IRC - Plumbing

2024 GROUP A PROPOSED CHANGES TO THE I-CODES

Committee Action Hearings (CAH #2)
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RP3-24

IRC: P3103.1.2, P3103.1.4

Proposed Change as Submitted

Proponents: Jeanne Rice, NYS DOS, NYS DOS (jeanne.rice@dos.ny.gov); Chad Sievers, NYS, NYS DOS (chad.sievers@dos.ny.gov); Kevin Duerr-Clark, NYS DOS, NYS DOS (kevin.duerr-clark@dos.ny.gov); China Clarke, New York State Dept of State, Manager Technical Support Unit (china.clarke@dos.ny.gov)

2024 International Residential Code

Revise as follows:

P3103.1.2 Roof used for recreational or assembly purposes. ~~Where a roof is to be used for assembly, as a promenade, observation deck or sunbathing deck, or for similar purposes, open vent pipes shall terminate not less than 7 feet (2134 mm) above the roof.~~ Where a roof is to be used as a promenade, restaurant, bar, or sunbathing deck, as an observation deck, or for similar purposes, open vent pipes shall terminate not less than 7 feet (2134 mm) above the roof.

P3103.1.4 Sidewall vent terminal. Vent terminals extending through the wall shall terminate not less than 10 feet (3048 mm) from ~~a~~ the *lot line* and ~~not less than~~ 10 feet (3048 mm) above the highest adjacent grade ~~elevation~~ within 10 feet (3048 mm) ~~in any direction~~ horizontally of the vent terminal. V~~ent pipes shall not terminate under the overhang of a structure where the overhang includes soffit vents. Such vent terminals shall be protected by a method that prevents birds and rodents from entering or blocking the vent pipe opening and that does not reduce the open area of the vent pipe.~~
Vent terminals shall not terminate under the overhang of a structure with soffit vents. Sidewall vent terminals shall be protected to prevent birds and rodents from entering or blocking the vent opening.

Reason: The language in sections 3103.1.2 and 3103.1.4 (IRC) do not match sections 903.1.2 and 903.1.4 of the IPC. This proposed change edits the IRC provisions to match the ones found in the IPC.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed change merely edits the provision language to match the IPC. The code requirements are not changed, merely edited into a more clear format.

RP3-24

Public Hearing Results (CAH1)

Committee Action: **Disapproved**

Committee Reason: The terms "restaurants" and "bars" are inappropriate for the IRC. This section doesn't need to match the IPC. (10-0)

RP3-24

Individual Consideration Agenda

Comment 1:

IRC: P3103.1.2, P3103.1.4

Proponents: Jeanne Rice, NYSDOS (jeanne.rice@dos.ny.gov); Chad Sievers, NYS, NYS DOS (chad.sievers@dos.ny.gov); Kevin Duerr-Clark, NYS DOS, NYS DOS (kevin.duerr-clark@dos.ny.gov); Stephen Van Hoose, NYS DOS, NYS DOS (stephen.vanhoose@dos.ny.gov); China Clarke, New York State Dept of State, Manager Technical Support Unit (china.clarke@dos.ny.gov) requests As Modified by Committee (AMC2)

Modify as follows:

2024 International Residential Code

P3103.1.2 Occupiable Roofs ~~Roof used for recreational or assembly purposes.~~ ~~Where a roof is to be used as a promenade, restaurant, bar, or sunbathing deck, as an observation deck, or for similar purposes, open~~ Open vent pipes which are to be located within 7 feet of an occupiable roof shall terminate not less than 7 feet (2134 mm) above ~~the~~ such roof.

P3103.1.4 Sidewall vent terminal. Vent terminals extending through the wall shall terminate not less than 10 feet (3048 mm) from the *lot line* and 10 feet (3048 mm) above the highest adjacent grade within 10 feet (3048 mm) horizontally of the vent terminal. V
Vent terminals shall not terminate under the overhang of a structure with soffit vents. Sidewall vent terminals shall be protected to prevent birds and rodents from entering or blocking the vent opening.

Reason: The committee denied this proposal at CAH1, stating that:
"The terms "restaurants" and "bars" are inappropriate for the IRC. This section doesn't need to match the IPC."

Residential roofs are sometimes occupiable, as is acknowledged by the use of the term "occupiable roof" throughout the IRC. We have adjusted this proposal to utilize the existing term "occupiable roof" in conformance with IRC language, in lieu of matching the IPC language. Since residential roofs may be occupiable, such roofs could be impacted by placement of open vent pipes terminating in close proximity to the occupiable roof. This proposal attempts to minimize this potential for impact without affecting vents which are located far away from the occupiable roof (such as side wall vents, or vents on a non-occupiable portion of the roof).

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The 2024 IRC already requires vent pipes to terminate 7 feet above roofs used for recreational purposes. This proposal merely edits the language for clarity regarding vents which are located far away from the occupiable portion of the roof, and standardizes the terminology with existing terminology used throughout the IRC.

Comment (CAH2)# 421

RP7-24

IRC: TABLE P2903.2

Proposed Change as Submitted

Proponents: Diana Burk, Energy Solutions, Energy Solutions (dburk@energy-solution.com)

2024 International Residential Code

Revise as follows:

TABLE P2903.2 MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS [b]

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY
Lavatory faucet	2.2 gpm at 60 psi
Shower head [a]	~~2.5~~2.0 gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Water closet	1.6 gallons per flushing cycle

For SI: 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. A hand-held shower spray shall be considered to be a shower head. Where a shower compartment is served by multiple shower heads, the concurrent discharge of all shower heads controlled by a single valve shall not exceed the maximum flow rate.

b. Consumption tolerances shall be determined from referenced standards.

Reason: This proposal requires a maximum flow-rate of 2.0 gpm at 80 psi standard for showerheads in residential homes. This requirement is consistent with a similar requirement in the 2024 International Plumbing Code. More stringent standards have been adopted in multiple states including Maine, Hawaii, Washington, Oregon, New York and California. There is wide technological availability and very cost-effective water and energy savings for hot water usage. There is wide technological availability—of the 17,275 showerheads listed in DOE's Compliance Certification Database, 14,146 or 82% meet the 2.0 gpm standard. Plumbing systems in older buildings are not expected to be negatively impacted as the standards allow for only 20% less water to flow (for a 5 minute shower, that would mean 8 gallons of water with a compliant showerhead versus 10 gallons of water for a non-compliant showerhead). For a typical single family home which has roughly 2.2 showerheads, this proposal would save approximately 5,100 gallons of water per year and result in $1,170 in utility cost savings over the 10 year life of the fixture. While this has significant energy and water savings, the incremental impact for a building's plumbing system is negligible.

Bibliography: [1] https://efiling.energy.ca.gov/getdocument.aspx?tn=205654
[2] https://appliance-standards.org/sites/default/files/States%20Go%20First.pdf

[3] https://www.safeplumbing.org/files/safeplumbing.org/documents/misc/7-1-19-WaterSense-2019-Report.pdf

[4] https://appliance-standards.org/sites/default/files/States%20Go%20First.pdf
[5] https://www.eia.gov/consumption/residential/data/2020/#waterheating

[6] https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_3
[7] https://www.eia.gov/dnav/ng/ng_pri_sum_dcu_nus_a.htm
[8] https://www.eia.gov/dnav/pet/pet_pri_wfr_dcus_nus_m.htm

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Estimated Immediate Cost Impact:

In their analysis to establish this standard in 2015, the California Energy Commission found the incremental cost for showerheads is zero because there is no cost premium for a compliant product.[1]

Estimated Immediate Cost Impact Justification (methodology and variables):

In their analysis to establish this standard in 2015, the California Energy Commission found the incremental cost for showerheads is zero because there is no cost premium for a compliant product.[1]

Estimated Life Cycle Cost Impact:

For a typical single family home which has roughly 2.2 showerheads, this proposal would save approximately 5,100 gallons of water per year and result in $1,170 in utility cost savings over the 10 year life of the fixture.

Estimated Life Cycle Cost Impact Justification (methodology and variables):

To estimate the roughly $1,170 in life cycle cost savings, we assumed one showerhead would save 2,247 gallons of water per year resulting in 261 kWh of electricity savings and 13.4 therms/year of savings from a natural gas or oil water heater was made based on savings estimates from the appliance standards awareness program.[2] It was assumed that a typical single family home has roughly 2.2 showerheads.[3] Water and waste water prices were estimated at $11 per thousand gallons and the effective useful life of the showerhead was estimated to be 10 years.[4] It was assumed that 48% of water heaters were natural gas, 46% were electric and 6% were fuel oil based on the 2020 Residential Energy Consumption Survey.[5] Electricity was estimated to cost $0.15/kWh[6], natural gas was estimated at $1.42/therm[7] fuel oil was estimated at $3.06/therm[8] using average annual residential utility prices from the Energy Information Administration.

RP7-24

Public Hearing Results (CAH1)

Committee Action: **Disapproved**

Committee Reason: Shower users will stay in the shower longer, therefore there is no water savings. There is no data to support that there is a water savings. (10-0)

RP7-24

Individual Consideration Agenda

Comment 1:

IRC: TABLE P2903.2

Proponents: Edward R. Osann, Natural Resources Defense Council, Natural Resources Defense Council requests As Modified by Committee (AMC2)

Modify as follows:

2024 International Residential Code

TABLE P2903.2 MAXIMUM FLOW RATES AND CONSUMPTION FOR PLUMBING FIXTURES AND FIXTURE FITTINGS [b]

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATE OR QUANTITY
Lavatory faucet	2.2 gpm at 60 psi
Shower head [a]	~~2.0~~ 2.5 gpm at 80 psi
Sink faucet	2.2 gpm at 60 psi
Water closet	1.6 gallons per flushing cycle

For SI: 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895 kPa.

a. A hand-held shower spray shall be considered to be a shower head. Where a shower compartment is served by multiple shower heads, the concurrent discharge of all shower heads controlled by a single valve shall not exceed the maximum flow rate.

b. Consumption tolerances shall be determined from referenced standards.

Reason: This public comment differs from the proposal as submitted by restoring the code's current maximum flow rate for shower heads of 2.5 gpm, but keeping the addition to the footnote that limits the concurrent flow from all shower heads controlled by a single valve to 2.5 gpm.

In disapproving the proposal as submitted, the committee raised a concern that people would take longer showers when using shower heads with lower maximum flow rates, and thus there would be no savings. However, this public comment removes the concern about lower flow rates entirely. The comment confines the proposal to ensuring that the code's current requirement (as well as similar federal, state, and local requirements) for the maximum flow rate for a shower head (2.5 ppm) is not bypassed with multi-head arrays operating simultaneously through a single valve to produce wasteful flows of 5 gpm or more. As modified by the public comment, this proposal is a common sense clarification to the code.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is a clarification, and imposes no additional costs of construction to achieve compliance.

Comment (CAH2)# 591

RP8-24

IRC: P2905.3

Proposed Change as Submitted

Proponents: Anthony Floyd, City of Scotsdale, City of Scottsdale (afloyd@scottsdaleaz.gov); Edward R. Osann, Natural Resources Defense Council, Natural Resources Defense Council (eosann@nrdc.org)

2024 International Residential Code

Revise as follows:

P2905.3 Hot water supply to fixtures. The *developed length* of *hot water* piping, from the source of the *hot water* to the fixtures that require *hot water*, shall not exceed ~~100 feet (30 480 mm)~~50 feet (15 240 mm) Water heaters and recirculating system piping shall be considered to be sources of hot water.

Reason: This change reduces the length of hot water supply line from the source of hot water to the fixtures unless part of a hot water recirculation system. The 50-foot limit is replicated from IPC Section 607.2. Hot water supply lines greater than 50 feet waste water (proportional to pipe size) while occupants wait for hot water to reach fixtures for bathing, washing and culinary purposes. Even though hot water supply lines are insulated, the hot water remaining in the lines between demand periods cools down. Limiting the length and consequent volume of heated water in the supply lines reduce the amount of wasted water and occupant waiting time.

Bibliography: WaterSense Guide for Efficient Hot Water Delivery Systems -https://www.epa.gov/sites/default/files/2017-01/documents/ws-homes-hot-water-distribution-guide.pdf

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Estimated Immediate Cost Impact:

A hot water pump will be required where the hot water supply line exceeds 50 feet between the water heater and furthest fixture. The immediate cost of a recirculation pump range from $100 to $400 depending on size and control features.

Estimated Immediate Cost Impact Justification (methodology and variables):

Variables include length of hot water supply line between the water heater and the furthest fixture. Approximately 10 to 15 percent of the energy use associated with a hot water delivery system is wasted in distribution losses. The average home wastes more than 3,650 gallons of water per year waiting for hot water to arrive at the point of use. Annual energy and water savings will offset the upfront cost within 5 years.

RP8-24

Public Hearing Results (CAH1)

Committee Action: **Disapproved**

Committee Reason: The cost to install a recirculation pump at the water heater is at least $800-$1000. The cost to the homeowner is greater. The IRC should not match what is in the IPC as the cost impact is unacceptable. There are other options that can be used. (10-0)

RP8-24

Individual Consideration Agenda

Comment 1:

IRC: SECTION 202 (New), P2905.3

Proponents: Edward R. Osann, Natural Resources Defense Council, Natural Resources Defense Council (eosann@nrdc.org); Anthony Floyd, City of Scottsdale, City of Scottsdale (afloyd@scottsdaleaz.gov) requests As Modified by Committee (AMC2)

Replace as follows:

2024 International Residential Code

Add new definition as follows:

PRINCIPAL SHOWER. The shower in a bathroom adjoining the largest bedroom. If no bathroom adjoins the largest bedroom. the shower in the largest bathroom is the principal shower.

Revise as follows:

P2905.3 Hot water supply to fixtures. The developed length of hot water piping, from the source of the hot water to the fixtures that require hot water, other than a principal shower, shall not exceed 100 feet (30 480 mm). The developed length of hot water piping, from the source of the hot water to a principal shower shall not exceed 50 feet (15 240 mm). Water heaters and recirculating system piping shall be considered to be sources of hot water.

Exception: A principal shower incorporated in an addition or repair shall be permitted to be connected to hot water piping with a developed length not greater than 100 feet.

Reason: As revised by this public comment, RP8-24 will be much narrower in scope while still providing substantial value to the home's residents. This comment maintains the code's current limitation on domestic hot water pipe length at 100 feet for all fixtures, except one: the primary shower, where the maximum hot water pipe length is reduced to 50 feet. To avoid ambiguity, a definition is added for "primary shower".

As noted in the proposal as introduced, limiting the length of domestic hot water piping reduces the amount of energy and water that is wasted as cold or tepid water is being purged while waiting for hot water to arrive. These benefits will accrue to residents over the life of the building. Focussing the new 50-foot limitation on the home's single primary shower will capture the lion's share of the benefits of the original proposal, while greatly reducing the likelihood that a hot water recirculation system will be installed. Note also that the 50-foot limit only applies to a primary shower in new construction, as repairs and additions are explicitly excluded. Thus, this requirement can be met at the design stage of a new home without adding hot water recirculation.

The revisions proposed in this public comment are responsive to concerns raised at the first committee hearing, namely that limiting hot water pipe length to 50 feet for all fixtures, including bar sinks, laundry trays, and powder rooms, etc., and all types of projects, including additions, would inevitably require the addition of a costly hot water recirculation system, which adds to costs and energy usage, obviating the cost-saving benefits of reduced energy and water use from the 50-foot limitation. So in response, the comment revises the proposal to limit its application to a primary shower, where purging is a significant and near-daily occurrence, and excludes repairs and additions from triggering the requirement. In this way, a new home's designer can accommodate the 50-foot pipe limit at the design stage, without incurring the cost of a recirculation system.

Available data supports a focus on reducing water purging at the shower. US EPA estimated in 2010 that per capita shower usage was 0.67 showers per day, which can be extrapolated to over 200 million showers nationwide each day. Consistent with this estimate, the Residential End Uses of Water Study 2 (2016) found that in single family homes, there are .66 showers per capita per day, or about 1.8 showers per household per day. Showers and faucets are the two largest uses of hot water. But while showers and faucets were found to use about the same amount of water overall, the share of hot water is higher in showers at 66% compared to faucets at 57%, resulting in higher hot water use for showers (18 gal/household/day) than for faucets (15 gphd). By zeroing in on the primary shower for reduced pipe length, this public comment will capture much of the savings intended by the original proposal without incurring the cost of a hot water recirculation system.

Long wait time for hot water to arrive for showering is a well-know consumer complaint. Without designers' attention to their DHW layouts, larger new homes can easily impose wait times of a minute or more on their new occupants. This can be illustrated by an example of a 100-foot run of copper L piping to a shower. Assuming the piping is 20 feet of 3/4 inch and 80 feet of 1/2 inch, a total of 1.47 gallons is entrained in the pipe run. Purging requires approximately twice this amount to be drawn before hot water for comfortable showering arrives, because after the standing water in the pipe is initially purged, the first draw of hot water from the water heater steadily loses heat until the pipe material itself heats up through its full 100-foot length. In this example, 2.94 gallons of water must be purged, and with a code-minumum showerhead flowing at 2.5 gpm, the resulting wait time is 1 minute and 10 seconds. If a high-efficincy showerhead is present, the wait time will be longer. Unless occupants take back-to-back showers, this waste of time, water, and energy will be repeated for every showring event over the life of the building. This proposal, as modified by this public comment, has the potential to cut such waste nearly in half.

Bibliography: US Environmental Protection Agency, WaterSense Specification for Showerheads Supporting Statement, March 4, 2010. https://www.epa.gov/watersense/product-background-materials#showerhead

US Environmental Protection Agency, WaterSense Guide for Efficient Hot Water Delivery Systems, July 24, 2014. https://www.epa.gov/sites/default/files/2017-01/documents/ws-homes-hot-water-distribution-guide.pdf

DeOreo et al, Residential End Uses of Water Version 2, Water Research Foundation, Report # 4309b, 2016.

IAPMO, Water Efficiency and Sanitation Standard for the Built Environment (WEStand) 2020, Table1003.7.1, Water Volume (oz/ft) For Distribution Piping Materials.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

The code change proposal can be met through design changes without adding to construction costs. Reduced pipe length may result in cost savings for materials and labor.

Estimated Immediate Cost Impact Justification (methodology and variables):

Potential construction cost savings depend on the materials specified for the job.

A reduction of up to 50 feet of pipe length in new construction would reduce material costs by at least the following:

- 50 feet of copper L at $3.52/ft = $176.00
- 50 feet of PEX B at 30c/ft = $15.00

Fewer elbows or other fittings would yield additional savings. Labor savings would be additional.

Source: www.homedepot.com. July 7, 2024.

Comment (CAH2)# 575