

# ACEEE Hot Water Forum

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## The Room-Temperature Lavatory

Photo: Amin Design



**Seattle** Department of  
Construction & Inspections

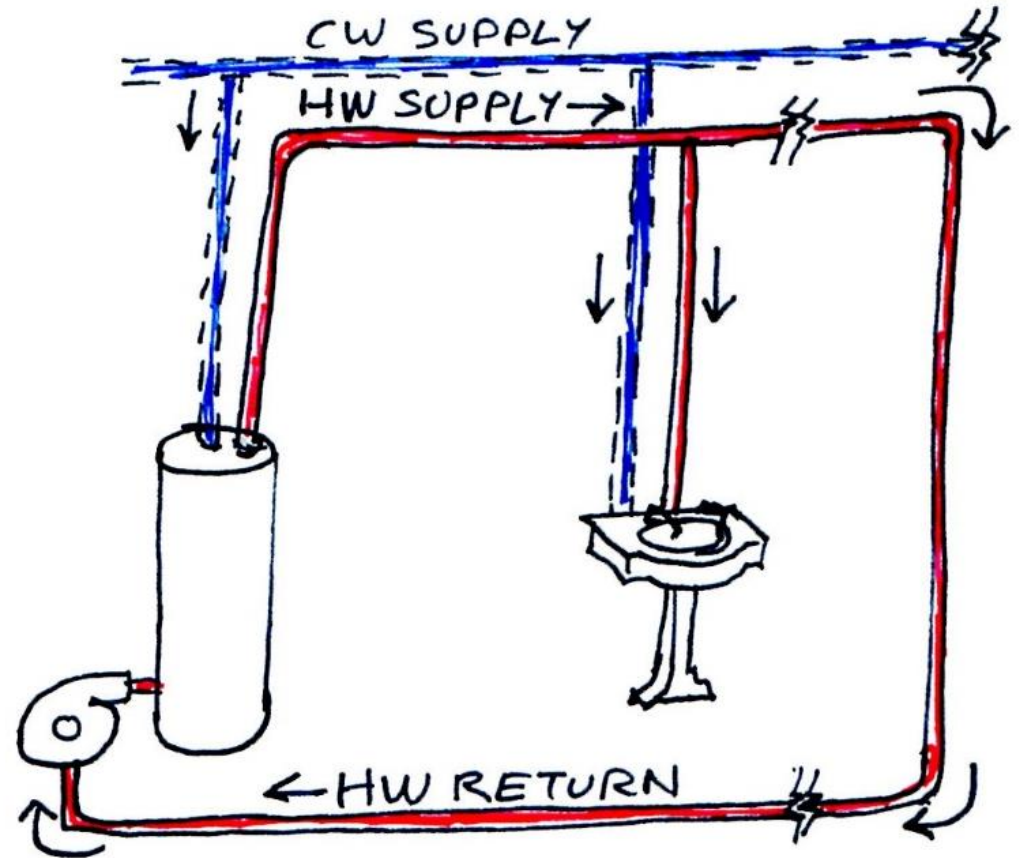
**Duane Jonlin, FAIA**  
March, 2018

# New energy code provision

Limits volume of water between circulating hot water pipe and lavatory

1/2" supply pipe, only 2 feet allowed!

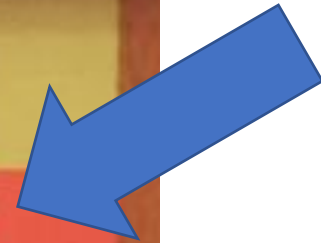
You could also install mini-water heaters at each pair of lavatories



# The Issue

**607.1 Where required.** In residential occupancies, hot water shall be supplied to plumbing fixtures and equipment utilized for bathing, washing, culinary purposes, cleansing, laundry or building maintenance. In nonresidential occupancies, hot water shall be supplied for culinary purposes, cleansing, laundry or building maintenance purposes. **In nonresidential occupancies, hot water or tempered water shall be supplied for bathing and washing purposes.**

Mom says...



# Quiz

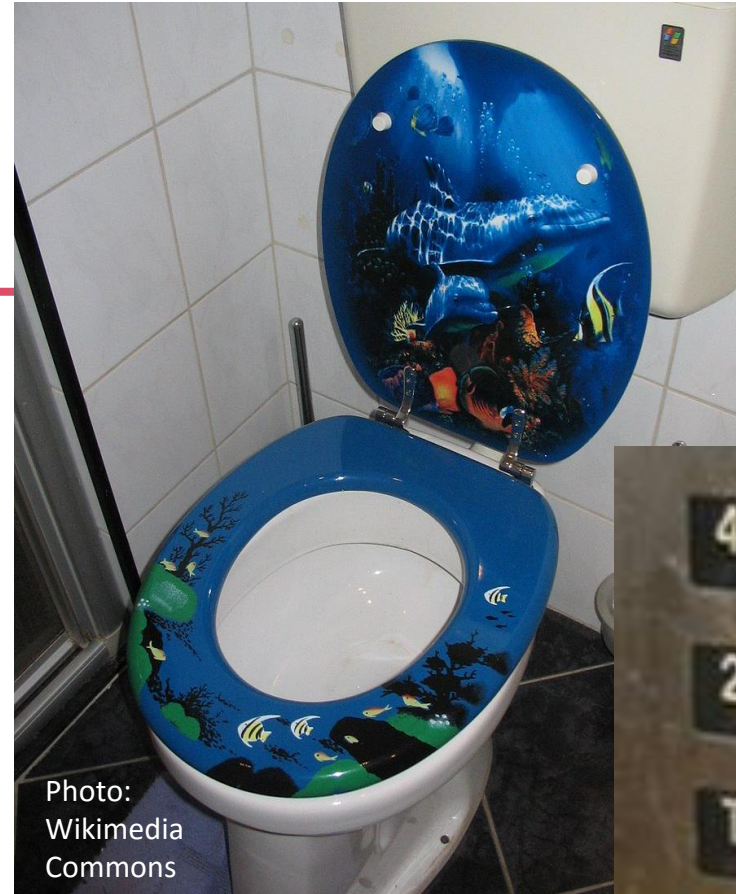
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What's important for handwashing?

- A. Use soap
- B. Scrub for 15 seconds
- C. Use warm water

Which has higher bacteria count?

- A. Toilet seat
- B. Elevator button



# HAI vs. fire in hospitals

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## Hospital-acquired infections in USA

- A. 99,000 annual deaths
- B. 5% of all hospital admissions
- C. \$35,000,000,000 per year

## Hospital *fires* in USA

- A. < 5 annual deaths
- B. 25 injuries
- C. \$25,000,000 property loss



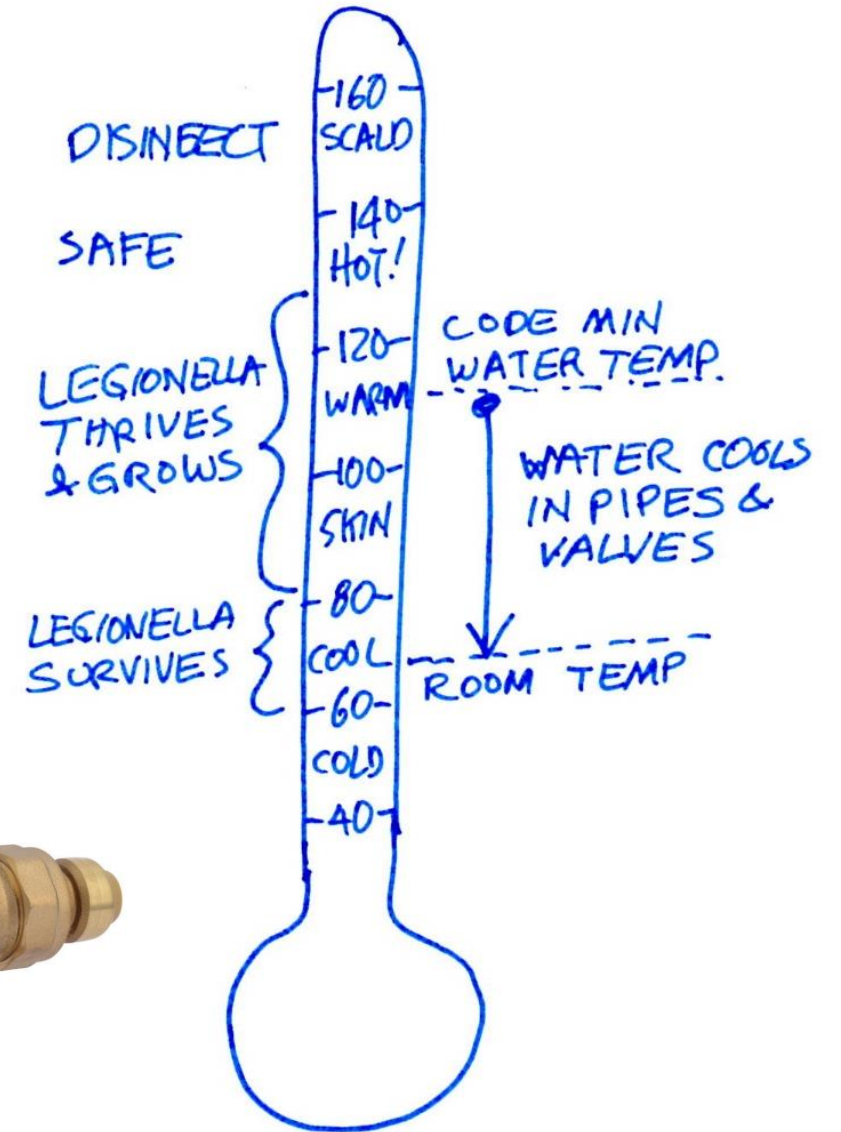
# What Temp is Best?

Were they trying to *encourage* Legionella growth?

Water gradually cools through entire Legionella growth range

Insulation on non-circulating pipes *increases* growth time

Mixing valve is potential incubator



# Safety vs. Comfort

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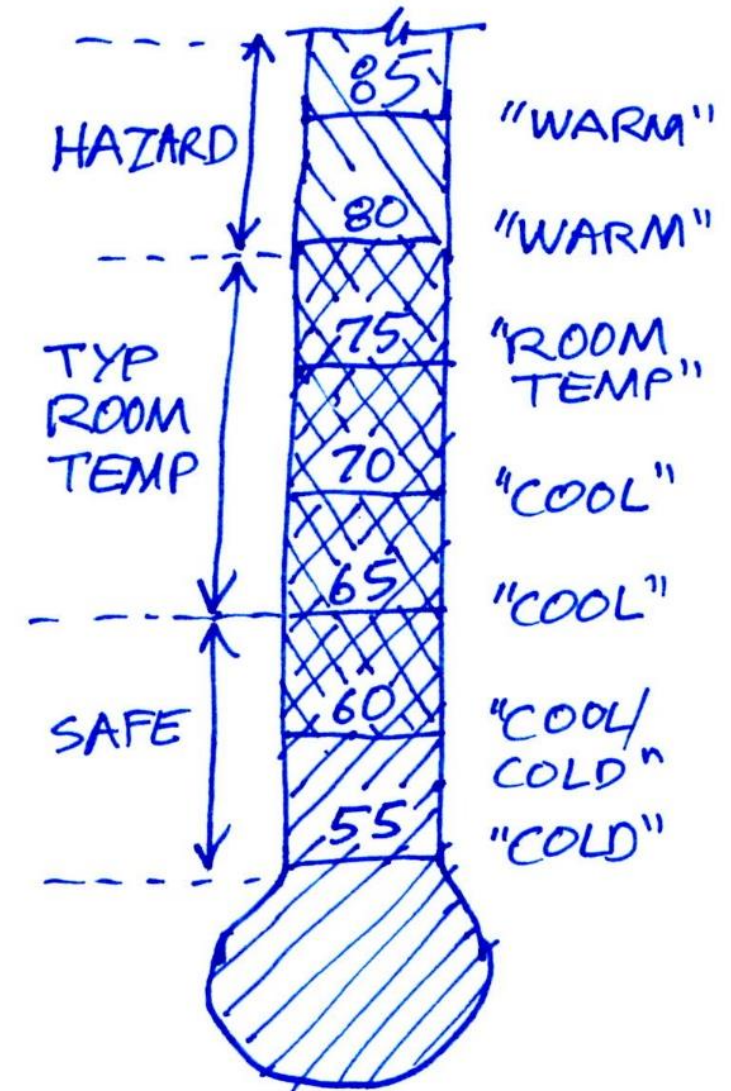
Minimal Legionella growth below 80°

Comfortable handwashing above 60°

Typical room temp range 65° - 78°

Ideal water temp = Standard room temp

Is this perfect or what?





# Costs for hot water lavatories

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Energy cost – heating, pumping, reheating

Operational cost – maintenance, repairs, equipment replacement, leakage?

Construction cost – larger equipment, hot water pipe length, pipe size, pipe insulation, mixing valves, controls

Space cost – space in mechanical rooms, wall cavities, ceiling cavities



# Alternatives

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## Distributed mini-water heaters

- A. Janitor's closets
- B. Break rooms

## Circulating system, just smaller

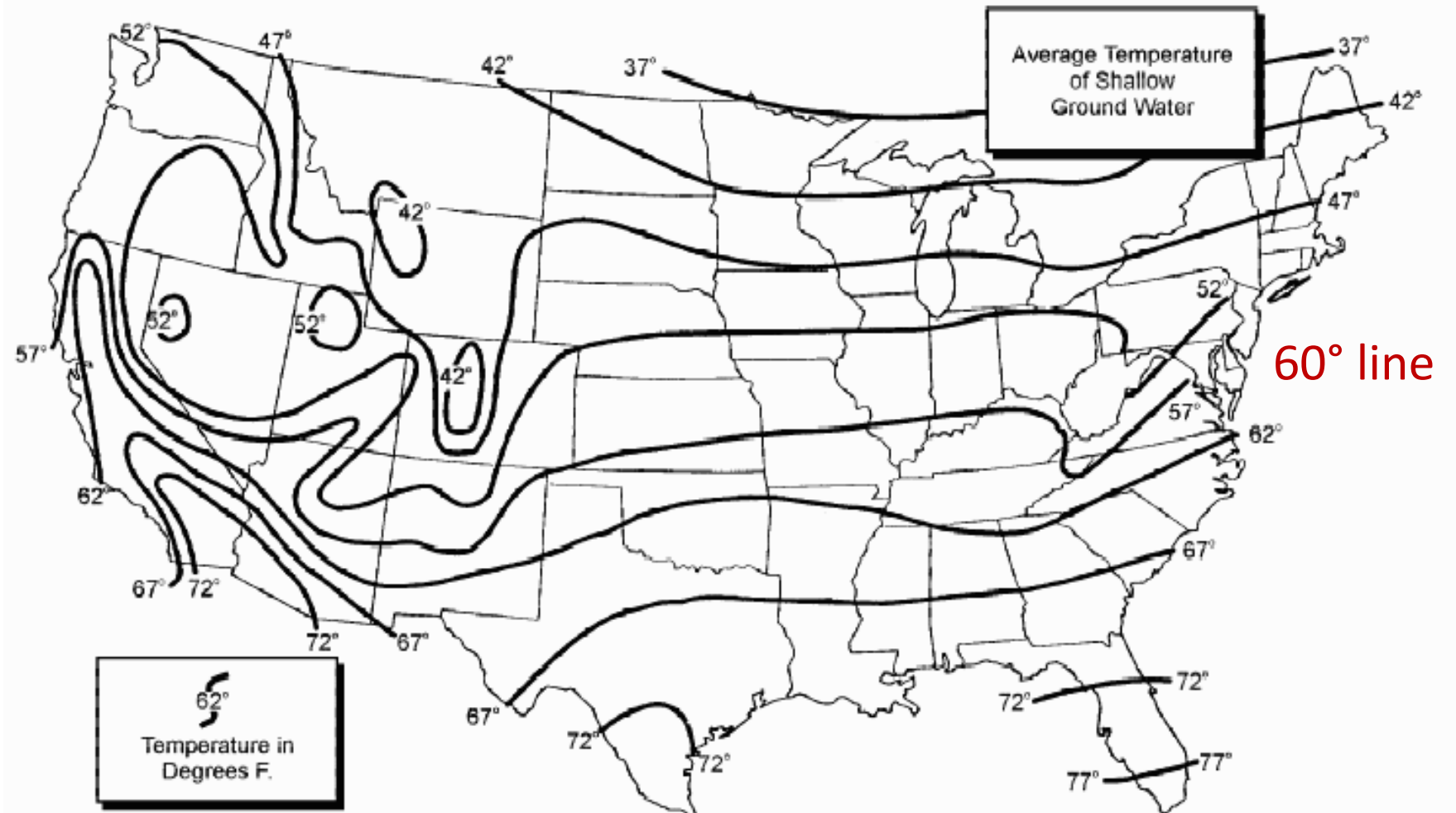
- A. Smaller boiler/water heater
- B. Smaller, shorter circulating pipe
- C. Insulation, mixing valves, controls



# Entering supply water temp

Temperatures can vary +/- 5 degrees winter to summer.

Groundwater temp is proxy for supply water temp



# Heating water to “room temp”

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In South, maybe nothing required

Tempering tank, especially in rooms that need cooling



Drain water heat recovery: effective, no maintenance. Needs clear vertical space

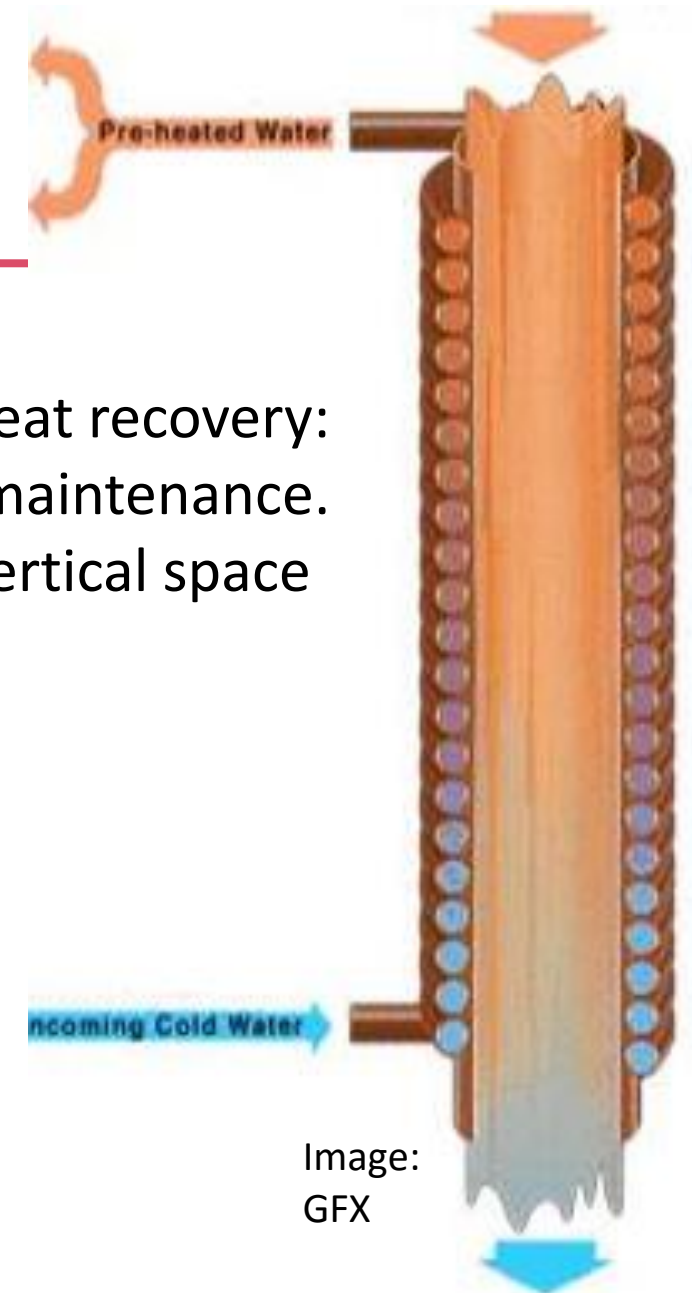


Image:  
GFX

# The Solution?

**607.1 Where required.** In residential *occupancies*, *hot water* shall be supplied to plumbing fixtures and equipment utilized for bathing, washing, culinary purposes, cleansing, laundry or building maintenance. In nonresidential *occupancies*, *hot water* shall be supplied for culinary purposes, cleansing, laundry or building maintenance purposes. In nonresidential *occupancies*, *hot water or tempered water* shall be supplied for bathing and washing purposes.

**Exception:** This section shall not apply to lavatories that do not have separate hot and cold water supply pipes, and that are served by water that either is not heated or is heated by equipment that is incapable of heating water to a temperature above 80° F

# QUESTIONS?

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Duane Jonlin, FAIA

[duane.jonlin@seattle.gov](mailto:duane.jonlin@seattle.gov)

206-233-2781

