF standards that are referenced in Table 901.1
Referenced Standards:	

Note: NSF 58-2014 and NSF 61-2014a meet the requirements for a mandatory reference standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	IAPMO Staff
Organization:	
Recommendation:	Add text
Section Number:	Table 901.1
Proposed Text:	**Table 901.1 Referenced Standards** **STANDARD NUMBER-YEAR** | **STANDARD TITLE** | **REFERENCED SECTION** ASHRAE 90.2-2007 | Energy Efficient Design of Low-Rise Residential Buildings | 702.2, 702.4 (portions of table not shown remain unchanged)
Problem Statement:	To add the ASHRAE Standard to Table 901.1
Referenced Standards:	

Note: ASHRAE 90.2-2007 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	Table A 101.5.1

Proposed Text:

Table A 101.5.1
Minimum Potable Rainwater Catchment System
Testing, Inspection and Maintenance Frequency

Description	Minimum Frequency
~~Perform applicable water quality tests to verify compliance with Section A 104.2~~.	~~Every 3-months~~
~~Perform a water quality test for E. Coli, Total Coliform, and Heterotrophic bacteria. For a system where 25 different people consume water from the system over a 60 day period, a water quality test for cryptosporidium shall also be performed.~~	~~After initial installation and every 12 months thereafter, or as directed by the Authority Having Jurisdiction.~~

(portions of table not shown remain unchanged)

Problem Statement:

Rational: proposal is to remove lines 3 and 4 from the table- the rest of the table to remain unchanged, This table already contains a requirement to inspect and verify that disinfection, filter and water quality treatment devices and systems are operational, and to perform any water quality tests as required by the AHJ. Since testing is expensive and doesn't ensure the system is functioning well since the quality of the incoming water can change day to day, requiring this testing adds an unfair burden on rainwater system owners and doesn't make the systems safer. Drinking water well owners do not have similar requirements. In addition, there may be differences in the local requirements for public vs. private water systems so this code should not attempt to differentiate and regulate the supplies differently. The AHJ will apply local regulations for rainwater systems providing water for more people/homes. Lastly, some of the testing required is illogical- heterotrophic bacteria are harmless but could indicate the potential for other bacteria to grow, such as E.Coli. As stated by the National Primary Drinking Water Regulations established by the U.S. EPA a "lower concentration of heterotrophic bacteria in the drinking water is linked to a better maintenance of the treatment and distribution systems." According to these regulations, treatment techniques should aim to control HPC concentrations in surface waters and groundwaters influenced by surface waters to less than 500 CFU/mL (using standard methods). Note: "This is not a health-based standard, but reflects the concern that at concentrations above 500 CFU/mL, heterotrophic bacteria can interfere with some total coliform and E. coli recovery methods." - See more at: http://www.moldbacteriaconsulting.com/bacteria/heterotrophic-plate-count-what-is-hpc-and-when-is-the-right-time-to-use-it.html#sthash.T3DRwAah.dpuf

Referenced Standards:

TC ACTION:
Reject

TC SUBSTANTIATION:
Filtration alone doesn't eliminate the need for testing. Contamination can be introduced after the filter. Important to monitor water quality in case of system failure.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
ALLEN: See comments in proposal.
SHAPIRO: Less regulation and monitoring.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	A 101.5.2
Proposed Text:	**A 101.5.2 Maintenance Log.** A maintenance log for potable rainwater catchment systems should ~~shall~~ be maintained by the property owner ~~and be available for inspection~~. The property owner or designated appointee should ~~shall~~ ensure that a record of testing, inspection and maintenance as required by Table A 101.5.1 is maintained in the log. The log will indicate the frequency of inspection, and maintenance for each system. ~~A record of the required water quality tests shall be retained for not less than 2 years.~~
Problem Statement:	This should be encouraged, but not required. There is no similar requirement for well owners, or septic system owners, or hot-tub owners, etc. These other systems require upkeep and maintenance and it is the system owners responsibility. Rainwater Catchment systems should be regulated constantly with other similar systems, otherwise this regulation puts an unequal burden on rainwater system owners.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Proposal contains non-mandatory language. The need to perform testing needs to be maintained.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	A 101.7
Proposed Text:	**A 101.7 Minimum Water Quality Requirements.** The minimum water quality for all potable rainwater catchment systems shall meet the applicable water quality requirements for a drinking water well as a water supply as determined by the Authority Having Jurisdiction. In the absence of water quality requirements, the guidelines EPA/625/R-04/108 contains recommended water reuse guidelines to assist regulatory agencies develop, revise, or expand alternate water source water quality standards.
Problem Statement:	Potable rainwater systems should be regulated for water quality consistent for requirements for drinking water wells in the jurisdiction.
Referenced Standards:	EPA/625/R-04/108

Note: The EPA/625/R-04/108 does not meet the requirements for a mandatory reference standard in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Reject

TC SUBSTANTATION:
Additional clarity is needed.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NOT RETURNED: 3 Gray, Tabakh, White

Name:	Josh Jacobs
Organization:	UL
Recommendation:	Revise text
Section Number:	A 103.2 and A 104.5.1, Table 901.1
Proposed Text:	**A 103.2 Rainwater Catchment System Drainage Materials.** Gutters and downspouts used in rainwater catchment drainage systems shall comply with NSF Protocol P151, and leaders and conductors shall be listed to NSF 61 and NSF 372. **A 104.5.1 Construction.** Rainwater storage tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be watertight. Storage tanks or storage tank liners and coatings shall be listed to NSF 61 and NSF 372 and approved by the Authority Having Jurisdiction for potable water applications, provided such tanks comply with approved applicable standards.

TABLE 901.1
REFERENCED STANDARDS

STANDARD NUMBER-YEAR	STANDARD TITLE	REFERENCED SECTION
NSF-372 2011	Drinking Water System Components – Lead Content	A 103.2, A 104.5.1

(portions of table not shown remain unchanged)

Problem Statement:	With the change to the Safe Drinking Water Act that took effect on January 4, 2014 regarding maximum lead content it would be appropriate to include listing to NSF 372 to help ensure that all products used for potable use do not contain potential harmful levels of lead.
Referenced Standards:	NSF 372-2011

Note: NSF 61 and NSF 372 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

Note: NSF Protocol P151 was not developed via an open process having a published development procedure in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Reject

TC SUBSTANTIATION:
Already covered in NSF 61. The addition of NSF 372 is not necessary and does not improve upon the current language already. NSF P151 covers lead.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	Table A 104.2.1
Proposed Text:	**TABLE A 104.2.1** **MINIMUM WATER QUALITY** Escherichia coli (fecal coliform): Non-detectable ~~Protozoan Cysts:~~ ~~Non-detectable~~ ~~Viruses:~~ ~~Non-detectable~~ Turbidity: <0.3 NTU
Problem Statement:	Testing for protozoan cysts and viruses is incredibly expensive and won't ensure the water system is safe. This regulation should require the use of adequate filtration and disinfection to ensure the water is safe, and NOT require any testing of cysts or viruses. There are over 300,000 types of viruses that infect mammals, and at least 12 common human waterborne disease viruses. Just to test for 2 highly common viruses, norovirus and enterovirus, would cost around $2,5000 per sample. Common cysts- giardia and cryptosporidium cost over $500 per sample. Any treatment system should be certified to remove these viruses and cysts.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
MAJEROWICZ: $2,5000 must be a misprint

EXPLANATION OF NEGATIVE:
MANN: I for one have never put cost above health and safety. It appears this proponent does.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete text
Section Number:	A 104.2.3
Proposed Text:	~~**A 104.2.3 Maintenance.** Normal system maintenance shall require system testing every 3 months in accordance with Table A 104.2.3. Upon failure of the fecal coliform test, system shall be re-commissioned involving cleaning, and retesting in accordance with section A104.2.~~
Problem Statement:	Rational: After initial testing the maintenance and monitoring should be left to the system owner. There are no similar requirements for owners of drinking water wells and to place more testing requirements on a rainwater systems owner places an unfair burden upon them. They SHOULD be required to upkeep their filtration and disinfection system, which would prevent potential issues with water quality. Testing every 3 months, or annually, is not helpful or necessary.
Referenced Standards:	

Staff note. This will also delete Table A104.2.3. As such this proposal should be heard at the same time with Item #158.

TC ACTION:
Reject

TC SUBSTANTIATON:
Maintenance testing is important in order to help protect the health of users of this water.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 23, NEGATIVE: 2, NOT RETURNED: 3 Gray, Sovocool, Tabakh

EXPLANATION OF NEGATIVE:
KRAUSE: Agree with problem statement.
SHAPIRO: Less oversight is needed, leave it to property owner.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Delete table
Section Number:	TABLE A 104.2.3
Proposed Text:	~~**TABLE A 104.2.3**~~ ~~**MINIMUM SYSTEM MAINTENANCE REQUIREMENTS**~~ ~~Escherichia coli (fecal coliform):~~ ~~Non-detectable~~ ~~Turbidity:~~ ~~<0.3 NTU~~
Problem Statement:	Rational: There are already requirements to upkeep the filtration and disinfection system, which ensures the safety of the water to drink. Drinking water wells do not require annual water quality testing- it is up to the well owner to maintain the system adequately. Rainwater systems should be regulated the same, otherwise it places an unfair burden on rainwater system owners. Additionally, annual testing does nothing to ensure the water quality is good, the quality changes frequently (any time a bird flies over and poops on the roof) and so the emphasis should be on installing and educating the user on how to maintain the water treatment system.
Referenced Standards:	

TC ACTION:
Reject

TC SUBSTANTIATION:
Maintenance requirements are necessary to coordinate with text in Section A 104.2.3.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
ALLEN: Same comments as in item. This standard should require adequate protection with filters and disinfection systems. Unless testing is done daily, it won't ensure the system is safe.
SHAPIRO: Less monitoring good for subsurface irrigation.

Name:	Laura Allen
Organization:	Greywater Action
Recommendation:	Revise text
Section Number:	A 104.3.1
Proposed Text:	**A 104.3.1 Filtration Devices.** Potable water filters shall comply with NSF 53 and shall be installed in accordance with manufacturer's instructions. A minimum of two inline filters, one 5 micron filter followed by one 0.5-1 micron filter shall be installed prior to the disinfection system.
Problem Statement:	Rational: Rather than requiring expensive testing for viruses and cysts the code should require filters and disinfection that will remove them to ensure the long-term potable quality of the water.
Referenced Standards:	

Note: NSF53-2014 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: The proponent is stating that the two filters will remove viruses and cysts. There is no documentation that this statement is accurate.

Name:	Cambria McLeod
Organization:	Kohler
Recommendation:	Revise text
Section Number:	A 104.6
Proposed Text:	**A 104.6 Pumps**. Pumps serving rainwater catchment systems shall be listed for potable water use. Pumps supplying water to water closets, urinals, and trap primers shall be capable of delivering not less than ~~15 pounds-force per square inch (psi) (103 kPa)~~ the minimum residual pressure required by ~~at~~ the highest and most remote outlet served. Where the water pressure in the rainwater supply system within the building exceeds 80 psi (552 kPa), a pressure reducing valve reducing the pressure to 80 psi (552 kPa) or less to water outlets in the building shall be installed in accordance with the plumbing code.
Problem Statement:	Per ASME A112.19.2, the testing requirements for products, specifically flushometer water closets, are such that the residual pressure is higher than 15psi. In the interest of clarity, consistency and product performance, the system should be designed to accommodate the relevant fixture requirements. (Provided for reference: ASME A112.19.2 UPDATE, Table 5.)
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: Not enforceable, who will determine the pressure?

Name:	IAPMO Staff – Update Extracts
Recommendation:	Revise text
Section Number:	B 101.1 – B 101.4
Proposed Text:	**B 101.0 Vacuum Drainage Systems.** **B 101.1 General.** This section regulates the design and installation provisions for vacuum waste drainage systems. Plans for vacuum waste drainage systems shall be submitted to the Authority Having Jurisdiction for approval and shall be considered an engineered designed system. Such plans shall be prepared by a registered ~~or licensed person~~ design professional to perform plumbing design work. Details are necessary to ensure compliance with the requirements of this section, together with a full description of the complete installation including quality, grade of materials, equipment, construction, and methods of assembly and installation. Components, materials, and equipment shall comply with Section 302.1 or approved by the Authority Having Jurisdiction and other national consensus standards applicable to plumbing systems and materials. Where such standards and specifications are not available, alternate materials and equipment shall be approved in accordance with Section 102.0. [UPC C ~~7.1~~ 501.0] **B 101.2 System Design.** Vacuum waste drainage systems shall be designed and installed in accordance with the manufacturer's installation instructions. A vacuum waste drainage system shall include a vacuum generating system, waste collection center, piping network, vacuum valve, and control components used to isolate the vacuum piping network from atmospheric pressure and to collect waste at its point of origin. Where a vacuum system provides the only means of sanitation, duplicate vacuum generating equipment set to operate automatically shall be installed to allow the system to continue in operation during periods of maintenance. [UPC C ~~7.2~~ 501.2] **B 101.2.1 Vacuum Generating System.** The vacuum generating station shall include vacuum pumps to create a constant vacuum pressure within the piping network and storage tanks. The discharge from the tank shall be through an air gap in accordance with the plumbing code. Operation of pumps, collection tanks, and alarms shall be automated by controls. The vacuum pumps shall be activated on demand and accessible for repair or replacement. The vent from the vacuum pump shall be provided for vacuum pump air exhaust, and shall be of a size capable of handling the total air volume of the vacuum pump. [UPC C ~~7.2.1~~ 501.2.1] **B 101.2.2 Waste Collection Center or Storage Tanks.** Vacuum collection center or storage tanks shall be of such capacity as to provide storage of waste to prevent fouling of the system. Such collection or storage tank shall be capable of withstanding 150 percent of the rated vacuum (negative pressure) created by the vacuum source without leakage or collapse. Waste collection center or storage tanks shall be accessible for adjustment, repair, or replacement. [UPC C ~~7.2.2~~ 501.2.2] **B 101.2.3 Piping Network.** The piping network shall be under a continuous vacuum and shall be designed to withstand 150 percent of the vacuum (negative pressure) created by the vacuum source within the system without leakage or collapse. Sizing the piping network shall be in accordance with the manufacturer's instructions. The water closet outlet fitting shall connect with a piping network having not less than a 1½ inch (40 mm) nominal inside diameter. [UPC C ~~7.2.3~~ 501.2.3] **B 101.2.4 Vacuum Interface Valve.** A closed vacuum interface valve shall be installed to separate the piping network vacuum from atmospheric pressure. A control device shall open the vacuum interface valve where a signal is generated to remove waste from the plumbing fixture. [UPC C ~~7.2.4~~ 501.2.4]

	B 101.2.5 Control Components. Where a pneumatic signal is generated at the controller, a vacuum from the system to open the extraction valve shall be designed to operate where vacuum pressure exists to remove the accumulated waste. Each tank shall incorporate a level indicator switch that automatically controls the discharge pump and warns of malfunction or blockage as follows: (1) Start discharge. (2) Stop discharge. (3) Activate an audible alarm where the level of effluent is usually high. (4) Warning of system shutdown where tank is full. [UPC C ~~7.2.5~~ 501.2.5] **B 101.3 Fixtures.** Fixtures utilized in a vacuum waste drainage system shall comply with Section 302.1. Components shall be of corrosion resistant materials. The water closet outlet shall be able to pass a 1 inch (25.4 mm) diameter ball and shall have a smooth, impervious surface. The waste outlet and passages shall be free of obstructions, recesses, or chambers that are capable of permitting fouling. The mechanical valve and its seat shall be of such materials and design to provide a leak-free connection where at atmospheric pressure or under vacuum. The flushing mechanism shall be so designed as to ensure proper cleansing of the interior surfaces during the flushing cycle at a minimum operating flow rate. Mechanical seal mechanisms shall withdraw completely from the path of the waste discharge during flushing operation. Each mechanical seal vacuum water closet shall be equipped with a listed vacuum breaker. The vacuum breaker shall be mounted with the critical level or marking not less than 1 inch (25.4 mm) above the flood-level rim of the fixture. Vacuum breakers shall be installed on the discharge side of the last control valve in the potable water supply line and shall be located so as to be protected from physical damage and contamination. [UPC C ~~7.3~~ 501.3] **B 101.4 Drainage Fixture Units.** Drainage fixture units shall be determined by the manufacturer's instructions. The pump discharge load from the collector tanks shall be in accordance with this appendix. [UPC C ~~7.4~~ 501.4] **B 101.5 Water Supply Fixture Units.** Water supply fixture units shall be determined by the manufacturer's instructions. [UPC C ~~7.5~~ 501.5] **B 101.6 Materials.** Materials used for water distribution pipe and fittings shall be in accordance with the plumbing code. Materials used for aboveground drainage shall be in accordance with the plumbing code and shall have a smooth bore, and be constructed of non-porous material. [UPC C ~~7.6~~ 501.6] **B 101.7 Traps and Cleanouts.** Traps and cleanouts shall be installed in accordance with the plumbing code. [UPC C ~~7.7~~ 501.7] **B 101.8 Testing.** The entire vacuum waste system shall be subjected to a vacuum test of 29 inches of mercury (98 kPa) or not less than the working pressure of the system for 30 minutes. The system shall be gastight and watertight at all points. Verification of test results shall be submitted to the Authority Having Jurisdiction. [UPC C ~~7.8~~ 501.8] **B 101.9 Manufacturer's Instructions.** Manufacturer's instructions shall be provided for the purpose of providing information regarding safe and proper operating instructions whether or not as part of the condition of listing in order to determine compliance. Such instructions shall be submitted and approved by the Authority Having Jurisdiction. [UPC C ~~7.9~~ 501.9]
Problem Statement:	The above sections have been revised to correlate with the Uniform Plumbing Code (latest version) in accordance with the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard (Extract Guidelines)
Referenced Standards:	

TC ACTON:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Submitter:	Josh Jacobs
Organization:	UL
Recommendation:	Add text
Section Number:	Appendix C, Table 901.1

Proposed Text:

Appendix C Product Environmental Impact Transparency

C 101.0 Environmental Product Declarations.

C 101.1 General. This Appendix details how the use of environmental product declarations (EPD) can be utilized in understanding the environmental impact of products throughout their life cycle.

C 101.2 Eligible Products. Any permanently installed product or material that touches or utilizes water for use in a building. Any non-permanently installed product that utilizes or touches water in its intended use.

C 101.3 Environmental Product Declarations. All EPDs shall be consistent with ISO 14025 and ISO 21930, with at least a cradle to gate scope.

C 101.3.1 Industry-Wide Declaration. A Type III industry-wide declaration shall be a program operator explicitly recognizes the EPD as representative of the product group on a national level. The manufacturer of the product submitting the industry-wide EPD shall be explicitly recognized participant in its development by the program operator.

C 101.3.2 Product-Specific Declaration. A Type III product-specific declaration shall be manufacturer specific for a product family.

TABLE 901.1
REFERENCED STANDARDS

STANDARD NUMBER-YEAR	STANDARD TITLE	REFERENCED SECTION
ISO 14025	Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures	C 101.3
ISO 21930	Sustainability in building construction -- Environmental declaration of building products	C 101.3

(portions of table not shown remain unchanged)

Problem Statement:

Ensuring our water is conserved is a very important, but small part of the overall picture that needs to be looked at when thinking of our water systems as sustainable. What if a product helps an end user conserve water, but is potentially adding to eutrophication during its manufacturing process...is that truly a sustainable product? The demand for transparency is expanding in response to new green government and commercial procurement policies. Many organizations are now conducting life cycle assessments on many of their products, not necessarily only to understand the environmental impacts, but mostly to understand good business practices. Many of these life cycle assessments are not public information as they are very detailed and contain proprietary information that manufacturers do not want in the public. Environmental Product Declarations though are a way to 'translate' this

	invaluable environmental impact information into an understandable, easier to digest, and useable form. The demand for transparency is expanding in response to new green government and commercial procurement policies by including this tool at least in the appendix of this standard, we will be showing that we understand the needs of the end user and the trends of the marketplace. We would also be providing a valuable educational tool for some who want this information but do not know how to get it.
Referenced Standards:	ISO 14025 and ISO 21930

Note: ISO 14025 and ISO 21930 meets the requirements for a mandatory referenced standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

Staff note: An electronic copies will be forthcoming or a hard copies will be available to the WE-Stand Technical Committee for review at the April 4-5, 2016 WE-Stand TC Meeting.

TC ACTION:
Reject

TC SUBSTANTIATION:
Copies of the Standards were not submitted by proponent as required by IAPMO regs.

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 1, NOT RETURNED: 3 Gray, Saltzberg, Tabakh

EXPLANATION OF NEGATIVE:
RAWALPINDAWALA: Support acknowledgement but the proposal does not enhance current language.

Name:	WE-Stand Technical Committee
Recommendation:	Revise text
Section Number:	206.0
Recommendation:	**206.0** **Debris Excluder.** A device installed on ~~the~~ a rainwater or stormwater catchment conveyance system to prevent the accumulation of leaves, needles, or other debris in the system.
TC Substantiation:	This device and equivalent are necessary for both all nonpotable water sources/systems, not just rainwater harvesting systems. Definition should be broadened.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	WE-Stand Technical Committee
Recommendation:	Revise Text
Section Number:	206.0
Task Group Recommendation:	**206.0** **Dry Weather Runoff.** Water that flows along a surface, in a channel or sub-surface including groundwater seepage, and is not associated with a <u>rain event</u> ~~rainwater catchment system or stormwater catchment system~~.
TC Substantiation:	Better clarification of definitions. More complete and accurate. No need to mention a catchment system.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	WE-Stand Technical Committee
Recommendation:	Delete text
Section Number:	221.0
Task Group Recommendation:	**221.0** ~~**Storage Tank (rainwater, stormwater or dry weather runoff).** The central component of the rainwater, stormwater or dry weather runoff catchment system used for storing water at atmospheric pressure. Also known as a cistern or rain barrel.~~
TC Substantiation:	Storage tank is clearly understood and is defined in the dictionary.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
SHAPIRO: The instructions should state Delete Text, NOT Revised Text. There is no longer any text.

Name:	WE-Stand Technical Committee
Recommendation:	Revise text
Section Number:	**221.0**
Task Group Recommendation:	**221.0** **Stormwater Catchment System.** A system that collects and stores stormwater for the intended purpose of ~~a~~ beneficial use. Also known as Stormwater Harvesting System.
Problem Statement:	Added language to make this definition consistent with the definition for Rainwater Catchment System.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	WE-Stand Technical Committee
Recommendation:	Revise text
Section Number:	414.12
Task Group Recommendation:	**414.12 ~~Irrigation Zone Performance Criteria.~~ Irrigation System Inspection and Performance Check.** ~~Irrigation zones shall be designed and installed to ensure the average precipitation rate of the sprinkler heads over the irrigated area does not exceed 1.0 inch per hour as verified through either of the following methods:~~ ~~(a) manufacturer's documentation that the precipitation rate for the installed sprinkler head does not exceed 1.0 inches per hour where the sprinkler heads are installed no closer that the specified radius and where the water pressure of the irrigation system is no greater than the manufacturer's recommendations.~~ ~~(b) catch can testing in accordance with the requirements of the Authority Having Jurisdiction and where emitted water volume is measured with a minimum of 6 catchment containers at random places within the irrigation zone for a minimum of 15 minutes to determine the average precipitation rate, expressed as inches per hour~~ The irrigation system shall be inspected by the Authority Having Jurisdiction or by an independent third party having credentials in accordance with the US EPA WaterSense program. The performance check shall determine compliance with the irrigation design by verifying the following: (1) Sprinklers shall be installed as specified with proper spacing and required nozzle. (2) Sprinklers shall be activated and visually inspected that they cover areas without causing overspray or runoff. (3) Valves shall be installed as specified. (4) Drip irrigation systems shall have the proper valve, pressure regulation, filtering device, location of flush valves, and that the installed emitters comply with the irrigation plan. (5) Control system shall be installed as specified and includes a US EPA WaterSense labeled controller and all sensors are installed and verified for proper operation. (6) The peak demand irrigation schedule shall be posted near the controller or the scheduling parameters for the controller are listed for each station including cycle and soak times. (7) Record drawings of the irrigation system shall be completed and are used for the irrigation inspection. (8) A report of the inspection shall be provided at a minimum to the property owner or management company identifying problems and what corrective actions are required.
Problem Statement:	Inspecting the installed irrigation system will provide a way to verify that the appropriate equipment has been installed as per design and in case there is not a design, it at least allows for the visual inspection of the equipment installed to make sure it is operating correctly and applying water where it is intended to avoid runoff or overspray.
Referenced Standards:	EPA WaterSense Professional Certification Program https://www3.epa.gov/watersense/outdoor/cert_programs.html

Note: US EPA WaterSense Professional Certification Program was not developed via an open process having a published development procedure in accordance with Section 15.2 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NEGATIVE: 1, NOT RETURNED: 2 Gray, Tabakh

EXPLANATION OF NEGATIVE:
MANN: Prefer the existing language with no reference to WaterSense.

Name:	WE-Stand Technical Committee
Recommendation:	Add text
Section Number:	414.X
Task Group Recommendation:	**414.X Irrigation Flow Sensing System.** On commercial landscape irrigation systems, an irrigation flow sensing system shall be installed that shall interface with the control system to suspend irrigation for abnormal flow conditions. If equipped with totalizer capabilities, the irrigation flow sensing system shall also function as a meter for irrigation water.
Problem Statement:	An irrigation flow sensing system in combination with a controller can suspend the irrigation system or irrigation zone when there are flows that are considered abnormal such as a missing nozzle, broken sprinkler or broken pipe. If the flow sensor is equipped with a totalizer then it can also function as a meter for irrigation water.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, NOT RETURNED: 2 Gray, Saltzberg, Tabakh

Name:	WE-Stand Technical Committee
Recommendation:	Add text
Section Number:	417.5
Task Group Recommendation:	**417.5 Pool Pumps and Replacement Pool Pump Motors.** Pool pumps and replacement pool pump motors shall meet requirements of APSP-15.
Problem Statement:	APSP-15 is a standard reducing energy use through more efficient pumps and limiting the size and performance of those pumps based on pool size.
Referenced Standards:	APSP-15

Note: APSP 15 meets the requirements for a mandatory reference standard in accordance with Section 15.0 of the Regulations Governing Consensus Development of the Water Efficiency and Sanitation Standard.

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
SOVOCOOL: This appears to be the second time voting on TCP 7. Is it possible there is a problem with duplicative ballots for this one.

Name:	WE-Stand Technical Committee
Recommendation:	Add text
Section Number:	206.0
Proposed Text:	**Disposal Field.** An intended destination for gray water, including but not limited to, a mulch basin or receiving landscape feature, gray water leach field, or other approved method of disposal.
Problem Statement:	Rational: Definition needed for term used within document
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 26, NOT RETURNED: 2 Gray, Tabakh

Name:	WE-Stand Technical Committee
Recommendation:	Add text
Section Number:	Appendix X – new Appendix
Task Group Recommendation:	**Appendix X** **Design of the Water Distribution System for Residential Dwellings with Efficient Plumbing Fixtures** **X 101.0 General.** **X 101.1 Applicability.** The intent of this appendix is to provide a method for sizing a water supply distribution system for single- and multi-family dwellings with efficient water-conserving plumbing fixtures, fixture fittings, and appliances. **X 102.0 Design Criteria** **X 102.1 Fixtures.** Plumbing fixtures, fixture fittings, and appliances shall not exceed the flow rate and flush volume in Table X 102.1. **X 102.2 Sizing Method**. The water distribution system shall be sized in accordance with Section X 102.2.1 through X 102.2. 5. **X 102.2.1 Meter, Building Supply and Branches.** The estimated design flow rate for the water meter, building supply, and branches shall be directly calculated using Equation X 102.2.1 and rounded to the nearest whole number. See [hyperlink] for a downloadable sizing calculator in Microsoft Office Excel file as seen in the sizing example below. The number of each kind of fixtures or fixture groups shall be counted in the spreadsheet. The flow rate (q) and probability (p) values for the Equation X 102.2.1 shall not exceed the design values in Table X 102.1 **X 102.2.2 Fixture Branches and Fixture Supplies**. The flow rate for one fixture branch and fixture supply shall be the design flow rate of the fixture using Table X 102.1. Where the maximum fixture flow rate is less than the design flow rate in Table X 102.1, the lesser flow rate shall be permitted. Where the demand calculated with Equation X 102.2.1 for a supply branch serving two fixture branches is greater than the sum of the two fixture's maximum flow rate, the sum shall be used for the supply branch flow rate. Rounding shall be to the nearest whole number. **X 102.2.3 Sizing for Velocity**. The estimated design flow rate for the building supply, branches and fixture supplies shall not exceed ten feet per second (10 ft/sec). Velocity limitations for the cold and hot water supply pipe diameters shall be applied to Table X 102.2.3 or shall be in accordance with the manufacturer's specifications for the type of pipe material. **X 102.2.4 Pressure Loss Due to Pipe Friction.** Pressure loss due to pipe friction shall be determined by accepted Engineering calculations. Accepted Engineering calculations include the Hazen-Williams and the Darcy-Weisbach formulae. **X 102.2.5 Continuous Supply Demand**. Continuous supply demands in gallons per minute (gpm) for lawn sprinklers, air conditioners, etc., shall be added to the total estimated demand for the Building Supply. **X 102.2.6 Other Fixtures**. Fixtures not included in Table X 102.1 shall have the design flow rate specified by the manufacturer. The p-value shall approximate the design p-value of a fixture having a similar frequency of use in Table X 102.1.

$$Q_{0.99} = \frac{1}{1-P_0}\left[\sum_{k=1}^{K} n_k p_k q_k + (z_{0.99})\sqrt{\left[(1-P_0)\sum_{k=1}^{K} n_k p_k (1-p_k) q_k^2\right] - P_0\left(\sum_{k=1}^{K} n_k p_k q_k\right)^2}\right]$$ (Equation X 102.2.1)

Where: $Q_{0.99}$ = estimated design flow rate (gpm) in the 99th percentile
q = design flow rate of an individual fixture (Table X 102.1)
n = number of fixtures of the same kind
K = number of distinct fixture groups (as listed in Table X 102.1)
p = probability of single fixture use (design p-value in Table X 102.1)
P_0 = probability of no flow given by $(1-p_1)^{n_1}(1-p_2)^{n_2}\cdots(1-p_K)^{n_K}$
$z_{0.99}$ = 99th percentile of the standard normal distribution (z = 2.33)

Table X 102.1
Design Parameters for Water-Conserving Plumbing Fixtures in Residential Occupancies

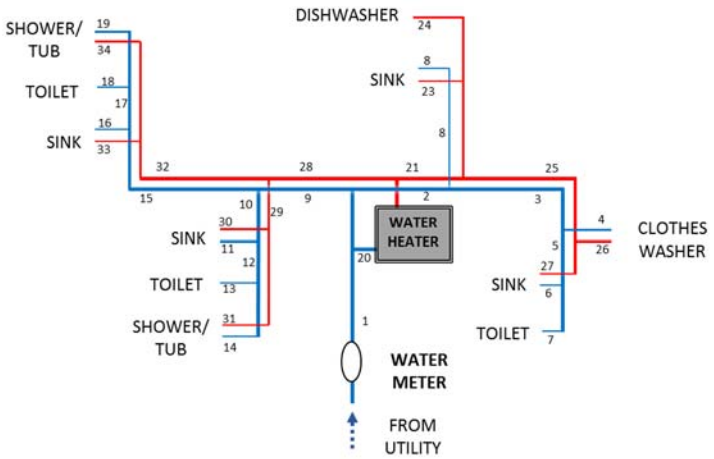
FIXTURE	DESIGN FLOW RATE (GPM)	DESIGN P-VALUE
Shower	2.0	0.025
Combination Tub/Shower	4.5	0.030
Tub Filler – Standard Standalone Bathtub[1]	7.0	0.005
Water Closet Gravity Tank – 1.28gpf	4.0	0.010
Lavatory Faucet	1.5	0.025
Kitchen Faucet	2.2	0.025
Dishwasher[2]	1.6	0.005
Clothes Washer[2]	4.5	0.050
Laundry Faucet (with aerator)	2.0	0.025
Bathroom Group – Lavatory, Water Closet, Combination Tub/Shower	7.0	0.065
Kitchen Group – Kitchen Faucet , Dishwasher	3.8	0.030

[1] For high-flow tub fillers, the design flow rate shall be determined by the fixture fitting flow rate specification. The high-flow tub fixture shall not be subject to a fixture-use probability to determine pipe size.
[2] Clothes Washers and dishwashers shall have an Energy Star label.

Table X 102.2.3
Maximum Flow Rate (gpm) for Pipe Diameters
(Smooth pipe – L-copper)

Maximum Flow Rate at 5 f/s						
3/8	**1/2**	**3/4**	**1**	**1 1/4**	**1 1/2**	**2**
2	4	8	13	20	28	48
Maximum Flow Rate at 8 f/s						
3/8	**1/2**	**3/4**	**1**	**1 1/4**	**1 1/2**	**2**
4	6	12	21	31	44	77
Maximum Flow Rate at 10 f/s						
3/8	**1/2**	**3/4**	**1**	**1 1/4**	**1 1/2**	**2**
5	7	15	26	39	55	97

Figure X 102.2 Example Illustrating the Sizing Method



Pipe Section	Flow Rate gpm	Pipe Diameter (nominal inches)
1	12	3/4
2	7	3/4
3	7	3/4
4	4.5	1/2
5	5	1/2
6	1.5	3/8
7	4	3/8
8	2.2	3/8
9	10	3/4
10	7	3/4
11	1.5	3/8
12	5	1/2
13	4	3/8
14	4.5	1/2
15	7	3/4
16	1.5	3/8
17	5	1/2
18	4	3/8
19	4.5	1/2
20	8	3/4
21	7	3/4
22	4	3/8
23	2	3/8
24	1.6	3/8
25	6	1/2
26	4.5	1/2
27	1.5	3/8
28	7	3/4
29	6	1/2
30	1.5	3/8
31	4.5	1/2
32	6	1/2
33	1.5	3/8
34	4.5	1/2

Sizing for Pipe Section 1 – Building Supply

Fixture type	n	p	q	npq	np(1-p)q^2	Po	
	Count	Probability	Flow rate gpm	Mean Flow gpm	Flow variance $(gpm)^2$	Prob. No flow	Max po
Shower	0	0.025	2.0	0.0000	0.0000	1.0000	
Tub/Shower Combo	0	0.030	4.5	0.0000	0.0000	1.0000	
Tub Filler - Stand alone Bathtub	0	0.005	7.0	0.0000	0.0000	1.0000	
Water Closet, Gravity Tank	1	0.010	4.0	0.0400	0.1584	0.9900	
Lavatory Faucet	1	0.025	1.5	0.0375	0.0548	0.9750	
Kitchen Sink Faucet	0	0.025	2.2	0.0000	0.0000	1.0000	
Dishwasher	0	0.005	1.6	0.0000	0.0000	1.0000	
Clothes washer	1	0.050	4.5	0.2250	0.9619	0.9500	
Laundry Sink Faucet	0	0.025	2.0	0.0000	0.0000	1.0000	
Bathroom Group	2	0.065	7.0	0.9100	5.9560	0.8742	
Kitchen Group	1	0.030	3.8	0.1140	0.4202	0.9700	
Total	**6**			**1.3265**	**7.5513**	**0.7776**	
			Busy time	**5.9646**	**6.2899**		
Z value	2.326						
Demand Q	**12**	**gpm**					

1. In the second column (n), list the number of bathroom groups and kitchen groups for the whole house. List additional fixtures that are not included in the groups. The spreadsheet will automatically calculate the demand (Q) for the Building Supply.
2. Add any continuous supply demands to the peak demand estimate.
3. Use Table X 102.2.3 to determine the pipe diameter. At 8 ft/sec, the pipe diameter for 12 gpm is ¾-inch.

Sizing for Pipe Section 2 – Cold Water Supply Branch

Fixture type	n	p	q	npq	np(1-p)q^2	Po	
	Count	Probability	Flow rate gpm	Mean Flow gpm	Flow variance $(gpm)^2$	Prob. No flow	Max pc
Shower	0	0.025	2.0	0.0000	0.0000	1.0000	
Tub/Shower Combo	0	0.030	4.5	0.0000	0.0000	1.0000	
Tub Filler - Stand alone Bathtub	0	0.005	7.0	0.0000	0.0000	1.0000	
Water Closet, Gravity Tank	1	0.010	4.0	0.0400	0.1584	0.9900	
Lavatory Faucet	1	0.025	1.5	0.0375	0.0548	0.9750	
Kitchen Sink Faucet	1	0.025	2.2	0.0550	0.1180	0.9750	
Dishwasher	0	0.005	1.6	0.0000	0.0000	1.0000	
Clothes washer	1	0.050	4.5	0.2250	0.9619	0.9500	
Laundry Sink Faucet	0	0.025	2.0	0.0000	0.0000	1.0000	
Bathroom Group	0	0.065	0.0	0.0000	0.0000	1.0000	
Kitchen Group	0	0.030	0.0	0.0000	0.0000	1.0000	
Total	**4**			**0.3575**	**1.2931**	**0.8941**	
			Busy time	**3.3746**	**2.0245**		
Z value	2.326						
Demand Q	**7**	**gpm**					

1. In the second column (n), list the number of fixtures for the cold water supply for Pipe Section 2. The cold water supply at Pipe Section 2 serves (1) water closet, (1) lavatory faucet, (1) kitchen faucet, and (1) clothes washer. The spreadsheet will automatically calculate the demand (Q) for the cold water branch.
2. Use Table X 102.2.3 to determine the pipe diameter. At 8 ft/sec, the pipe diameter for 7 gpm is ¾-inch.

Pipe Section 28 – Hot Water Supply Branch

ture type	n	p	q	npq	np(1-p)q^2	Po	nq
	Count	Probability	Flow rate gpm	Mean Flow gpm	Flow variance $(gpm)^2$	Prob. No flow	Max possible flow gpm
	0	0.025	2.0	0.0000	0.0000	1.0000	0.0
Combo	2	0.030	4.5	0.2700	1.1786	0.9409	9.0
and alone Bathtub	0	0.005	7.0	0.0000	0.0000	1.0000	0.0
Gravity Tank	0	0.010	4.0	0.0000	0.0000	1.0000	0.0
et	2	0.025	1.5	0.0750	0.1097	0.9506	3.0
Faucet	0	0.025	2.2	0.0000	0.0000	1.0000	0.0
	0	0.005	1.6	0.0000	0.0000	1.0000	0.0
er	0	0.050	4.5	0.0000	0.0000	1.0000	0.0
Faucet	0	0.025	2.0	0.0000	0.0000	1.0000	0.0
oup	0	0.065	0.0	0.0000	0.0000	1.0000	0.0
p	0	0.030	0.0	0.0000	0.0000	1.0000	0.0
	4			**0.3450**	**1.2882**	**0.8944**	**12.0**
			Busy time	**3.2684**	**2.6495**		
	2.326						
	7	**gpm**					

1. In the second column (n), list the number of fixtures for the hot water supply for Pipe Section 28. The hot water supply at Pipe Section 28 serves (2) combination tub and showers and (2) lavatory faucets. The spreadsheet will automatically calculate the demand (Q) for the hot water branch.

Use Table X 102.2.3 to determine the pipe diameter. At 8 ft/sec, the pipe diameter for 7 gpm is ¾-inch.

Problem Statement:	The computational method presented in Equation X 102.2.1 is the result of a task group five-year study reported in a peer-reviewed unpublished paper (provided upon request). The peer review affirmed the soundness of the statistical method. The input parameters for the equation are the

	number of fixtures (n), fixture flow rates (q), and the probability of fixture use (p). These parameters were derived from a large U.S. database for residential end use of water (Aquacraft, Inc.). A database comprising of over 1000 homes was specially developed for the purpose of querying probabilities and flow rates for various levels of fixture water efficiencies. The fixture probabilities and flow rates in Table X 102.1 are derived from queries for efficient fixture flow rates and probability of use during peak hours. Similar to the criterion used by Dr. Hunter, the estimated peak demand is the 99th percentile (Q_{99}) of all water demands expected at the residence during the design hour. The 99th percentile means there is only a one percent chance that the actual demand will exceed the design demand during the peak hour of water use in the residence. Exceeding the design demand in residential dwellings does not impose severity upon the plumbing system. The efficient fixtures are purposely designed for flows with low intensity and short duration. Exceeding the demand may slightly lengthen the flow duration or slightly reduce the flow rate at the fixture. These effects would probably be imperceptible to the user. The equation works efficiently in an Excel spreadsheet that will be provided for the user by means of a www.link to a downloadable spreadsheet. Snapshots of the spreadsheet are provided in the Example. The values in Table X 102.1 are provided in the spreadsheet, and the only variable the user needs to provide is the number of plumbing fixtures (n) in column 2 of the form. The information in the spreadsheet columns may be useful to the user when needing to evaluate the mean flow rate, the variance, the probability of no flow, and the maximum possible flow if all the fixtures are flowing at the same time. The data shows that simultaneous is infrequent in single family homes as reflected in the spreadsheet calculator. The pipe sizing process is simplified based on velocity limitations. The spreadsheet calculator will provide the estimated demand for all branches in the plumbing system following the provisions in Sections X 102.2.1 and X 102.2.2 as well as the Example. The demand will determine the pipe size according to the velocity requirements shown in Table X 102.2.3. Similar tables can be created for other pipe material using the Hazen-Williams or Darcy-Weisbach formulae. An example of pipe sizing is provided to demonstrate how the spreadsheet calculator works with the velocity table. The velocity table has three variations: for hot water limitations, especially for a circulation system (5 ft/sec); for copper piping systems (8 ft/sec); and for CPVC and PEX according to manufacturer's specifications not to exceed 10 ft/sec. In comparison to the UPC pipe sizing method in Chapter 6, the Example shows pipe reductions for the building water supply and meter, and fixture branches with 3/8-inch diameter. The pipe sizing table justifies the increasing use of 3/8-inch diameter pipe for fixture branches because of the low-flow efficient fixtures. The proof of the adequacy of the proposed method of estimating the demand loads to be expected in residential water-supply systems will, in the end, depend on its success in actual trial over a period of years. Dr. Hunter expressed the same thing when he promoted his curve in 1940. The Hunter method has proven successful with a sparse sample of wake up calls to hotel guests. The proposed method has greater confidence based on 863,000 water use events during 11,385 home-days of monitoring over 1,000 homes. The proposal is recommended for the UPC Appendix as an alternate pipe sizing method for single- and multi-family applications with high-efficiency plumbing fixtures and appliances. The method proposes adequate pipe sizing without excessiveness and may be a factor toward mitigating pathogens due to stagnation. Maintaining the design flow rates at the recommended velocities will ensure pipe scouring that is vital in reducing biofilms. The pipe sizing task group has made every effort to consider adequate sizing for satisfactory use for the residential water supply system.
Referenced Standards:	

TC ACTION:
Accept

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 24, NEGATIVE: 2, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:
KRAUSE: Title does not appear to fit code style, Recommend changing from: Design of the Water Distribution System for Residential Dwellings with Efficient Plumbing Fixtures to: Water Distribution System Design for Residential Dwellings with Efficient Plumbing Fixtures.

EXPLANATION OF NEGATIVE:
MANN: A similar proposal was submitted to the UPC Technical Committee and rejected. The peer reviewed unpublished paper was not provided to the committee. Only available upon request.
TINDALL: Water flows and pipe sizes should be handled in the UPC.

Name:	WE-Stand Technical Committee
Recommendation:	Revise text
Section Number:	503.1
Task Group Recommendation:	**503.1 General**: The provisions of this section shall apply to the installation, construction, alteration, and repair of reclaimed (recycled) water and stormwater systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, aboveground and subsurface irrigation, industrial or commercial cooling or air conditioning and other uses approved by the Authority Having Jurisdiction.
Problem Statement:	This section shall apply to offsite produced recycled water and treated stormwater. Wherever reclaimed (recycled) appears, will need to change to Offsite Treated Nonpotable Water, which is defined in Section 200, definitions. Or can break out into 2 sub-sections, one for reclaimed, and one for stormwater. Internally within 503.0, nothing changes in terms of Reclaimed water protocols, standards. This is a name change for the section, and the addition of stormwater as an alternate water source from offsite treatment, just like Reclaimed water.
Referenced Standards:	

TC ACTION:
Accept
Passed without Quorum

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 25, ABSTENTION: 1, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON ABSTENTION:
MANN: I was not in the room when this Item was being vetted.

Name:	WE-Stand Technical Committee
Recommendation:	Revise text
Section Number:	411.3, 205.0
Proposed Text:	**411.3 Cooling Tower Makeup Water.** ~~Not less than five cycles of concentration is required for air-conditioning cooling tower makeup water having a total hardness of less than 11 gr/gal (188 mg/L) expressed as calcium carbonate. Not less than 3.5 cycles of concentration is required for air-conditioning cooling tower makeup water having a total hardness equal to or exceeding 11 gr/gal (188 mg/L) expressed as calcium carbonate~~. Water used for air-conditioning cooling towers shall not be discharged where the hardness of the basin water is less than 1500 mg/L. **Exception:** Where any of the following conditions of the basin water are present: total suspended solids exceed 25 ppm, $CaCO_3$ exceeds 600 ppm, chlorides exceed 250 ppm, sulfates exceed 250 ppm, or silica exceeds 150 ppm. ~~Where silicon dioxide concentrations measured as silicon dioxide would exceed 120 mg/L, the tower's cycles of concentration shall be permitted to be set to ensure that this level of 120 mg/L is not exceeded, even if the cycles of concentration are lower than levels specified in this section.~~ **205.0** ~~**Cycles of Concentration for Cooling Towers.** Cycles of concentration equals the specific conductance of the water in the cooling tower basin divided by the combined flow weighted average specific conductance of the makeup water(s) to the cooling tower.~~
Problem Statement:	Reason: The proposal accomplishes several needed changes: (1) simplifies the method of determination for discharging water to reduce mineral concentrations, especially when input water quality has seasonal variations; (2) includes needed exceptions for additional water quality issues that can harm equipment; and, (3) eliminates the definition of COC, which is no longer used in the document. Resource: http://www.baltimoreaircoil.com/english/resource-library/file/1976 Operations and Maintenance Manual
Referenced Standards:	

TC ACTION:
Accept
Passed without Quorum

TOTAL ELIGIBLE TO VOTE: 28

VOTING RESULTS: AFFIRMATIVE: 22, NEGATIVE: 2, ABSTENTION: 2, NOT RETURNED: 2 Gray, Tabakh

COMMENT ON AFFIRMATIVE:

PAPE: This is a major improvement over pre-existing language. The criteria is safe levels for galvanized steel components (the most susceptible to damage). Much greater efficiency can be achieved in systems without galvanized steel components.

EXPLANATION OF NEGATIVE:
HOFFMAN: This should also apply to commercial cooling such as grocery store refrigeration and small process loads. We need to revisit this one.
STEFFENSEN: The current proposal does not identify a specific mineral for determining hardness and it is not aligned with the current procedure in California for determining cycles of concentration. The Building Energy Efficiency Standards require the use of the Langelier Saturation Index (LSI) which takes several factors into account, such as M-Alkalinity, Calcium Hardness, Magnesium Hardness, Silica and Conductivity to determine the cooling tower LSI based on calculated pH and the number of cycles before reaching that concentration.

COMMENT ON ABSTENTION:
MANN: I was not in the room when there was debate on this item. I therefore cannot make an informed decision.
RAWALPINDIWALA: Not qualified to make an informed decision.