**Code Amendment Proposal Form** For public amendments proposed to the 2018 editions of the International Codes

**Instructions:** Upload this form and all accompanying documentation at www.denvergov.org/BuildingCode. If you are submitting your proposal on a separate sheet, make sure it includes all information requested below.

All proposals must be received by **April 26, 2019**.

**CONTACT INFORMATION**

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**Signature:**

Name: Miles Dake Date: 5/9/2018 Phone: 720-583-4735 E-mail: miles.d@branchpattern.com Organization: BranchPattern

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**AMENDMENT PROPOSAL**

Please use a separate form for each proposal.

1) Code(s) associated with this proposal. Please use acronym: IECC

If you submitted a separate coordination change to another code, please indicate which code:


2) Please check here if a separate graphic file is provided: ☐

*Graphics may also be embedded within your proposal below.*
3) Use this template to submit your proposal or attach a separate file, but please include all items requested below in your proposal. The only formatting needed is **BOLDING**, STRIKEOUT AND UNDERLINING. Please do not provide additional formatting such as tabs, columns, etc., as this will be done by CPD.

**Code Sections/Tables/Figures Proposed for Revision:**

New Section C403.7.1.2 **Note:** If the proposal is for a new section, indicate (new).

**Proposal:**

Add Section as follows: 403.7.1.2 Variable air volume, single zone variable air volume (SZVAV), dedicated outside airflow (DOAS), energy recovery ventilator (ERV) and make up air (MUA) system control Mandatory. Variable air volume, SZVAV, DOAS, ERV and MAU air distribution systems, shall be provided with controls to regulate the flow of outdoor air. Such control system shall be designed to provide fault on excessive outside air, and display or report to BAS and maintain the flow rate of outdoor air, as measured and controlled by an airflow station, at a rate of not less than that required by Section 403.3 of the IMC over the entire range of supply air operating rates. DOAS, ERV and MAU’s shall be required to measure the outside air flow on systems above 4,000 cfm.

**Note:** Show the proposal using strikeout, underline format. At the start of each section, give one of the following instructions:

- Revise as follows:
- Add new text as follows:
- Delete and substitute as follows:
- Delete without substitution:

**Supporting Information:**

**Purpose:** Modify Code so that airflow stations are required to measure outside air to prevent over ventilating and wasting energy.

**Reasons:** Currently Code requires outside airflow measuring stations (OAFMS), for Single Zone VAV and VAV units, however they are not always provided. Measuring, reporting to BAS and being able to set the amount of outside air will save a high percentage of energy as many buildings are improperly ventilated due to damper hysteresis, lack of maintenance and air balancing limitations.

Overventilated buildings waste energy, under ventilated buildings cause higher infiltration, sick days, etc. Clarifying that any unit supplying expensive outside air into a space should be measured so that maintenance adjustments can quickly note over or under ventilation. Having a read out at the equipment or BAS system is important to ensuring the unit is operating correctly.

DOAS, ERV’s and MAU’s over 4,000 cfm should be added to the requirement to measure outside air since DOAS, ERV’s and MAU’s are especially subject to density changes of 21% from a design heating day to a design cooling day. By using an OAFMS on a MAU or DOAS unit will provide 17% less air on a design heating day, drastically reducing over ventilation. As a result of air density change from -5 to 95 deg, buildings with a gas heat MAU or DOAS without energy recovery that operate 5 days a week, 12 hours a day save 7% in heating BTU’s and 17% in fan usage energy and up to 66% in winter demand energy.
by using an airflow measuring station, resulting in less than a 10 year payback. Buildings that operate more often would have a quicker payback.

Also, requiring OAFMS allows for easier testing of building envelope leakage as the OAFMS can typically be used to assist in building leakage testing.

Substantiation: Available on request
Bibliography:

Note: This section MUST include these items:

• Purpose: State the purpose of the proposed amendment to physical, environmental and customary characteristics that are specific to the City and County of Denver (e.g., clarify the code; revise outdated material; substitute new or revised material for physical, environmental and customary characteristics; add new requirements to the code; delete current requirements, etc. to reflect physical, environmental and customary characteristics that are specific to the City and County of Denver)

• Reasons: Clearly justify the change to current code provisions, stating why the proposal is necessary to reflect physical, environmental and customary characteristics that are specific to the City and County of Denver. Proposals that add or delete requirements shall be supported by a logical explanation that clearly shows why the current code does not reflect physical, environmental and customary characteristics that are specific to the City and County of Denver and explains how such proposal will improve the code.

• Substantiation: Substantiate the proposed amendment based on technical information and substantiation. Substantiation provided which is reviewed and determined as not germane to the technical issues addressed in the proposed amendment shall be identified as such.

• Bibliography: Include a bibliography when substantiating material is associated with the amendment proposal. The proponent shall make the substantiating materials available for review.

Referenced Standards:
None

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

Impact:

Above 4,000 cfm for DOAS, ERV’s and MAU’s, the energy savings will reducing carbon emissions (in the 10 – 15% range) with a payback below 10 years.

There should be some cost savings if the building leakage testing requirement goes into effect, as the OAFMS can be used to measure the building leakage in many cases.

Note: Discuss the impact of this proposal in this section AND indicate the impact of this amendment proposal for each of the following:

• The effect of the proposal on the cost of construction: ☒ Increase ☐ Reduce ☐ No Effect
• The effect of the proposal on the cost of design: ☐ Increase ☐ Reduce ☒ No Effect
• Is the proposal more or less restrictive than the I-codes: ☒ More ☐ Less ☐ Same

Departmental Impact: (To be filled out by CPD staff)
Note: CITY STAFF ONLY. Discuss the impact of this proposal in this section AND indicate the impact of this amendment proposal for each of the following:

- The effect of the proposal on the cost of review: ☐ Increase ☐ Reduce ☐ No Effect
- The effect of the proposal on the cost of enforcement/inspection: ☐ Increase ☐ Reduce ☐ No Effect