



DENVER AMENDMENT PROPOSAL FORM FOR PROPOSALS TO THE 2019 DENVER BUILDING CODE AMENDMENTS AND THE 2021 INTERNATIONAL CODES



2021 CODE DEVELOPMENT CYCLE

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2) One proposal per this document is to be provided with clear and concise information.

Is a separate graphic file provided ("X" to answer): ___ Yes or ___ No

3) Highlight the code and acronym that applies to the proposal

<u>Acronym</u>	<u>Code Name</u>	<u>Acronym</u>	<u>Code Name</u>
DBC-AP	Denver Building Code–Administrative Provisions	IPC	International Plumbing Code
IBC	International Building Code	IRC	International Residential Code
IECC	International Energy Conservation Code	IFGC	International Fuel Gas Code
IEBC	International Existing Building Code	IMC	International Mechanical Code
IFC	International Fire Code	DGC	Denver Green Code

AMENDMENT PROPOSAL

Please provide all the following items in your amendment proposal.

Code Sections/Tables/Figures Proposed for Revision :

C404.7 Drain water heat recovery units

New section in DGC

Proposal:

Revision New Text Delete/Substitute Deletion

Addition to Denver Green Code:

701.4.4.4 (7.4.4.4) Drain water heat recovery. Drain water heat recovery (DWHR) systems shall be installed for all commercial buildings and all IBC group R-2 occupancies on shower facilities. DHWR devices shall be installed on all nonresidential buildings that have four or more showers on a shared drain line. Distributed systems serving multiple floors, central or ganged systems connected to a single or manifold DWHR device, or DWHR devices serving individual shower drains shall meet the requirements of this section. Central DWHR systems for buildings with R-2 occupancies and central water heating systems shall meet the requirements of this section. Central heat pump water heaters that use waste water for heat rejection shall also meet the requirements of this section.

Drain water heat recovery devices shall be installed on a minimum of 80 percent of shower drains.

Commercial buildings with at least forty (50) dwelling units that have at least 5 laundry washer and dryer machines shall have drainwater heat recovery installed on the laundry machines. Laundromat facilities that contain at least ten commercial washer and dryer machines shall include drain water heat recovery on the laundry equipment.

All DWHR systems shall be meet UPC requirements for proper drainage (1/4" per linear foot or as specified by the Plumbing Code). Drain water heat recovery shall be installed on laundry systems in R-2 and commercial buildings that include four or more laundry washing machines.

Vertical DHWR units shall be compliant with CSA B55.2. Sloped DWHR units shall be compliant with UPC 505.4 requirements and testing and labeling requirements of the UPC. In addition, DWHR systems shall meet the following requirements:

a. Have a minimum rated effectiveness of 42 percent, and

b. The drain water heat recovery heat exchanger shall comply with double-wall safety standards for use with potable water systems, per the UPC requirements .

c. The DWHR shall be installed within 1 degree of the rated slope.

Supporting Information:

- **Purpose:**

- The purpose of this proposal is to recover heat loss from service water heating use. This proposal does not address drain water heat recovery for tempering of drain water in excess of 140F for industrial facilities.

- **Reason:**

- Drain water heat recovery is a proven technology that has requirements for installation already incorporated into the IECC. Drain water heat recovery (DWHR) equipment products are readily available in the market. Vertical DWHR products, which comprise 95% of the market, have no moving parts, and can have a service life of 30 to 50 years (2020 Pacific Gas & Electric). This proposal changes the charging language to require the technologies installation through the DGC.

- **Substantiation:** Why is your proposal valid? (i.e. technical justification)

Drain water heat recovery is a proven technology with products available and in use on the market. Pre-heated water can be routed to a storage tank, fixture, or appliance. It is required in some jurisdictions in California and is established code requirement in Canada. This can be especially beneficial in recovering water heating energy in buildings with shower facilities or laundry facilities, including dormitories, assisted living facilities, hotels and motels, and fitness centers.

The drain water heat recovery systems can serve a single fixture or be ganged together to serve multiple devices. DWHR can be piped directly to the device or connected to a central water heater. Multifamily buildings with several stories often have distributed systems where drain water from multiple showers is routed to a central heat recovery device. Typically, the drain water is not routed down to a central water storage tank to avoid long piping runs and the need for booster pumps. Central/ganged DWHR systems typically serve multiple vertical drainage stacks that feed into either a single DWHR device or a manifold of multiple devices. Drainage stacks per plumbing code require a slope of one-quarter inch per linear foot for proper drainage. The DWHR unit is typically located in a ground floor mechanical room.

This code requirement does not specify the type of drain water heat recovery that must be installed. Instead, it allows the designer to specify the type of system most appropriate for the building design.

Drain water heat recovery is also an effective design option for multifamily buildings. For multifamily buildings, recent updates to the 2019 Plumbing Code includes a requirement for metering of individual units. Units must also be designed around fire wall separation between units. For hotel buildings, floor-to-floor height is a design consideration, when accommodating space for DWHR units.

Bibliography and Access to Materials (as needed when substantiating material is associated with the amendment proposal):

2021 California Energy Commission. 2022 Title 24 Building Energy Efficiency Standards, August 2021.

2021 California Energy Commission. 2022 Title 24 Building Energy Efficiency Standards Reference Appendices, August 2021.

2020 Pacific Gas and Electric. Nonresidential Drain Water Heat Recovery, Final Report, September 2020. By Martin, Eric, Energy Solutions on behalf of the Statewide Codes and Standards Enhancement (CASE) Program.

Other Regulations Proposed to be Affected

***For proposals to delete content from the 2019 Denver Green Code in conjunction with adding it to other mandatory Denver codes and/or regulations, only.**

Please identify which other mandatory codes or regulations are suggested to be updated (if any) to accept relocated content.

Referenced Standards:

List any new referenced standards that are proposed to be referenced in the code.

IAPMO IGC 346-2017

Impact:

How will this proposal impact cost and restrictiveness of code? ("X" answer for each item below)

Cost of construction: Increase ___ Decrease ___ No Impact

Cost of design: Increase ___ Decrease ___ No Impact

Restrictiveness: Increase ___ Decrease ___ No Impact