# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 3

CODE: 2018 International Residential Code w/GA Amendments SECTION: M1402

PROPONENT: Robert Glass DATE: 11/24/2021

EMAIL: Robert.Glass@goodmanmfg.com

ADDRESS: 12680 Lock 15 Road, Tuscaloosa, AL 35406

TELEPHONE NUMBER: (205)759-9638 FAX NUMBER: ( ) -

CHECK ONE: X Revise section to read as follows: ☐ Add new section to read as follows:

☐ Delete section and substitute the following: ☐ Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED:~~ UNDERLINE MATERIAL TO BE ADDED

☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

**Section M1402 Central Furnaces**

**M1402.1 General**

Oil-fired central furnaces shall conform to ANSI/UL 727. Electric furnaces shall conform to UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40.

REASON/INTENT:

Manufacturers are transitioning away from UL 1995 to UL 60335-2-40 for new products because UL 1995 will be obsoleted effective 1/1/2024 (see the attached notification from UL concerning this transition from UL 1995 to UL/CSA 60335-2-40). The newest 3rd edition of UL 60335-2-40, published November 2019, has many new requirements for electrical and refrigerant safety. The 3rd edition includes requirements for UV-C germicidal lamp systems, $CO_2$ systems, photovoltaic systems, new marking requirements, water ingress rating system as well as allowances for Low Global Warming Potential (GWP) Group A2L refrigerants. Certification laboratories will use the latest version of the UL 60335-2-40 safety standard for certification testing. The addition of UL/CSA/ANCE 60335-2-40 was approved by ICC and is printed in the 2021 IRC.

The American Innovation and Manufacturing (AIM) Act of 2020 was signed into law by President Trump. The AIM Act directs EPA to mandate Low GWP refrigerants in air conditioning and refrigeration systems.

The EPA SNAP Rule 23, which lists requirements for the use of noted alternate A2L refrigerants, specifies that air-conditioning equipment using these alternate refrigerants MUST be listed to the 3rd edition of UL 60335-2-40, which is the 2019 edition.

The references to ANCE as a sponsor of this UL/CSA 60335-2-40 standard have been removed as ANCE in Mexico withdrew from the 3rd Edition is no longer associated with this standard after the 2nd Edition. This deletion has been approved by ICC for the 2024 IRC (Group A Item RM6-21).

The normal code cycle for Georgia will not be addressed again until 2025 (using the 2024 ICC codes). Before that date, products using Low GWP, Group A2L refrigerants will be sold to meet market requirements. As such, this proposal needs to be addressed on an off-cycle basis to update the code to make allowance for Low GWP, A2L refrigerant products which will be used.

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FINANCIAL IMPACT OF PROPOSED AMENDMENT:
The code change proposal will not increase or decrease the cost of construction. As a result, there is no impact to cost.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM INSTRUCTION SHEET

1. Do not complete the line entitled "Item No._____".
2. Use a separate form for each proposed code amendment.
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9. **A Statement of Financial Impact must accompany all proposed code amendments.** The statement should be clear and concise. Test reports, standards or other supporting information and documentation may be submitted with the proposed amendment and must be attached to the amendment form.

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11. The proponent will be notified when the proposed amendment will be considered by the State Codes Advisory Committee.

12. Information concerning submittal of code amendments, including deadline dates for submittal, can be obtained by contacting the Codes and Industrialized Buildings Section at (404) 679-3118. All proposed code amendments should be submitted to:

The Department of Community Affairs
Codes and Industrialized Buildings Section
60 Executive Park South, NE
Atlanta, Georgia 30329-2231

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 3

CODE: 2018 International Residential Code w/GA Amendments SECTION: M1403

PROPONENT: Robert Glass DATE: 11/24/2021

EMAIL: Robert.Glass@goodmanmfg.com

ADDRESS: 12680 Lock 15 Road, Tuscaloosa, AL 35406

TELEPHONE NUMBER: (205)759-9638 FAX NUMBER: ( ) -

CHECK ONE:
- X Revise section to read as follows:
- ☐ Add new section to read as follows:
- ☐ Delete section and substitute the following:
- ☐ Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED:~~ UNDERLINE MATERIAL TO BE ADDED

☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

**Section M1403 Heat Pump Equipment**

**M1403.1 Heat pumps**

Electric heat pumps shall be listed and labeled in accordance with UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40.

REASON/INTENT:

The references to ANCE as a sponsor of this UL/CSA 60335-2-40 standard has been removed as ANCE in Mexico withdrew from the 3rd Edition is no longer associated with this standard after the 2nd Edition. This deletion was approved by ICC for the 2024 IRC (Group A Item RM6-21).

The normal code cycle for Georgia will not be addressed again until 2025 (using the 2024 ICC codes). Before that date, products using Low GWP, Group A2L refrigerants will be sold to meet market requirements. As such, this proposal needs to be addressed on an off-cycle basis to update the code to make allowance for Low GWP, A2L refrigerant products which will be used.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:

The code change proposal will not increase or decrease the cost of construction. As a result, there is no impact to cost.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

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Atlanta, Georgia 30329-2231

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 3

CODE: 2018 International Residential Code w/GA Amendments SECTION: M1412

PROPONENT: Robert Glass DATE: 11/24/2021

EMAIL: Robert.Glass@goodmanmfg.com

ADDRESS: 12680 Lock 15 Road, Tuscaloosa, AL 35406

TELEPHONE NUMBER: (205)759-9638 FAX NUMBER: ( ) -

CHECK ONE: X Revise section to read as follows: ☐ Add new section to read as follows:

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☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

**Section M1412 Absorption Cooling Equipment**

**M1412.1 Approval of equipment**

Absorption systems shall be installed in accordance with the manufacturer's instructions. Absorption equipment shall comply with UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40.

REASON/INTENT:

The references to ANCE as a sponsor of this UL/CSA 60335-2-40 standard has been removed as ANCE in Mexico withdrew from the 3rd Edition is no longer associated with this standard after the 2nd Edition. This deletion has been approved by ICC for the 2024 IRC (Group A Item RM6-21).

The normal code cycle for Georgia will not be addressed again until 2025 (using the 2024 ICC codes). Before that date, products using Low GWP, Group A2L refrigerants will be sold to meet market requirements. As such, this proposal needs to be addressed on an off-cycle basis to update the code to make allowance for Low GWP, A2L refrigerant products which will be used.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:

The code change proposal will not increase or decrease the cost of construction. As a result, there is no impact to cost.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

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Atlanta, Georgia 30329-2231

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 3

CODE: 2018 International Residential Code w/GA Amendments SECTION: M1413

PROPONENT: Robert Glass DATE: 11/24/2021

EMAIL: Robert.Glass@goodmanmfg.com

ADDRESS: 12680 Lock 15 Road, Tuscaloosa, AL 35406

TELEPHONE NUMBER: (205)759-9638 FAX NUMBER: ( ) -

CHECK ONE: X Revise section to read as follows: ☐ Add new section to read as follows:

☐ Delete section and substitute the following: ☐ Delete without substitution:

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☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

**Section M1413 Evaporative Cooling Equipment**

**M1413.1 General**

Evaporative cooling equipment and appliances shall comply with UL 1995 or UL/CSA~~/ANCE~~ 60335-2-40 and shall be installed:

REASON/INTENT:

The references to ANCE as a sponsor of this UL/CSA 60335-2-40 standard has been removed as ANCE in Mexico withdrew from the 3rd Edition is no longer associated with this standard after the 2nd Edition. This deletion was approved by ICC for the 2024 IRC (Group A Item RM6-21).

The normal code cycle for Georgia will not be addressed again until 2025 (using the 2024 ICC codes). Before that date, products using Low GWP, Group A2L refrigerants will be sold to meet market requirements. As such, this proposal needs to be addressed on an off-cycle basis to update the code to make allowance for Low GWP, A2L refrigerant products which will be used.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:

The code change proposal will not increase or decrease the cost of construction. As a result, there is no impact to cost.

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# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 3

CODE: 2018 International Residential Code w/GA Amendments SECTION: M2006

PROPONENT: Robert Glass DATE: 11/24/2021

EMAIL: Robert.Glass@goodmanmfg.com

ADDRESS: 12680 Lock 15 Road, Tuscaloosa, AL 35406

TELEPHONE NUMBER: (205)759-9638 FAX NUMBER: ( ) -

CHECK ONE: X Revise section to read as follows: ☐ Add new section to read as follows:

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☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

**Section M2006 Central Furnaces**

**M2006.1 General**

Pool and spa heaters shall be installed in accordance with the manufacturer's installation instructions. Oil-fired pool heaters shall comply with UL 726. Electric pool and spa heaters shall comply with UL 12161. Pool and spa heat pump water heaters shall comply with UL 1995, UL/CSA~~/ANCE~~ 60335-2-40 or CSA C22.2 No. 236.

REASON/INTENT:

Manufacturers are transitioning away from UL 1995 to UL 60335-2-40 for new products because UL 1995 will be obsoleted effective 1/1/2024 (see the attached notification from UL concerning this transition from UL 1995 to UL/CSA 60335-2-40). The newest 3rd edition of UL 60335-2-40, published November 2019, has many new requirements for electrical and refrigerant safety. The 3rd edition includes requirements for UV-C germicidal lamp systems, $CO_2$ systems, photovoltaic systems, new marking requirements, water ingress rating system as well as allowances for Low Global Warming Potential (GWP) Group A2L refrigerants. Certification laboratories will use the latest version of the UL 60335-2-40 safety standard for certification testing. The addition of UL/CSA/ANCE 60335-2-40 was approved by ICC and is printed in the 2021 IRC.

The American Innovation and Manufacturing (AIM) Act of 2020 was signed into law by President Trump. The AIM Act directs EPA to mandate Low GWP refrigerants in air conditioning and refrigeration systems.

The EPA SNAP Rule 23, which lists requirements for the use of noted alternate A2L refrigerants, specifies that air-conditioning equipment using these alternate refrigerants MUST be listed to the 3rd edition of UL 60335-2-40, which is the 2019 edition.

The references to ANCE as a sponsor of this UL/CSA 60335-2-40 standard have been removed as ANCE in Mexico withdrew from the 3rd Edition is no longer associated with this standard after the 2nd Edition. This deletion has been approved by ICC for the 2024 IRC (Group A Item RM6-21).

The normal code cycle for Georgia will not be addressed again until 2025 (using the 2024 ICC codes). Before that date, products using Low GWP, Group A2L refrigerants will be sold to meet market requirements. As such, this proposal needs to be addressed on an off-cycle basis to update the code to make allowance for Low GWP, A2L refrigerant products which will be used.

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# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 4

CODE: 2018 International residential Code w/GA Amendments SECTION: Chapter 44

PROPONENT: Robert Glass DATE: 11/24/2021

EMAIL: Robert.Glass@goodmanmfg.com

ADDRESS: 12680 Lock 15 Road, Tuscaloosa, AL 35406

TELEPHONE NUMBER: (205)759-9638 FAX NUMBER: ( ) -

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[ ] Approve [ ] Approve as amended (DCA STAFF ONLY) [ ] Disapprove [ ] Withdrawn

DESCRIPTION:

| | | |
|---|---|---|
| ~~**ANCE**~~ | | ~~Association of the Electric Sector Av. Lázaro Cardenas No. 869 Col. Nueva Industrial Vallejo C.P. 07700 México D.F.~~ |
| ~~NMX-J-521/2-40-ANCE—2014/ CAN/CSA-22.2 No. 60335-2-40—12/ UL 60335-2-40~~ | ~~Safety of Household and Similar Electric Appliances, Part 2-40: Particular Requirements for Heat Pumps, Air-Conditioners and Dehumidifiers~~ | ~~M1403.1, M1412.1, M1413.1~~ |
| **ASHRAE** | | ASHRAE 1791 Tullie Circle NE Atlanta, GA 30329 |
| 34—~~2016~~ 2019 | Designation and Safety Classification of Refrigerants | M1411.1 |

| | | |
|---|---|---|
| **CSA** | | CSA Group<br>8501 East Pleasant Valley Road<br>Cleveland, OH 44131-5516 |
| ~~CAN/~~CSA~~/~~ C22.2 No. 60335-2-40—~~2012.~~19 | Safety of Household and Similar Electric~~al~~ Appliances, Part 2-40: Particular Requirements for Electric~~al~~ Heat Pumps, Air-Conditioners and Dehumidifiers | M1402.1, M1403.1, M1412.1, M1413.1, M2006.1 |
| **UL** | | UL LLC<br>333 Pfingsten Road<br>Northbrook, IL 60062 |
| 1995—~~2011~~2015 | Heating and Cooling Equipment ~~– with revisions through July 2015~~ | M1402.1, M1403.1, ~~M1407.1,~~ M1412.1, M1413.1, M2006.1 |
| UL~~/CSA/ANCE~~ 60335-2-40—~~2012~~2019 | Standard for Household and Similar Electrical Appliances – Safety -~~,~~ Part 2-40: Particular Requirements for ~~Motor compressors~~ Electrical Heat Pumps, Air-Conditioners and Dehumidifiers | M1402.1, M1403.1, M1412.1, M1413.1, M2006.1 |

REASON/INTENT:

Manufacturers are transitioning away from UL 1995 to UL 60335-2-40 for new products because UL 1995 will be obsoleted effective 1/1/2024 (see the attached notification from UL concerning this transition from UL 1995 to UL/CSA 60335-2-40). The newest 3rd edition of UL 60335-2-40, published November 2019, has many new requirements for electrical and refrigerant safety. The 3rd edition includes requirements for UV-C germicidal lamp systems, $CO_2$ systems, photovoltaic systems, new marking requirements, water ingress rating system as well as allowances for Low Global Warming Potential (GWP) Group A2L refrigerants. Certification laboratories will use the latest version of the UL 60335-2-40 safety standard for certification testing.

The American Innovation and Manufacturing (AIM) Act of 2020 was signed into law by President Trump. The AIM Act directs EPA to mandate Low GWP refrigerants in air conditioning and refrigeration systems.

The EPA SNAP Rule 23, which lists requirements for the use of noted alternate A2L refrigerants, specifies that air-conditioning equipment using these alternate refrigerants MUST be listed to the 3rd edition of UL 60335-2-40, which is the 2019 edition.

The references to ANCE as a sponsor of this UL/CSA 60335-2-40 standard has been removed as ANCE in Mexico withdrew from the 3rd Edition is no longer associated with this standard after the 2nd Edition. This deletion was approved by ICC as part of the 2024 IRC development (Group A Item RM6-21).

ASHRAE 34-2019 includes many new Low GWP refrigerants that do not appear in previous editions of the standard. It should be noted that the 2021 IRC references the 2019 edition of ASHRAE 34.

The titles shown in Chapter 44 – Referenced Standards for UL/CSA 60335-2-40 have been updated to reflect the current title of the standards. The UL/CSA 60335-2-40 is being updated to the 2019 edition. This change was approved by ICC as part of the 2024 code process (Group A Items RM4-21 and RM5-21).

The reference to M1407.1 is being deleted from UL 1995 as M1407.1 addresses Duct Furnaces which comply with UL 1996. The reference to UL 1995 in Chapter 44 is in error. M1407.1 is properly referenced under UL 1996.

UL 1995 is being updated to the current 2015 edition. It should be noted that the 2021 IRC references the 2015 edition of UL 1995.

The normal code cycle for Georgia will not be addressed again until 2025 (using the 2024 ICC codes). Before that date, products using Low GWP, Group A2L refrigerants will be sold to meet market requirements. As such, this proposal needs to be addressed on an off-cycle basis to update the code to make allowance for Low GWP, A2L refrigerant products which will be used.

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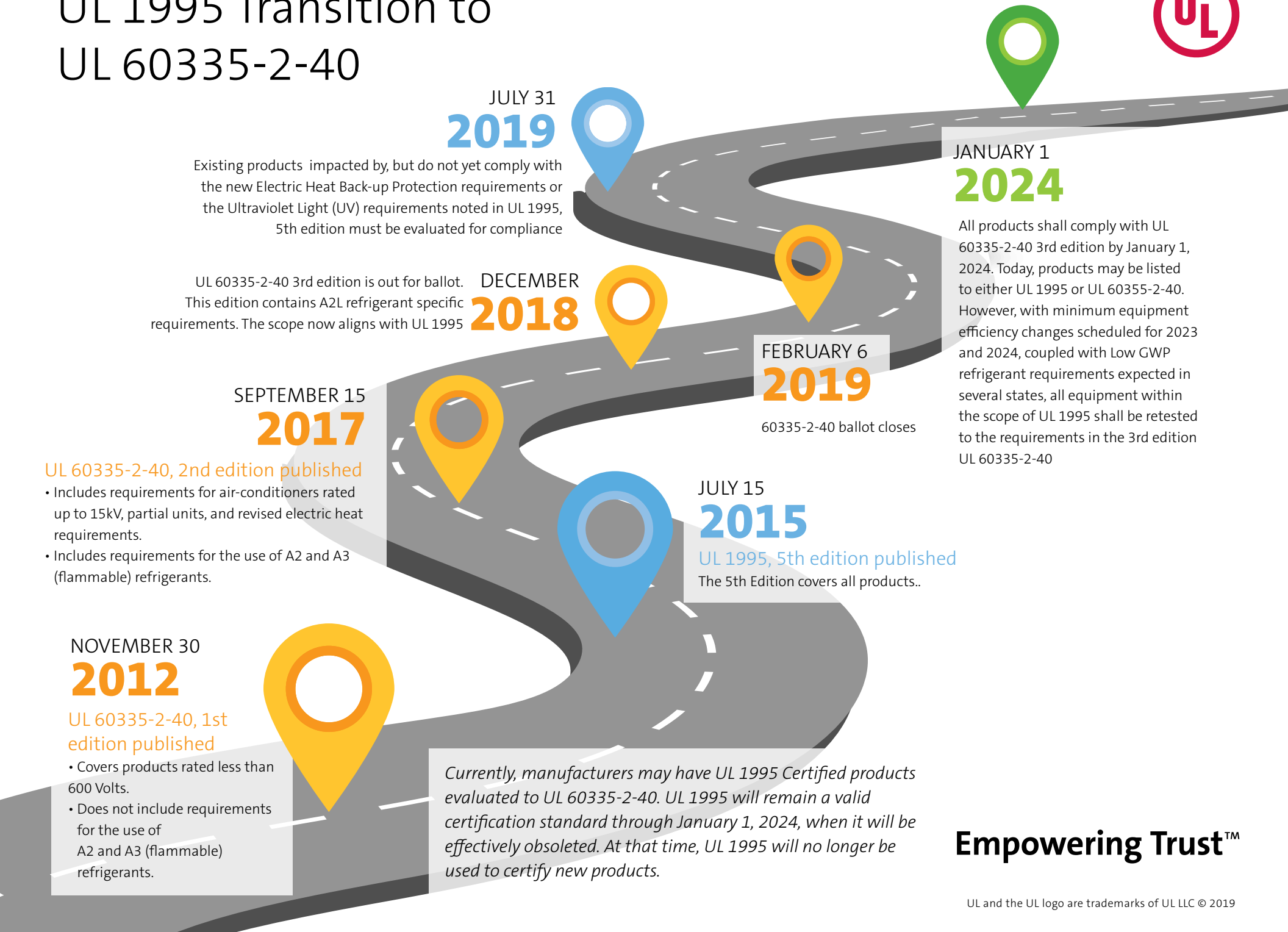
# UL 1995 Transition to UL 60335-2-40



JULY 31
**2019**

Existing products impacted by, but do not yet comply with the new Electric Heat Back-up Protection requirements or the Ultraviolet Light (UV) requirements noted in UL 1995, 5th edition must be evaluated for compliance

JANUARY 1
**2024**

All products shall comply with UL 60335-2-40 3rd edition by January 1, 2024. Today, products may be listed to either UL 1995 or UL 60355-2-40. However, with minimum equipment efficiency changes scheduled for 2023 and 2024, coupled with Low GWP refrigerant requirements expected in several states, all equipment within the scope of UL 1995 shall be retested to the requirements in the 3rd edition UL 60335-2-40

UL 60335-2-40 3rd edition is out for ballot. This edition contains A2L refrigerant specific requirements. The scope now aligns with UL 1995

DECEMBER
**2018**

FEBRUARY 6
**2019**

60335-2-40 ballot closes

SEPTEMBER 15
**2017**

UL 60335-2-40, 2nd edition published

- Includes requirements for air-conditioners rated up to 15kV, partial units, and revised electric heat requirements.
- Includes requirements for the use of A2 and A3 (flammable) refrigerants.

JULY 15
**2015**

UL 1995, 5th edition published

The 5th Edition covers all products..

NOVEMBER 30
**2012**

UL 60335-2-40, 1st edition published

- Covers products rated less than 600 Volts.
- Does not include requirements for the use of A2 and A3 (flammable) refrigerants.

*Currently, manufacturers may have UL 1995 Certified products evaluated to UL 60335-2-40. UL 1995 will remain a valid certification standard through January 1, 2024, when it will be effectively obsoleted. At that time, UL 1995 will no longer be used to certify new products.*

**Empowering Trust™**

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE _____ OF _____

CODE: IECC (Energy Code) SECTION: R202

PROPONENT: Joel Martell DATE: 12/6/2021

EMAIL: jmartell@naima.org

ADDRESS: _____

TELEPHONE NUMBER: (802)779-5469 FAX NUMBER: ( ) -

CHECK ONE:
_____ Revise section to read as follows:
☒ Add new section to read as follows:
☐ Delete section and substitute the following:
☐ Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED:~~ UNDERLINE MATERIAL TO BE ADDED

☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

Add new definition to section R202

Air-Impermeable Insulation: An insulation that functions as an air barrier or an insulation combined with a atomized sealant-based system that functions as an air barrier.

REASON/INTENT:
The intent of this code change is to create a product agnostic code. Section R402.1.2.1 was approved in the spring of 2021 and will be in effect in 2022. This new section allows for a reduction in R-value below the roof deck when using air impermeable insulation. The language above would continue to allow for the new section along with allowing other insulation products to be used in a similar way. The base of this definition was taken from the 2018 IECC.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
This neither increases nor decreases the cost of construction.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

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Codes and Industrialized Buildings Section
60 Executive Park South, NE
Atlanta, Georgia 30329-2231

To the Georgia Department of Community Affairs
60 Executive Park South, NE
Atlanta, GA 30329-2231

Attn Jimmy Reynolds

RE: Proposed code amendment IECC-2023-7
2023 ERB Subcommittee

Dear Mr. Reynolds,

This letter is in opposition to the code change proposal IECC-2023-7
New definition to section R202. Air-Impermeable Insulation.

My opposition rests on two points.

One, air impermeable insulation is already defined in the 2021 ICC IRC. Specifically, it states…

**[RB] AIR-IMPERMEABLE INSULATION.** An insulation having an air permanence equal to or less than 0.02 L/sm$^2$ at 75 Pa pressure differential as tested in accordance with ASTM E283 or E2178.

Two, the new definition does not quantify what air impermeable means, nor does it offer a quantifiable test method that can be used to determine air flow through the material as the existing IRC definition.

For the sake of consistency among the codes the definitions should remain the same.

Respectfully submitted

Robert De Vries
Director of product Support and Development
Nu Wool Co. Inc.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 2

CODE: GA Energy Code SECTION: 402.1.2 & Appendix RA

PROPONENT: Mike Barcik, Southface, Bettie Sleeth & Tim Williams - HBAG DATE: 12/7/2021

EMAIL: mikeb@southface.org; twilliams@americashomeplace.com; bsleeth@hbag.org

ADDRESS: 241 Pine St NE Atlanta GA 30308

TELEPHONE NUMBER: (404) 604-3620 FAX NUMBER: (404) 872-5009

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☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

Add footnote "j" to Table 402.1.2 requiring cantilevered floors over outside air to be insulated to R-30.

Revise Table Header

| Floor *R*-Value[i] |
|---|
| [i] Cantilevered floors over outside air shall be R-30 and the band area above the supporting wall shall be blocked; penetrations of blocking shall be air sealed. |

Add footnote "j" to Table 402.1.4 requiring cantilevered floors over outside air to be maximum U-factor of 0.035.

Revise Table Header

| Floor *U*-Factor[i] |
|---|
| [i] Cantilevered floors over outside air shall be U-0.035 and the band area above the supporting wall shall be blocked; penetrations of blocking shall be air sealed. |

Add sentence to Appendix RA Georgia Insulation Installation – Passing Grade Details (p.45):

**Underfloor insulation** that makes up portions of the building thermal envelope shall be installed to Passing Grade quality.Two criteria affect installed insulation grading: **voids/ gaps** (in which no insulation is present in a portion of the overall insulated surface) and **compression/incomplete fill** (in which the insulation does not fully fill out or extend to the desired depth). Cantilevered floors over outside air shall be R-30 and the band area above the supporting wall shall be blocked; penetrations of blocking shall be air sealed.

REASON/INTENT:

This amendment is intended to restore the code by adding back an inadvertently omitted footnote to Table 402.1.2. This GA prescriptive code footnote has been in place for decades to address a weaker component of the building thermal envelope: insulated floors that are not adjacent to buffered spaces (such as garages and unconditioned crawlspaces and basements) but are instead exposed to outside/ambient air.
The proposal includes also adding the footnote to the prescriptive U-factor table 402.1.4 as well as to the appropriate section of Appendix RA.

---

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
The GA code requirement for R-30 in cantilevered floors has been in place for many years and the majority of builders have been complying with it and continue to do so (only recently has the footnote omission been discovered). The added cost of the upgrade to R-30 is minimal and the effect is to improve an otherwise weak point in the envelope by reducing the heat transfer across the exposed floor, thus saving heating and cooling energy and operating cost.

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# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 3

CODE: GA Energy Code SECTION: IECC R402.4.1.2 (GA Amendments)

PROPONENT: Mike Barcik, Southface, Abe Kruger, SK Collaborative, Diana Burk, New Buildings Institute, Eric Lacey, Responsible Energy Codes Alliance DATE: 12/10/2021

EMAIL: mikeb@southface.org; diana@newbuildings.org; abe@skcollaborative.com; eric@reca-codes.com

ADDRESS: 241 Pine St NE Atlanta GA 30308

TELEPHONE NUMBER: (404) 604-3620 FAX NUMBER: (404) 872-5009

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☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

**R402.4.1.2 Testing.** All one and two-family dwelling units permitted on or after January 1, 2023 shall be tested and verified to less than 4.0 air changes per hour at 50 Pascals (ACH50); all one and two-family dwelling units permitted on or after January 1, 2024 shall be tested and verified to less than 3.0.

Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 or ANSI/RESNET/ICC 380 and reported at a pressure of 0.2 inch w.g. (50 Pascals). A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*. Testing shall be conducted by a *certified duct and envelope tightness (DET) verifier*. (Remainder of section left unchanged)

REASON/INTENT:

This amendment would phase in tighter blower door testing thresholds to bring the code into alignment with the original values of the 2015 IECC.

Currently Georgia's code requires that single family and duplexes must confirm air sealing was properly performed as per code via a blower door test of < 5 ACH50. This amendment allows the construction industry to segue into catching up to the code threshold of < 3 ACH50 over a period of time.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:

Blower door testing of < 5 ACH50 is currently required on 1&2 family dwellings. This amendment would simply require the testing threshold to reduce over time and eventually align with the original 2015 IECC values. There is no additional testing cost associated with this reduced passing threshold. Since the industry is currently absorbing the cost of testing, and assuming code required air sealing is properly performed, there is no cost increase.

Having a tighter testing threshold means Georgia no longer has a weakened code requirement. Air sealing and testing remains one of the most cost-effective ways to save energy. The significant benefits of this amendment include lower energy bills and reduced risk of moisture failure and comfort problems.

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# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 3

CODE: GA Energy Code SECTION: IECC C402.5 & ASHRAE 90.1 C401.2

PROPONENT: Mike Barcik, Southface, Abe Kruger, SK Collaborative, Diana Burk, New Buildings Institute, Eric Lacey, Responsible Energy Codes Alliance DATE: 12/10/2021

EMAIL: mikeb@southface.org; diana@newbuildings.org; abe@skcollaborative.com; eric@reca-codes.com

ADDRESS: 241 Pine St NE Atlanta GA 30308

TELEPHONE NUMBER: (404) 604-3620 FAX NUMBER: (404) 872-5009

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DESCRIPTION:

Amend this section of 2015 IECC (similar language applies to ASHRAE 90.1-2013):

**C402.5 Air leakage—thermal envelope (Mandatory).** The *thermal envelope* of buildings not classified as type R-2 shall comply with Sections C402.5.1 through C402.5.8, or the building *thermal envelope* shall be tested in accordance with ASTM E 779 at a pressure differential of 0.3 inch water gauge (75 Pa) or an equivalent method approved by the code official and deemed to comply with the provisions of this section when the tested air leakage rate of the building thermal envelope is not greater than 0.40 cfm/ft$_2$ (0.2 L/s · m$_2$). Where compliance is based on such testing, the building shall also comply with Sections C402.5.5, C402.5.6 and C402.5.7.

Add new section of 2015 IECC (similar also applies to ASHRAE 90.1-2013):

**C402.5 Air leakage—thermal envelope for Mid-rise multifamily (Mandatory).** The *thermal envelope* of buildings shall comply with Sections C402.5-MF and C402.5.1-MF

**C402.5-MF multifamily dwelling testing (Mandatory)**. All commercial type R-2 multifamily dwellings (regardless of number of stories of dwelling units) shall be tested to less than 5.0 air changes per hour at 50 Pascals (ACH50).

As an alternative to ACH50, compliance for commercial type R-2 dwellings may be attained by achieving an Envelope Leakage Ratio at 50 Pascals (ELR50) of less than 0.30 (ELR50 < 0.30, where ELR50 = CFM50 / Envelope Shell Area, in square feet).

*Add a new Section C402.5.1MF 'Low-rise multifamily testing protocol (Optional)' to read as follows:

**C402.5.1-MF multifamily testing protocol (Optional).** Commercial type R-2 multifamily dwellings (regardless of number of stories of dwelling units) may (optionally) employ either one or both of the following testing protocols:

1. Utilize multiple fans in adjacent units (commonly referred to as Guarded Blower Door testing) to minimize effect of leakage to adjacent units (not required).
2. Envelope testing of less than 100 percent shall be acceptable assuming a maximum sampling protocol of 1 in 4 dwelling units per floor (if sampled unit passes, the remaining up to three units are deemed to comply; if sampled unit fails, it must be sealed and retested and the remaining up to three units shall also be tested).

Amend this section of ASHRAE 90.1-2013 (same requirement as IECC 2015):
C401.2 Application
Commercial buildings shall comply with one of the following:
1. The requirements of ANSI/ASHRAE/IESNA 90.1 and Section C402.5 (air leakage testing for mid-rise multifamily dwellings)

---

REASON/INTENT:
This amendment would require blower door testing to confirm air sealing was properly performed as per code requirements on all mid-rise multifamily (type R-2) construction. Currently, this testing is required for low-rise multifamily construction; this amendment would mimic that testing requirement for all commercial multifamily units regardless of height.

---

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
Blower door testing is currently required on low-rise multifamily buildings. This amendment would continue that requirement for taller multifamily projects. Since the industry is currently absorbing the cost on low-rise developments and since 1 in 4 sampling is permitted, the added cost per dwelling unit is relatively small.

The significant benefits of this additional testing include energy savings and reduced risk of moisture failure and comfort problems.

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# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 3

CODE: GA Energy Code SECTION: IECC R402.4.1.3 (GA Amendments)

PROPONENT: Mike Barcik, Southface, Abe Kruger, SK Collaborative, Diana Burk, New Buildings Institute, Eric Lacey, Responsible Energy Codes Alliance DATE: 12/10/2021

EMAIL: mikeb@southface.org; diana@newbuildings.org; abe@skcollaborative.com; eric@reca-codes.com

ADDRESS: 241 Pine St NE Atlanta GA 30308

TELEPHONE NUMBER: (404) 604-3620 FAX NUMBER: (404) 872-5009

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DESCRIPTION:

**R402.4.1.3 Low-rise R-2 multifamily testing (Mandatory).** Low-rise R-2 multifamily dwellings shall be tested to less than 5.0 air changes per hour at 50 Pascals (ACH50).
As an alternative to ACH50, compliance for Low-rise R-2 dwellings may be attained by achieving an Envelope Leakage Ratio at 50 Pascals (ELR50) of less than 0.30 (ELR50 < 0. 30, where ELR50 = CFM50 / Envelope Shell Area, in square feet).

**R402.4.1.3.1 Low-rise multifamily testing protocol (Optional).** Where a residential building is classified as R-2, envelope testing may (optionally) employ either one or both of the following testing protocols:
1. Utilize multiple fans in adjacent units (commonly referred to as Guarded Blower Door testing) to minimize effect of leakage to adjacent units (not required).
2. Envelope testing of less than 100 percent shall be acceptable assuming a maximum sampling protocol of 1 in 4 units per floor (if sampled unit passes, the remaining up to three units are deemed to comply; if sampled unit fails, it must be sealed and retested and the remaining up to three units shall also be tested).

REASON/INTENT:

This amendment would lower the blower door testing threshold from < 7 ACH50 to < 5.0 ACH50. Currently in Georgia, single family and duplexes must confirm air sealing was properly performed as per code via a blower door test of < 5 ACH50. This amendment brings low-rise multifamily construction into alignment with current residential construction and still allows optional compliance with an ELR50 approach.

---

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
Blower door testing is currently required on low-rise multifamily buildings. This amendment would simply require those testing thresholds align with the current GA 2020 thresholds for 1&2 family homes. There is no additional testing cost associated with this reduced passing threshold. Since the industry is currently absorbing the cost on low-rise developments and since 1 in 4 sampling is permitted, the added cost per dwelling unit is minimal.

The significant benefits of this testing include further energy savings and reduced risk of moisture failure and comfort problems.

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# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 3

CODE: GA Energy Code SECTION: IECC C402.5 & ASHRAE 90.1 C401.2

PROPONENT: Mike Barcik, Southface, Abe Kruger, SK Collaborative, Diana Burk, New Buildings Institute, Eric Lacey, Responsible Energy Codes Alliance DATE: 12/10/2021

EMAIL: mikeb@southface.org; diana@newbuildings.org; abe@skcollaborative.com; eric@reca-codes.com

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DESCRIPTION:

Amend section C402.5 of 2015 IECC (similar applies to ASHRAE 90.1-2013):

**C402.5 Air leakage—thermal envelope (Mandatory).** The *thermal envelope* of buildings 25,000 s.f. and greater shall comply with Sections C402.5.1 through C402.5.8, or the building *thermal envelope* shall be tested in accordance with ASTM E 779 at a pressure differential of 0.3 inch water gauge (75 Pa) or an equivalent method approved by the code official and deemed to comply with the provisions of this section when the tested air leakage rate of the building thermal envelope is not greater than 0.40 cfm/ft$_2$ (0.2 L/s · m$_2$). Where compliance is based on such testing, the building shall also comply with Sections C402.5.5, C402.5.6 and C402.5.7.

Add new section of 2015 IECC (similar applies to ASHRAE 90.1-2013):

**C402.5-LC Air leakage—thermal envelope for Light Commercial buildings under 25,000 sf. (Mandatory).** The *thermal envelope* of buildings under 25,000 s.f. not classified as type R-2 shall be tested in accordance with ASTM E 779 at a pressure differential of 0.3 inch water gauge (75 Pa) or an equivalent method approved by the code official and deemed to comply with the provisions of this section when the tested air leakage rate of the building thermal envelope is not greater than 0.40 cfm/ft$_2$ (0.2 L/s · m$_2$). Where compliance is based on such testing, the building shall also comply with Sections C402.5.5, C402.5.6 and C402.5.7.

Amend this section to ASHRAE 90.1-2013 (same requirements for projects using 90.1):

C401.2 Application

Commercial buildings shall comply with one of the following:

1. The requirements of ANSI/ASHRAE/IESNA 90.1 and Section C402.5-LC (air leakage testing for Light Commercial buildings under 25,000 s.f.)

REASON/INTENT:

This amendment would require blower door testing to confirm air sealing was properly performed as per code requirements on all non-residential commercial buildings under 25,000 s.f.

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FINANCIAL IMPACT OF PROPOSED AMENDMENT:
For a 2-story, 25,000 s.f (100'x125' with 12' walls) commercial building, the Envelope Shell area would be as follows:

Ground floor slab area: 12.500 s.f.
Second floor flat ceiling area: 12,500 s.f.
Exterior wall areas: (100+125+100+125)x24 = 10,800 s.f.

Total Envelope Shell area: 35,800 s.f. Taking 40% of Shell Area = 14,320
Thus, approximately 14,320 cfm75 is maximum amount of leakage allowed to pass code.
This would require the use of approximately three blower door fans and a 3-fan setup is a typical commercial building testing rig. It could also be tested with three individual blower doors in three openings.
There is a cost associated with this test – preparation and equipment set up, conducting the test, equipment break down. Estimate 2 people, half-day time, approximately $1,000. Smaller commercial buildings would more closely resemble a house and would be substantially less time and equipment intensive.

The significant energy savings and reduced risk of moisture failure and comfort problems easily justify the added cost of this test.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM INSTRUCTION SHEET

1. Do not complete the line entitled "Item No._____".
2. Use a separate form for each proposed code amendment.
3. "Sheet ____ of _____" indicates the number of sheets for each individual proposed code amendment, not the number of sheets for all the amendments submitted.
4. Identify the code and code section that is the subject of the proposed amendment.
5. The proponent's name, address, telephone number and fax number must be filled out completely.
6. Be sure to indicate the type of recommended action in the space referred to as "Check One".
7. If the proposed amendment revises the language of the code section, deletes the entire code section, or deletes the entire code section and offers substitute language, include the language of the present code section and line through the language to be deleted and underline the language of the proposed amendment.
8. Under the "Reason" section, provide the reasoning behind the proposed code amendment. The reason should be clear and concise. Test reports, standards or other supporting information and documentation may be submitted with the proposed amendment and must be attached to the amendment form.
9. **A Statement of Financial Impact must accompany all proposed code amendments.** The statement should be clear and concise. Test reports, standards or other supporting information and documentation may be submitted with the proposed amendment and must be attached to the amendment form.

10. **All proposed amendments must be typed and completed in full and the original submitted to the Codes and Industrialized Buildings Section of the Department of Community Affairs NO LATER THAN DECEMBER 15TH.** The proposed code change shall be submitted for review to the State Codes Advisory Committee at their quarterly meeting in January. An incomplete form will be sent back to the proponent for completion. An amendment submitted after the submittal deadline date will be returned to the proponent.

11. The proponent will be notified when the proposed amendment will be considered by the State Codes Advisory Committee.

12. Information concerning submittal of code amendments, including deadline dates for submittal, can be obtained by contacting the Codes and Industrialized Buildings Section at (404) 679-3118. All proposed code amendments should be submitted to:

The Department of Community Affairs
Codes and Industrialized Buildings Section
60 Executive Park South, NE
Atlanta, Georgia 30329-2231

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 5

CODE: IRC SECTION: 806

PROPONENT: Shawn Mullins on behalf of Owens Corning DATE: 12/13/21

EMAIL: shawn.mullins@owenscorning.com

ADDRESS: 9538 W Patrick Lane, Peoria, AZ 85383

TELEPHONE NUMBER: (623)695-5694 FAX NUMBER: (480)500-6158

CHECK ONE:
☐ Revise section to read as follows:
☒ Add new section to read as follows:
☐ Delete section and substitute the following:
☐ Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED.~~ UNDERLINE MATERIAL TO BE ADDED

☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:
See text below and NOTE – this proposal submitted via email to Jim Reynolds: jim.reynolds@dca.ga.gov

REASON/INTENT:
See reason statement below

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
None

# PROPOSED SUPPLEMENTAL LANGUAGE TO THE 2018 GEORGIA INTERNATIONAL RESIDENTIAL CODE BUILDING CODE

## CHAPTER 8 ROOF-CEILING CONSTRUCTION

## SECTION R806

## ROOF VENTILATION

**R806.1 Ventilation required.**

Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow.

Ventilation openings shall have a least dimension of / inch (1.6 mm) minimum and / inch (6.4 mm) maximum.

Ventilation openings having a least dimension larger than / inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material with openings having a least dimension of / inch (1.6 mm) minimum and / inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of Section R802.7. Required ventilation openings shall open directly to the outside air and shall be protected to prevent the entry of birds, rodents, snakes and other similar creatures.

**R806.2 Minimum vent area.**

The minimum net free ventilating area shall be / of the area of the vented space.

Exception: The minimum net free ventilation area shall be / of the vented space provided both of the following conditions are met:

1. In Climate Zones 6, 7 and 8, a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.

2. Not less than 40 percent and not more than 50 percent of the required ventilating area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located not more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically. The balance of the required ventilation provided shall be located in the bottom one-third of the attic space. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet (914 mm) below the ridge or highest point of the space shall be permitted.

**R806.3 Vent and insulation clearance.**

Where eave or cornice vents are installed, blocking, bridging and insulation shall not block the free flow of air. Not less than a 1-inch (25 mm) space shall be provided between the insulation and the roof sheathing and at the location of the vent.

**R806.4 Installation and weather protection.**

Ventilators shall be installed in accordance with manufacturer's instructions. Installation of ventilators in roof systems shall be in accordance with the requirements of Section R903. Installation of ventilators in wall systems shall be in accordance with the requirements of Section R703.1.

**R806.5 Unvented attic and unvented enclosed rafter assemblies**

5. 2 In Climate Zones 1,2 and 3, air-permeable insulation installed in unvented *attics* shall meet the following requirements.

5.2.1 An approved vapor *diffusion port* shall be installed not more than 12 inches (305 mm) from the highest point of the roof, measured vertically from the highest point of the roof to the lower edge of the port.
5.2.2. The port area shall be greater than or equal to 1:150 of the ceiling area. Where there are multiple ports in the attic, the sum of the port areas shall be greater than or equal to the area requirements.
5.2.3 The vapor-permeable membrane in the *vapor diffusion port* shall have a vapor permeance rating of great than or equal to 20 perms when tested in accordance with Procedure A of ASTM E96.
5.2.4 The *vapor diffusion port* shall serve as an air barrier between the *attic* and the exterior of the building.
5.2.5. The *vapor diffusion port* shall protect the *attic* against the entrance of rain or snow.
5.2.6 Framing members and blocking shall not block the free flow of water vapor to the port. Not less than a 2-inch (51 mm) space shall be provided between any blocking and the roof sheathing. Air-permeable insulation shall be permitted within that space.
5.2.7 The roof slope shall be greater than or equal to 3:12 (vertical/horizontal)
5.2.8 Where only air-permeable insulation is used, it shall be installed directly below the structural roof sheathing.
5.2.9 *Air-impermeable insulation,* if any, shall be directly above or below the structural roof sheathing and is not required to meet the R-value in Table 806.5. Where directly below the structural roof sheathing, there shall be no space between the *air-impermeable insulation* and air-permeable insulation.
5.2.10 The air shall be supplied to a flow rate greater than or equal to 50 CFM (23.6 L/s) per 1,000 square feet (93 $m^2$) of ceiling. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating. Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating.

## Reason Statement:

The 2018 IRC introduced unvented attics and unvented enclosed rafter assemblies using only air permeable insulation as an acceptable construction method as long as certain criteria and guidelines are followed. One of the key guidelines in using air permeable insulation in an unvented attic is the addition of a vapor diffusion port, this port constructability is similar to the addition of a ridge vent in traditional roof assemblies. This system has been studied, researched and vetted for many years and has been proven to be successful.
Advantages:

- **Airtightness.** a house that has a conditioned unvented attic can be significantly more airtight than houses without it thus making it more energy efficient. Even though the model code has requirements for duct tightness levels the ductwork and air handlers are often leaky. Often the ductwork and/or the air handlers are located in the attic, if the attic is conditioned the leaks will not have a big energy penalty, if the attic is unconditioned and vented the leaks from these systems can result in a pressure difference causing more infiltration into the home. Figure 1, below outlines this issue.

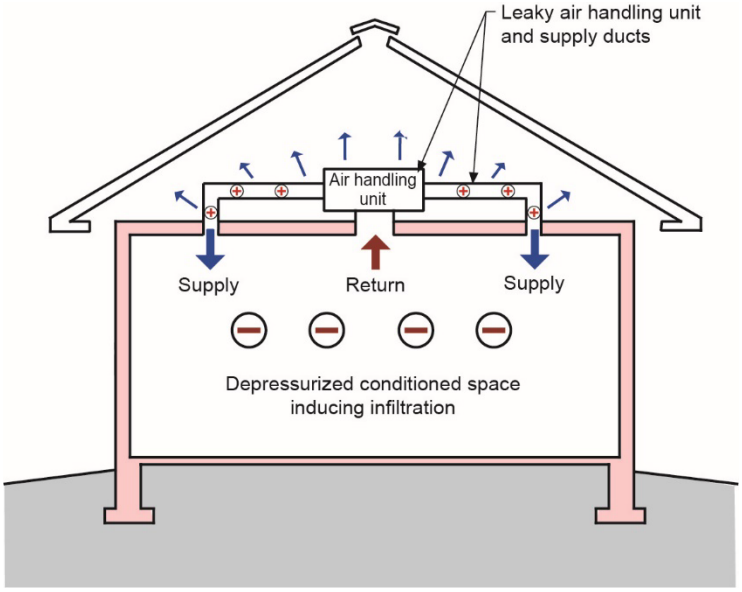



Figure 1. (Lstiburek, J.W.)

- **Fire Protection.** Unvented attics can provide other benefits as well including helping to reduce the spread of fires. This is particularly true for areas where buildings are close to one another, typically fires start in neighboring buildings due to debris getting sucked into the house via attics vents, if there are no vents it can significantly reduce the fire risk.
- **Wind Uplift.** Other benefits come in areas of the country where there is a high wind potential, mostly the coastal areas. High wind events can cause the soffit vents to breakdown and create significant uplift on the roof assemblies which can cause damage to the roof assembly and rest of the dwelling.
- **Moisture Control in Humid Climates.** The traditional way of thinking is that vented attics help to alleviate moisture issues and this may be true in certain climate zones. In a hot humid climate having a vented attic will cause moisture problems, it will bring the hot humid air from outside the home into the attic which causes ductwork to sweat which in turn can cause moisture and mold growth on sheathing and framing. The alternative is unvented attics, these attics have shown to have some moisture concerns as well near the ridge, however, the introduction of vapor diffusion ports has shown to significantly reduce the moisture build up in these area to help to alleviate moisture build up. The difference in moisture is shown below.

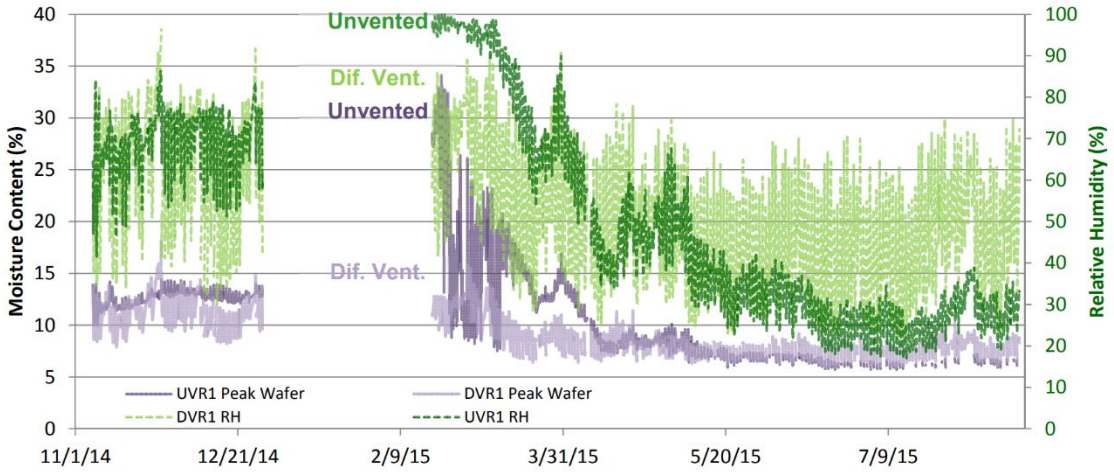



Figure 2. (Ueno, K and Lstiburek, J.W)

- **Cost Effectiveness.** *Description on how using air-permeable insulation to construct a home with a conditioned attic is a low cost pathway for builders*

References:


1. Lstiburek, J.W.; Venting vapor, ASHRAE Journal, July 2015.
2. Ueno, K and Lstiburek, J.W.; Building America Report: Field testing of an unvented roof with fibrous insulation, tiles, and vapor diffusion venting, Building Science Corporation, November 2015.


Regards,


**Shawn Mullins**
Sr. Sales Lead: Technical Sales & Government Affairs
North American Building Insulation | Sales
**M:** 623-695-5694
shawn.mullins@owenscorning.com

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 5

CODE: IRC SECTION: 806

PROPONENT: Shawn Mullins on behalf of Owens Corning DATE: 12/13/21

EMAIL: shawn.mullins@owenscorning.com

ADDRESS: 9538 W Patrick Lane, Peoria, AZ 85383

TELEPHONE NUMBER: (623)695-5694 FAX NUMBER: (480)500-6158

CHECK ONE:
☐ Revise section to read as follows:
☒ Add new section to read as follows:
☐ Delete section and substitute the following:
☐ Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED.~~ UNDERLINE MATERIAL TO BE ADDED

☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:
See text below and NOTE – this proposal submitted via email to Jim Reynolds: jim.reynolds@dca.ga.gov

REASON/INTENT:
See reason statement below

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
None

# PROPOSED SUPPLEMENTAL LANGUAGE TO THE 2018 GEORGIA INTERNATIONAL RESIDENTIAL CODE BUILDING CODE

## CHAPTER 8 ROOF-CEILING CONSTRUCTION

## SECTION R806

## ROOF VENTILATION

**R806.1 Ventilation required.**

Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow.

Ventilation openings shall have a least dimension of / inch (1.6 mm) minimum and / inch (6.4 mm) maximum.

Ventilation openings having a least dimension larger than / inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material with openings having a least dimension of / inch (1.6 mm) minimum and / inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of Section R802.7. Required ventilation openings shall open directly to the outside air and shall be protected to prevent the entry of birds, rodents, snakes and other similar creatures.

**R806.2 Minimum vent area.**

The minimum net free ventilating area shall be / of the area of the vented space.

Exception: The minimum net free ventilation area shall be / of the vented space provided both of the following conditions are met:

1. In Climate Zones 6, 7 and 8, a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.
2. Not less than 40 percent and not more than 50 percent of the required ventilating area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located not more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically. The balance of the required ventilation provided shall be located in the bottom one-third of the attic space. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet (914 mm) below the ridge or highest point of the space shall be permitted.

**R806.3 Vent and insulation clearance.**

Where eave or cornice vents are installed, blocking, bridging and insulation shall not block the free flow of air. Not less than a 1-inch (25 mm) space shall be provided between the insulation and the roof sheathing and at the location of the vent.

**R806.4 Installation and weather protection.**

Ventilators shall be installed in accordance with manufacturer's instructions. Installation of ventilators in roof systems shall be in accordance with the requirements of Section R903. Installation of ventilators in wall systems shall be in accordance with the requirements of Section R703.1.

**R806.5 Unvented attic, sealed attic and unvented enclosed rafter assemblies**

R806.5 Unvented attics with insulation and thermal boundary located at the roof deck

1. The unvented attic space is completely within the building thermal envelope.
2. Interior Class I vapor retarders are not installed on the ceiling side (attic floor) of the unvented attic assembly.
3. Where wood shingles or shakes are used, a minimum / -inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. Air-impermeable insulation
4.1. In Climate Zones 5, 6, 7 and 8, any air-impermeable insulation shall be a Class II vapor retarder or, shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.
4.2. The air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing and shall be in accordance with the R-values in Table R806.5 for condensation control
4.3. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45°F (7°C). For calculation purposes, an interior air temperature of 68°F (20°C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months.
5. Air-permeable Insulation
5.1 Air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing, except that it shall also be in accordance with the R-values in Table R806.5 for condensation control, and thus include a layer of air-impermeable insulation where required by Table R806.5..
5.2 Positively pressured air shall be supplied to the attic space at a flow rate greater than or equal to 50 CFM (23.6 L/s) per 1,000 square feet (93 m ) of ceiling. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating. Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating
6. Combination of air-impermeable and air-permeable insulation
6.1. Where both air-impermeable and air-permeable insulation are provided, the air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing and shall be in accordance with the R-values in Table R806.5 for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.
6.2. Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer
6.3. Positively pressured air shall be supplied to the attic space at a flow rate greater than or equal to 50 CFM (23.6 L/s) per 1,000 square feet (93 m ) of ceiling. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating. Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating

R806.6 Sealed attic with diffusion ports with air-permeable insulation and thermal boundary located at the ceiling
1. The unvented attic space is completely within the building thermal envelope.
2. In Climate Zones 1, 2 and 3, air-permeable insulation installed in sealed attics shall meet the following requirements:
2.1 An approved vapor diffusion port shall be installed not more than 12 inches (305 mm) from the highest point of the roof, measured vertically from the highest point of the roof to the lower edge of the port.
2.2 The port area shall be greater than or equal to 1:150 of the ceiling area. Where there are multiple ports in the attic, the sum of the port areas shall be greater than or equal to the area requirement.
2.3 The vapor-permeable membrane in the vapor diffusion port shall have a vapor permeance rating of greater than or equal to 20 perms when tested in accordance with Procedure A of ASTM E96.
2.4 The vapor diffusion port shall serve as an air barrier between the attic and the exterior of the building.
2.5 The vapor diffusion port shall protect the attic against the entrance of rain and snow.
2.6 Framing members and blocking shall not block the free flow of water vapor to the port. Not less than a 2-inch (51 mm) space shall be provided between any blocking and the roof sheathing. Air-permeable insulation shall be permitted within that space.

2.7 Positively pressured air to the attic space is not required in this assembly.

R806.7 Enclosed Rafter Spaces
Enclosed roof framing assemblies created by ceilings that are applied directly to the underside of the roof framing members and structural roof sheathing applied directly to the top of the roof framing members/rafters, shall adhere to the following:
1. Interior Class I vapor retarders are not installed on the ceiling side of the unvented enclosed roof framing assembly.
2. Where wood shingles or shakes are used, a minimum / -inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing underlayment above the structural sheathing
3. Enclosed rafter spaces shall comply with Sections R806.1, R806.2 and R806.3 of this Code.

## Reason Statement:

The 2018 IRC introduced unvented attics and unvented enclosed rafter assemblies using only air permeable insulation as an acceptable construction method as long as certain criteria and guidelines are followed. One of the key guidelines in using air permeable insulation in an unvented attic is the addition of a vapor diffusion port, this port constructability is similar to the addition of a ridge vent in traditional roof assemblies. This system has been studied, researched and vetted for many years and has been proven to be successful. This language carries over existing IRC language and further breaks it into more manageable and understandable sections, based on assembly type(s) and thermal boundary location. The expectation is that by doing so the intent of this code can be more easily understood and executed. Additionally, the intention here is to reformat existing base IRC model code language into more manageable and understandable sections, based on assembly type(s) and thermal boundary location. The expectation is that by doing so the intent of this code can be more easily understood and executed.
Advantages:

- **Airtightness.** a house that has a conditioned unvented attic can be significantly more airtight than houses without it thus making it more energy efficient. Even though the model code has requirements for duct tightness levels the ductwork and air handlers are often leaky. Often the ductwork and/or the air handlers are located in the attic, if the attic is conditioned the leaks will not have a big energy penalty, if the attic is unconditioned and vented the leaks from these systems can result in a pressure difference causing more infiltration into the home. Figure 1, below outlines this issue.

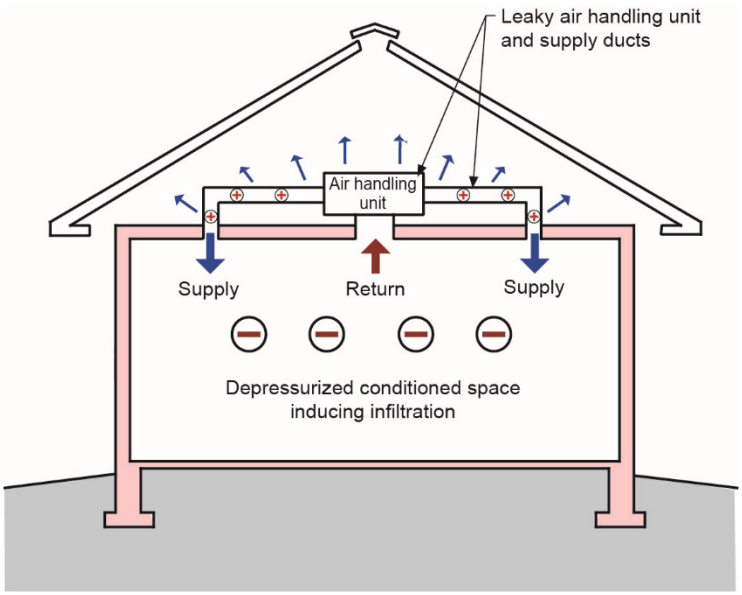



Figure 1. (Lstiburek, J.W.)

- **Fire Protection.** Unvented attics can provide other benefits as well including helping to reduce the spread of fires. This is particularly true for areas where buildings are close to one another, typically fires start in neighboring buildings due to debris getting sucked into the house via attics vents, if there are no vents it can significantly reduce the fire risk.
- **Wind Uplift.** Other benefits come in areas of the country where there is a high wind potential, mostly the coastal areas. High wind events can cause the soffit vents to breakdown and create significant uplift on the roof assemblies which can cause damage to the roof assembly and rest of the dwelling.
- **Moisture Control in Humid Climates.** The traditional way of thinking is that vented attics help to alleviate moisture issues and this may be true in certain climate zones. In a hot humid climate having a vented attic will cause moisture problems, it will bring the hot humid air from outside the home into the attic which causes ductwork to sweat which in turn can cause moisture and mold growth on sheathing and framing. The alternative is unvented attics, these attics have shown to have some moisture concerns as well near the ridge, however, the introduction of vapor diffusion ports has shown to significantly reduce the moisture build up in these area to help to alleviate moisture build up. The difference in moisture is shown below.

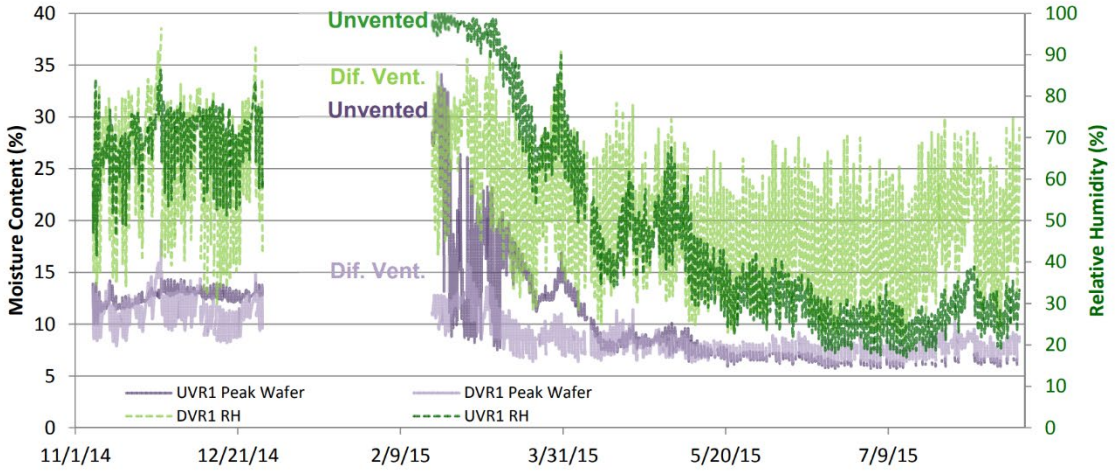



Figure 2. (Ueno, K and Lstiburek, J.W)

- **Cost Effectiveness.** *Description on how using air-permeable insulation to construct a home with a conditioned attic is a low cost pathway for builders*

References:


1. Lstiburek, J.W.; Venting vapor, ASHRAE Journal, July 2015.
2. Ueno, K and Lstiburek, J.W.; Building America Report: Field testing of an unvented roof with fibrous insulation, tiles, and vapor diffusion venting, Building Science Corporation, November 2015.



Regards,
**Shawn Mullins**
Sr. Sales Lead: Technical Sales & Government Affairs
North American Building Insulation | Sales
**M:** 623-695-5694
shawn.mullins@owenscorning.com

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 2

CODE: International Building Code 2018 SECTION: 1511.1 – Exception 2

PROPONENT: Christian N. Dawkins, P.E. DATE: 12/9/2021

EMAIL: chris.dawkins@beechconsulting.com

ADDRESS: Suite 401A, 3883 Rogers Bridge Road, Duluth, GA 30097

TELEPHONE NUMBER: 770-476-2362 FAX NUMBER: 770-476-1047

CHECK ONE: [X] Revise section to read as follows: [ ] Add new section to read as follows:
[ ] Delete section and substitute the following: [ ] Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED:~~ UNDERLINE MATERIAL TO BE ADDED

[ ] Approve [ ] Approve as amended (DCA STAFF ONLY) [ ] Disapprove [ ] Withdrawn

DESCRIPTION:

**1511.1 General.**

Materials and methods of application for recovering or replacing an existing *roof covering* shall comply with the requirements of Chapter 15.

**Exceptions:**

1. *Roof replacement* or *roof recover* of existing low-slope *roof coverings* shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide *positive roof drainage*.
2. Recovering or replacing an existing *roof covering* shall not be required to meet the requirement for secondary (emergency overflow) drains or scuppers in Section 1502.2 for roofs that provide for *positive roof drainage*, and have been determined to resist all design loads. For the purposes of this exception, existing secondary drainage or *scupper systems* required in accordance with this code shall not be removed unless they are replaced by secondary drains or *scuppers* designed and installed in accordance with Section 1502.2.

REASON/INTENT:

This amended language is necessary to ensure public life-safety and to clarify specifically when Exception 2 is applicable and to prevent roof collapses/structural overload failures from: a) uncontrolled ponding, incidental to new dead-loads imposed onto existing roof structures during re-roof projects; b) inadequate or missing secondary drainage assemblies at existing roofs that should have such secondary/emergency overflow drainage, as required by earlier adopted building codes; and/or c) alteration of drainage assemblies during re-roofing projects.

This amended language is also needed to ensure preservation of physical assets and/or operations that are covered by existing roofs, subject to re-roofing.

REASON/INTENT (continued):
If during a low-slope re-roofing project, an owner discovers that their as-presently-constructed roof has defective or missing code-required emergency overflow/secondary drainage assemblies, the existing roof was likely not building code-compliant at the time of its installation and, until properly remediated, remains a threat/danger to public life-safety from catastrophic collapse.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
Most buildings that will be re-roofed already meet IBC requirements, and there will be no increased costs resulting from the proposed additional language. Most residential and multi-family buildings' roofs (typically steep-slope) and commercial buildings with roofs that drain over the edge and buildings with rigid structures will not be affected. The cost of adding parapet wall emergency through-wall scuppers or other secondary drainage measures at low-slope roofs that require such assemblies, should have been borne at the time of the existing low-slope roof's original construction, based on requirements of earlier adopted building codes.

If found to missing, parapet wall through-wall scuppers or other secondary drainage measures are typically of nominal cost to retrofit into existing buildings/roofs. The costs to add or modify an emergency overflow drainage system varies. In many cases, all that is required is to add overflow drains or scuppers to control the volume of water that would accumulate on the roof. Overflow scupper costs vary from $500 to $1,500 depending on their complexity and overflow drains vary from $1,500 to $3,000.

There will be increased costs to buildings with flexible structural elements that are susceptible to ponding instability, which leads to roof structure overloading and catastrophic roof collapse. These buildings would fall into the "Dangerous Condition" category, as defined in IEBC Section 302.2 (however, since the IEBC is a permissive code in Georgia, this issue needs to be fully discussed in the mandatory IBC). For these "Dangerous Condition" buildings, additional cost would involve a structural engineering evaluation to determine that the building structure with new, added dead-loading is safe and additionally, that the new dead-loading will not alter the function of in-place secondary drainage systems. In most cases, it is presumed that structural engineering evaluation would be the extent of the additional costs, since building structures are typically designed with sufficient margin-of-safety factors.

In cases where a structural engineering evaluation indicates a building/roof structure is unsafe, there would be additional costs to strengthen, supplement, replace or otherwise alter the structure, as required to carry the additional loads. These costs would vary from building-to-building depending upon the extent of the discovered issues.

Regardless, the costs to evaluate and/or modify a structure that has been found to be unsafe from additional loading caused by re-roofing or from inadequate or missing secondary drainage systems, is necessary to protect public life-safety and property/operations below existing roofs.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 9

CODE: International Building Code 2018 SECTION: 1511.1 – Exception 1

PROPONENT: Christian N. Dawkins, P.E. DATE: 12/9/2021

EMAIL: chris.dawkins@beechconsulting.com

ADDRESS: Suite 401A, 3883 Rogers Bridge Road, Duluth, GA 30097

TELEPHONE NUMBER: 770-476-2362 FAX NUMBER: 770-476-1047

CHECK ONE: [X] Revise section to read as follows: [ ] Add new section to read as follows:

[ ] Delete section and substitute the following: [ ] Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED:~~ UNDERLINE MATERIAL TO BE ADDED

[ ] Approve [ ] Approve as amended (DCA STAFF ONLY) [ ] Disapprove [ ] Withdrawn

DESCRIPTION:

**1511.1 General.**

Materials and methods of application for recovering or replacing an existing *roof covering* shall comply with the requirements of Chapter 15.

**Exceptions:**

1. *Roof replacement* or *roof recover* of existing low-slope *roof coverings* shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide *positive roof drainage* and meet the requirements of Section 1608.3 and Section 1611.2.
2. Recovering or replacing an existing *roof covering* shall not be required to meet the requirement for secondary (emergency overflow) drains or scuppers in Section 1502.2 for roofs that provide for *positive roof drainage*. For the purposes of this exception, existing secondary drainage or *scupper systems* required in accordance with this code shall not be removed unless they are replaced by secondary drains or *scuppers* designed and installed in accordance with Section 1502.2.

REASON/INTENT:

This additional language is necessary to ensure public life-safety and to emphasize the IBC requirement that susceptible bays be analyzed for ponding instability during structural design/loads analyses that are required incidental to the recovering or replacement of existing *roof coverings* that add new dead-loads to existing roof structures. As the IBC has evolved through periodic updates, there have been fundamental changes in its requirements related to roof drainage, structural requirements for ponding instability, and, with climate change, significant increases in design rain loads (both rainfall intensity and duration). Annually, re-roofing projects comprise about three-quarters of U.S. low-sloped roofing projects.

REASON/INTENT (continued):
This additional language is needed to reduce the likelihood of catastrophic roof collapses that that occur from uncontrolled ponding and/or inadequate drainage that is directly related to new dead-loads imposed onto existing roof structures from re-roofing.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
Most buildings that will be reroofed already meet IBC requirements, and there will be no increased costs resulting from the proposed additional language. Most residential and multi-family buildings' roofs (typically steep-slope) and commercial buildings with roofs that drain over the edge and buildings with rigid structures will not be affected.

There will be increased costs to buildings with flexible structural elements that are susceptible to ponding instability, which leads to roof structure overloading and catastrophic roof collapse. These buildings would fall into the "Dangerous Condition" category, as defined in IEBC Section 302.2 (however, since the IEBC is a permissive code in Georgia, this issue needs to be fully discussed in the mandatory IBC). For these "Dangerous Condition" buildings, additional cost would involve a structural engineering evaluation to determine that the building structure with new, added dead-loading is safe. In most cases, it is presumed that structural engineering evaluation would be the extent of the additional costs, since building structures are typically designed with sufficient margin-of-safety factors.

In cases where a structural engineering evaluation indicates a building/roof structure is unsafe, there would be additional costs to strengthen, supplement, replace or otherwise alter the structure, as required to carry the additional loads. These costs would vary from building-to-building depending upon the extent of the discovered issues. In most cases, overflow drains or scuppers could be added or resized to limit the amount of water that would accumulate on the new roof. Overflow scupper costs vary from $500 to $1,500 depending on their complexity and overflow drains vary from $1,500 to $3,000.

Regardless, the costs to evaluate and/or modify a structure that has been found to be unsafe from additional loading caused by re-roofing, is necessary to protect public life-safety.

**Additional Detailed Discussions Supporting the "REASON/INTENT" Section Above**:
The following dialogue and case studies, prepared by the Codes and Standards Committee of the International Institute of Building Enclosure Consultants (IIBEC), further support, in much greater detail, justification for the proposed additional language to Exception 1.

**Fundamental Changes Related to Drainage**
A 2012 study, titled "Flow Rate Through Roof Drains" (see Ref. 1), published by the American Society of Plumbing Engineers (ASPE) and the International Association of Plumbing and Mechanical Officials concluded: "The research produced stunning results that verified that the sizing method for storm drainage systems, as required in the plumbing codes, is inaccurate." In summary, the roof drains design criteria the engineering/construction industry has been using for more than 70 years is flawed. Drainage assemblies' flow rates are based on the head of water over the drains and their geometry.

FLOW RATE THROUGH ROOF DRAINS

by Julius Ballanco, PE, CPD, FASPE

The American Society of Plumbing Engineers Research Foundation conducted research on the flow rates through various manufacturers' roof drains. The research produced stunning results that verified that the sizing method for storm drainage systems, as required in the plumbing codes, is inaccurate. A new approach to sizing storm drainage systems was developed based on the research test results.

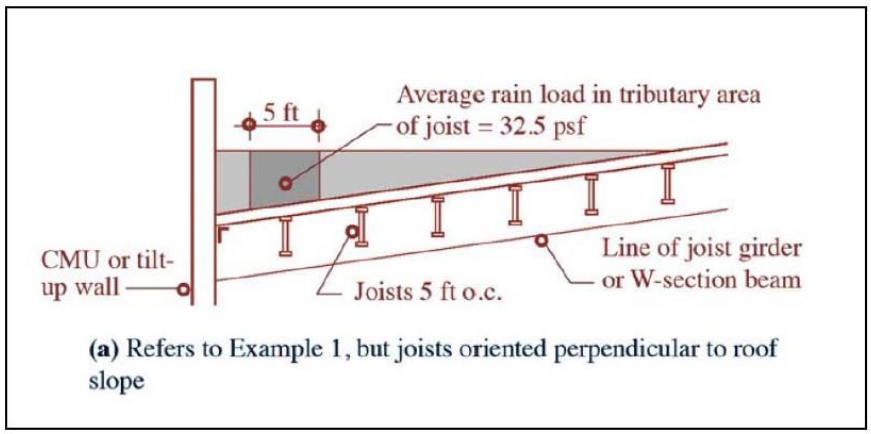
This research led to significant changes to the *IPC*. As of 2015, the *IPC* no longer publishes flow rates through drains. The *IPC* requires the designer to use "the published roof drain flow rate" for drainage design. The problem is that, at the time of this writing, there is only one drain manufacturer that publishes flow rates for their roof drains. The only published data on flow through drains is *FM Global Property Loss Prevention Data Sheets 1-54: Roof Loads for New Construction*, which essentially addresses only one type of drain. As a result of these code changes, the IIBEC/RCI Foundation recently published the book titled *Roof Drainage* (Second Edition, 2021) (see Ref. 2), which provides an in-depth explanation of the new drainage design criteria and a guide for roof drainage designers. Accordingly, roof drainage systems that were designed per plumbing code requirement prior to IPC 2015 should be re-evaluated as part of roof recovering or replacement over an existing *roof covering*.

**Structural Requirements for Ponding Instability**
The second major change to codes involves structural requirements for ponding instability. Currently Section 1512.1, Exception 1 allows slopes less than ¼ inch per foot for re-roofing projects. By definition, (IBC Section 202), a *susceptible bay* is "a roof or portion thereof with a slope less than ¼ inch per foot." Sections 1608.3 and 1611.2 require that *susceptible b*ays be evaluated for ponding instability in accordance with Chapters 7 and 8 of ASCE 7. This proposed change allows a slope of less than ¼ inch per foot only if the roof is not susceptible to ponding instability.

ASCE 7-16 significantly revised its "Chapter 8: Rain Loads." Historically, ASCE and the model codes have required ponding instability to be investigated when a roof slope is less than 1/4 inch per foot. Ponding instability is a serious life-safety and structural issue for roofs. We have also learned that ponding instability is not just an issue on roofs with slopes less than 1/4-inch per foot, but can also an issue on many more roof configurations. In other words, the potential for roof collapse resulting from ponding instability is significant, and many roofs constructed before the 2016 design standards were adopted, have never been analyzed for ponding instability.

The most significant change in the evaluation of ponding instability addressed in ASCE 7-16 is structural orientation. The load on the joists is much greater if the joists are oriented parallel to the wall to which the water drains than if the joists are perpendicular to the wall. Below is example of a collapse in Dallas, TX, where ponding instability and structural orientation was an issue. The accumulation of water on the 1st and 2nd joists that were parallel to the wall was much greater than if the joists had been perpendicular to the wall. This condition resulted in excessive rainwater load on the joists. The photograph below, left shows the roof collapse, and the photograph below, right shows the joists' structural orientation.

Below is an excerpt from "Roof Drainage Design, Roof Collapses, and the Code" (Patterson and Mehta, 2018) (see Ref. 4) that illustrates rainwater load distribution on a roof with joists running parallel to the drainage wall. In many cases these joists were designed using a live-load of 16 psf, so the rainwater live-load is double the design live-load.




**(a)** Refers to Example 1, but joists oriented perpendicular to roof slope

In a paper by Coffman and Williamson (2019) (see Ref. 7), they discuss that ponding can occur due to differences between "design slope" found in IBC, Chapter 15 and "roof slope" used in ASCE 7. Their concluding recommendation is: "When design constraints necessitate a 1/4 inch per 12 design slope be used, the framing members should be cambered or investigated for ponding."

**Increases in Design Rain Loads**

*ASCE 7-16* also recognized another important roof drainage design issue in "Section 8.2 Roof Drainage." There have been two rainfall rates used for the design of secondary drainage systems. Currently, the *IPC* requires a 1-hour, 100-year rainfall rate for designing the secondary drainage system, while the *National Standard Plumbing Code* requires a 15-minute, 100-year rainfall rate for designing the secondary drainage system. The original *IPC* also included the requirement to use a 15-minute, 100-year rainfall rate for designing the secondary drainage system, which was also in the *Standard Plumbing Code* before the *IPC* replaced it.

*ASCE 7-16* added the requirement that the secondary drainage systems be designed based on the 15-minute, 100-year rainfall rate, which is contrary to current *IPC* requirements. The *IPC* requirements are also in conflict in the current *IBC*. The 15-minute, 100-year rainfall rate is double (two times) the 1-hour, 100-year rainfall rate. In other words, to comply with ASCE 7 and Section 1608.3 and Section 1611.2 of the *IBC*, secondary drainage systems must be designed using twice the design rainfall rate than is required in the *IPC*.

As a result, the secondary drainage system design can meet the requirements of the IPC and not meet the requirements of ASCE 7 and the IBC. Chapter 3, Sections 3.4, and 3.5 of *Roof Drainage* (see Ref. 2) provides an in-depth discussion of the use and importance of the 15-minute, 100-year design standard for secondary drainage systems. In summary, ASCE 7 has doubled the "Rainwater Loads" on roofs.

In addition, Jeffrey Levine (see Ref. 6) conducted a review of US rainfall intensity data reports and various plumbing codes from 1935 to the present. He found that "plumbing codes have remained relatively static, rarely contain current rainfall intensity data, and truly represent a minimum standard with regard to the design of roof drainage systems."

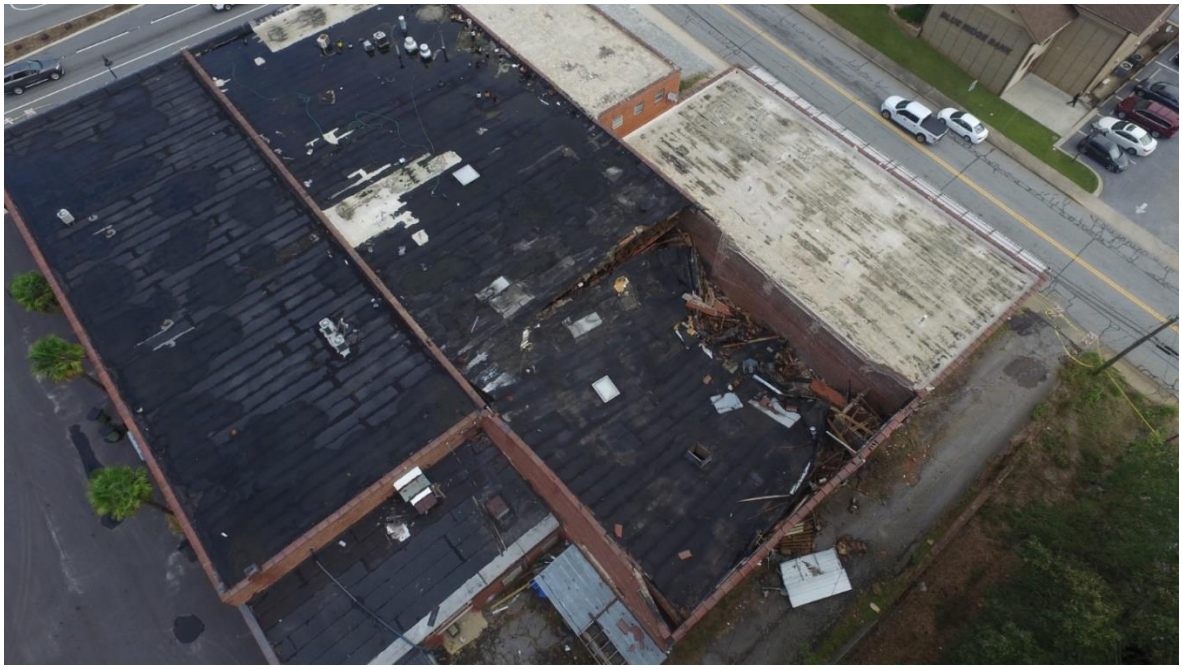
**Catastrophic Failures Due to Ponding**

Ponded water on roofs, the accumulation of water on roofs before it drains, or ponding instability have the potential to cause serious structural/life safety issues, including roof collapses. There is a precedent for the ICC recognizing the significance of changes in design standards based upon new inputs, especially when related to life-safety issues. IEBC 2021 Section 403.5 "Bracing for unreinforced masonry parapets upon reroofing" and Section 403.8 "Roof diaphragms resisting wind loads in high-wind regions" require the correction of potentially hazardous conditions from seismic and wind forces. When reroofing a building in a high-wind region, an analysis of the structural diaphragms and correction of the identified deficiencies are required.

*IEBC 2018* "Section 302.2 "Dangerous Conditions" gives the building official "the authority to require the elimination of conditions deemed *dangerous*." *IEBC* 2018 "Section 706.2 "Addition or replacement of roofing or replacement of equipment" requires replacement or alteration to structural elements when the structural element's design dead, live or snow load, including snow drift effects, is increased by 5 percent. In re-cover roof situations, the additional load from the re-cover roof is not the only increase in gravity loads, because the changes in the *IBC* and *ASCE 7*, as discussed above, have doubled the gravity load from rainwater. These "Rain Loads" changes in ASCE 7 were made to address significant life-safety structural issues related to water accumulation on roofs. Michael O'Rourke, PhD, PE and Aaron Lewis, PE have published an excellent monograph regarding Rain Loads, as discussed further in Reference 5.

**Case Studies of Failures**

**Case Study 1:** Roof Failure in Walhalla, South Carolina on October 8, 2017



**Background:**
Construction Science and Engineering, Inc. of Westminster, SC (CS&E) performed an investigation following the collapse of a roof structure in Walhalla, SC in October of 2017. Research was limited, due to the number of weather recording stations proximate to the subject building; however, a private weather station within three (3) miles of the building reported 4.3" of rainfall on the day of the event.

**Findings:**
CS&E determined the primary cause of the roof collapse was excessive and rapid water accumulation on the roof during a significant rain event on October 8, 2017. The reported five inches (5") of rainfall reported by an adjacent resident was similar to the reported 4.3" of rainfall measured from the closest private weather station. Additionally, a measured 3.5" ponded water-depth on the rear roof area of an adjacent building, three (3) days following the rain event, corroborated the reported rainfall amounts.

A twenty pounds-per-square-foot (20 psf) unreduced roof design load was specified as the standard in the applicable building code. An accumulation of five inches (5") of rainwater equates to approximately twenty-six (26) psf load on a roof structure. This 26 psf roof load represented approximately thirty percent (30%) higher loading than the applicable code-prescribed design load. Incidental to the installation of a granular cap sheet below the tile parapet cap, the weight of the accumulated water on the roof is believed to have initiated a steel truss collapse by pulling a portion of the masonry brick parapet wall onto the roof. This impact-force was consistent with the damage observed at the subject property.

IBC's Figure 1106.1(3), "1-Hour, 100-Year Rainfall (inches) for the Eastern United States" indicates the 100-year hourly rainfall rate as 4.0-inches for Walhalla, South Carolina.

**Case Study 2:** Roof Failure in Kinston, North Carolina on August 1, 2020

**Background:**
REI Engineers, Inc. (REI) of Greenville, NC performed an investigation following the collapse of a roof structure in Kinston, NC in August of 2020.

**Findings:**
REI determined the cause of the collapse was overloading of the roof framing system. Investigation of the roof's drainage system indicated that the primary drainage scuppers were obstructed by debris. Additionally, the roof did not include secondary (emergency) drainage. The combined factors of blockage of the primary drainage system and lack of a secondary/overflow drainage system led to excessive water accumulation on the roof, as it was contained by the roof's adjoining parapet wall. This accumulated rainwater load exceeded the framing's structural capacity and a failure of the framing occurred by collapse.

**References**

1. *System Research Project: Flow Rate Through Roof Drains* by Julius Ballanco, PE, CPD, FASPE, IAPMO/ASPE (2012).
2. *Roof Drainage*, Second Edition by Stephen L. Patterson, PE RRC and Madan Mehta, PhD, PE, IIBEC/RCI Foundation (2021).
3. *ASCE 7 -16*: American Society of Civil Engineers (2016)
4. "Roof Drainage Design, Roof Collapses, and the Code" by Stephen L. Patterson, PE RRC and Madan Mehta, PhD, PE, IIBEC (2018).
5. *Rain Loads: Guide to the Rain Load Provisions of ASCE 7-16*, ASCE Press, (2020).
6. Levine, Jeffrey - "Rainfall Intensity Changes Over Time: Have the Codes Kept Pace?" *IIBEC Interface*, October2021.
7. Coffman, Scott D., and Thomas Williamson. 2019. "Low-Slope Roofs: Design Solutions for Building Code-Permitted Low-Slope Applications that Cause Ponding Water." *Civil + Structural Engineering*.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 1

CODE: International Building Code 2018 SECTION: 1502.5

PROPONENT: Christian N. Dawkins, P.E. DATE: 12/9/2021

EMAIL: chris.dawkins@beechconsulting.com

ADDRESS: Suite 401A, 3883 Rogers Bridge Road, Duluth, GA 30097

TELEPHONE NUMBER: 770-476-2362 FAX NUMBER: 770-476-1047

CHECK ONE:
- ☐ Revise section to read as follows:
- X Add new section to read as follows:
- ☐ Delete section and substitute the following:
- ☐ Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED:~~ UNDERLINE MATERIAL TO BE ADDED

☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION: Add new section as proposed below

**1502.5 Waterproofing weather-exposed areas.**
Balconies, decks, landings, exterior stairways, occupied roofs, and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of 1/4 unit vertical in 12 units horizontal (2% slope) for drainage away from adjoining walls or assemblies.

REASON/INTENT:
This proposed code section is needed to ensure life-safety of users of exposed balconies or similar structures in cold climates and to promote proper bulk-water flow away from exterior walls/assemblies so that ponding does not occur on such structures. In cold climates, if ponding occurs on a balcony/similar structure, it could potentially freeze, causing a life-safety issue to the structure's users. These slope and waterproofing requirements for exposed balconies/similar structures do not exist within other IBC sections.

Section 1402.3 of the 1997 Uniform Building Code (UBC) stated:

**"1402.3 Waterproofing Weather-exposed Areas.** Balconies, landings, exterior stairways, occupied roofs, and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of 1/4 unit vertical in 12 units horizontal (2% slope) for drainage."

During the transition from the UBC/SBC to the IBC, this important code standard was omitted, and should be incorporated into the IBC.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
There is no financial impact for this proposed amendment.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 2

CODE: International Building Code 2018 SECTION: 1511.3.1.1 Exceptions

PROPONENT: Christian N. Dawkins, P.E. DATE: 12/9/2021

EMAIL: chris.dawkins@beechconsulting.com

ADDRESS: Suite 401A, 3883 Rogers Bridge Road, Duluth, GA 30097

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CHECK ONE: [X] Revise section to read as follows: [ ] Add new section to read as follows:
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~~LINE THROUGH MATERIAL TO BE DELETED:~~ UNDERLINE MATERIAL TO BE ADDED

[ ] Approve [ ] Approve as amended (DCA STAFF ONLY) [ ] Disapprove [ ] Withdrawn

DESCRIPTION:

**1511.3.1.1 Exceptions.** A *roof recover* shall not be permitted where any of the following conditions occur:

1. Where the existing roof or roof covering is ~~water soaked~~ found to have moisture present from Infrared testing (per ASTM C1153−10 (Reapproved 2015)), Electrical Impedance testing (per ASTM D7954/ D7954M −15a) or Nuclear testing (per ANSI/SPRI/RCI NT-1 2012 (Reapproved 2017)) to the extent the existing roof or roof covering cannot be removed and restored on a spot basis, or where the existing roof or roof covering has deteriorated to the point that ~~the existing roof or roof covering~~ it is not adequate as a base for additional roofing.
2. Where the existing roof covering is slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

REASON/INTENT:

The term “water soaked” is not clearly defined. If a roof is recovered and the underlying, existing roof still contains moisture, the new system is in a compromised state from the start; specifically, subject to accelerated roof deck and fasteners decay and loss of R-value and wind-uplift resistance. The referenced standards added to the exception provide specific protocols for determining the presence of moisture within existing roof systems. These methods are more accurate than a few small core cuts taken at random areas, where moisture-laded/water-damaged material can be missed. These three consensus-based standard test methodologies are well established, easy to perform, and allow cost-effective testing of the entire roof surface area in a short amount of time. Performing these tests reduces the possibility of not identifying areas of moisture or water-damaged material within an existing roof and its related substrate materials. These standards provide a clear definition of “water soaked” while allowing moisture-laden or water-damaged materials, where discovered, to be removed and infilled with like material, thereby enabling a roof recover without unintended consequences.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
The cost to apply the above-discussed consensus-based testing standards is minimal; generally, less than $0.04 per square foot. Furthermore, the standard protocol tests can be performed quickly, not adding delay to re-roofing projects. The cost of the equipment and training necessary to be proficient with these testing procedures is nominal; generally, less than $5,000.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 1

CODE: International Residential Code 2018 SECTION: R903.5

PROPONENT: Christian N. Dawkins, P.E. DATE: 12/9/2021

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CHECK ONE: ☐ Revise section to read as follows: X Add new section to read as follows:

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~~LINE THROUGH MATERIAL TO BE DELETED:~~ UNDERLINE MATERIAL TO BE ADDED

☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION: Add new section as proposed below

**R903.5 Waterproofing weather-exposed areas.**
Balconies, decks, landings, exterior stairways, occupied roofs, and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of 1/4 unit vertical in 12 units horizontal (2% slope) for drainage away from adjoining walls or assemblies.

REASON/INTENT:
This proposed code section is needed to ensure life-safety of users of exposed balconies or similar structures in cold climates and to promote proper bulk-water flow away from exterior walls/assemblies so that ponding does not occur on such structures. In cold climates, if ponding occurs on a balcony/similar structure, it could potentially freeze, causing a life-safety issue to the structure's users. These slope and waterproofing requirements for exposed balconies/similar structures do not exist within other IRC sections.

Section 1402.3 of the 1997 Uniform Building Code (UBC) stated:

**"1402.3 Waterproofing Weather-exposed Areas.** Balconies, landings, exterior stairways, occupied roofs, and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of 1/4 unit vertical in 12 units horizontal (2% slope) for drainage."

During the transition from the UBC/SBC/CABO to the IRC, this important code standard was omitted, and should be incorporated into the IRC.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:
There is no financial impact for this proposed amendment.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 1

CODE: International Residential Code 2018 SECTION: R703.7.3

PROPONENT: Christian N. Dawkins, P.E. DATE: 12/9/2021

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ADDRESS: Suite 401A, 3883 Rogers Bridge Road, Duluth, GA 30097

TELEPHONE NUMBER: 770-476-2362 FAX NUMBER: 770-476-1047

CHECK ONE: X Revise section to read as follows: ☐ Add new section to read as follows:

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☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

*Water-resistive barriers* shall be installed as required in Section 703.2 and, where applied over ~~wood-based~~ sheathing, shall include a water-resistive, vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper. The individual layers shall be installed independently such that each layer provides a separate continuous plane and any flashing, installed in accordance with Section R703.4 and intended to drain to the *water-resistive barrier* shall be directed ~~between the layers~~ over the top of the water-resistive barrier.

REASON/INTENT:

Section R703.7.3 of the IRC currently specifies that any flashing is to be installed between the two layers of building paper. This current direction by the IRC causes bulk water to be trapped between the layers of paper/water-resistive barrier, and not expeditiously exiting the wall cavity, which can lead to unintended water migration to structural components within the wall assembly. With this proposed change, the code statement is modified to require flashing to be applied over the top of the water-resistive barrier so that water can effectively drain to its downstream weep assembly. This amendment should apply to all sheathing materials, not just wood-based sheathings.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:

There is no financial impact for this proposed amendment.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE 1 OF 2

CODE: Georgia Residential Code SECTION: _____

PROPONENT: Eric Lacey, Responsible Energy Codes Alliance DATE: 12/14/2021

EMAIL: eric@reca-codes.com

ADDRESS: 1850 M Street, NW, Suite 610, Washington, DC 20036

TELEPHONE NUMBER: (202) 339-6366 FAX NUMBER: (202) 342-0807

CHECK ONE: ☒ Revise section to read as follows: ☐ Add new section to read as follows:

☐ Delete section and substitute the following: ☐ Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED:~~ UNDERLINE MATERIAL TO BE ADDED

☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐Withdrawn

DESCRIPTION:

Revise Georgia International Residential Code 2020 Amendments as follows:

**SECTION R303**
**LIGHT, VENTILATION AND HEATING**

~~*Revise Section R303.4 'Mechanical ventilation' to read as follows:~~

~~**R303.4 Mechanical ventilation.** Where the air infiltration rate of a *dwelling unit* is 3 air changes per hour or less where tested with a blower door at a pressure of 0.2 inch w.c (50 Pa) in accordance with Section N1102.4.1.2, the *dwelling unit* shall be provided with whole-house mechanical ventilation in accordance with Section M1505.4.~~

~~(Effective January 1, 2020)~~

REASON/INTENT:

This proposal would help ensure that all new residential homes maintain healthy indoor air quality by restoring the air tightness threshold for requiring mechanical ventilation to ≤5 air changes per hour (ACH50) that is contained in Section R303.4 of the 2018 IRC. For several years, the model codes – including the IRC and IECC – have recognized the importance of building homes with tighter envelopes and an adequate level of fresh air. Georgia's current amendment to Section R303.4 creates a loophole that could allow inadequate amounts of fresh air, which could create long-term health and safety issues for building occupants. Mechanical ventilation systems provide a consistent and predictable supply of fresh air to occupants, and dilute indoor air contaminants such as viruses, bacteria, and volatile organic compounds.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:

This proposal will only increase costs for homes with envelope air tightness between 3 and 5 air changes per hour that may not have included mechanical ventilation. For all other homes, there should be no change. Depending on the strategy used for mechanical ventilation, the additional costs should be between $500-2,500 at construction, but the long-term benefits of a safer and healthier home far outweigh any initial costs.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM INSTRUCTION SHEET

1. Do not complete the line entitled "Item No._____".
2. Use a separate form for each proposed code amendment.
3. "Sheet ____ of _____" indicates the number of sheets for each individual proposed code amendment, not the number of sheets for all the amendments submitted.
4. Identify the code and code section that is the subject of the proposed amendment.
5. The proponent's name, address, telephone number and fax number must be filled out completely.
6. Be sure to indicate the type of recommended action in the space referred to as "Check One".
7. If the proposed amendment revises the language of the code section, deletes the entire code section, or deletes the entire code section and offers substitute language, include the language of the present code section and line through the language to be deleted and underline the language of the proposed amendment.
8. Under the "Reason" section, provide the reasoning behind the proposed code amendment. The reason should be clear and concise. Test reports, standards or other supporting information and documentation may be submitted with the proposed amendment and must be attached to the amendment form.
9. **A Statement of Financial Impact must accompany all proposed code amendments.** The statement should be clear and concise. Test reports, standards or other supporting information and documentation may be submitted with the proposed amendment and must be attached to the amendment form.
10. **All proposed amendments must be typed and completed in full and the original submitted to the Codes and Industrialized Buildings Section of the Department of Community Affairs NO LATER THAN DECEMBER 15TH.** The proposed code change shall be submitted for review to the State Codes Advisory Committee at their quarterly meeting in January. An incomplete form will be sent back to the proponent for completion. An amendment submitted after the submittal deadline date will be returned to the proponent.
11. The proponent will be notified when the proposed amendment will be considered by the State Codes Advisory Committee.
12. Information concerning submittal of code amendments, including deadline dates for submittal, can be obtained by contacting the Codes and Industrialized Buildings Section at (404) 679-3118. All proposed code amendments should be submitted to:

The Department of Community Affairs
Codes and Industrialized Buildings Section
60 Executive Park South, NE
Atlanta, Georgia 30329-2231

May 2, 2022

Jim Reynolds
Construction Codes Industrialized Buildings Consultant
Georgia Department of Community Affairs
60 Executive Park South, NE
Atlanta, Georgia 30329

Subject: Flex Duct Availability and R-Values

Dear Jim,

ATCO understands that there is an agenda item regarding potential reduction in R-value for insulated ducts installed in Georgia residential applications. We have concerns that reducing insulation will create condensation within or sweating on the surface of ducts when installed in attics outside of the building thermal envelop. This promotion of condensation and sweating would potentially lead to mold and mildew growth, something of definite concern in areas conducive to condensation such as the Southeast in late spring, summer, and early fall.

It is our understanding that GDCA is making this consideration due to shortage of R-8 insulated ducts and seeking input regarding availability of flex duct in general. It should be noted that a reduction of R-value requirements for duct insulation would not solve the current availability issue of flexible duct. It would only result in reduced performance related to thermal efficiency.

Regarding allocation - although ATCO is providing more flex volume to the HVAC industry in 2022 than the same period in 2021, we continue to maintain allocation for all customers since the current demand outpaces capacity of materials and production. Raw material constraints and availability of labor continue to hamper successfully meeting this historical demand.

We are not able to offer meaningful insight into how long this high demand level will continue nor when material and labor constraints will ease. Our allocations are equal across all product R-values as the customers order product based on the R-value requirements in their market area. We produce all three common R-values based on the market demand.

A question was posed regarding over-wrapping R-6 ducts with duct wrap in order to achieve a higher R-value. ATCO does not recommend this practice as there is the very real potential for condensation to occur on the original vapor barrier surface of the duct.

ATCO, as a leading flex duct manufacturer, would like the opportunity to weigh in on the discussion and provide insight where appropriate. Feel free to reach out to me for further discussions.

Sincerely,

Ralph Koerber
VP, Manufacturing & Technical Services

cc: Ted Miltiades (GDCA)

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# AIR DUCT COUNCIL

1300 Sumner Ave, Cleveland, OH 44115
Tel: 216-241-7333, Fax: 216-241-0105
info@flexibleduct.org, *www.flexibleduct.org*


May 2, 2022

Jim Reynolds
Construction Codes Industrialized Buildings Consultant
Georgia Department of Community Affairs
60 Executive Park South, NE
Atlanta, Georgia 30329

Subject: Duct Insulation

Dear Jim,

The Air Duct Council (formerly Air Diffusion Council) was founded over 50 years ago as the industry organization representing more than 95% of North American manufacturers of insulated and non-insulated flexible air ducts. The Council was formed to promote and further the interests of the manufacturers of air distribution equipment, more specifically, flexible air ducts and related products, and the interests of the public in the areas of safety, quality, efficiency and energy conservation.

ADC understands that there is an agenda item regarding potential reduction in R-value for insulated ducts installed in Georgia residential applications. We have concerns that reducing insulation will create condensation within or sweating on the surface of ducts when installed in attics outside of the building thermal envelop. This promotion of condensation and sweating would potentially lead to mold and mildew growth, something of definite concern in areas conducive to condensation such as the Southeast in late spring, summer, and early fall.

ADC urges the GDCA to review closely this agenda item and consider the negative aspects of lowering required duct R-values. The Council is not sure what has led to this consideration. We would like the opportunity to weigh in on the discussion and provide insight into flexible ducts and the potential pitfalls of reducing the insulation of all ducts below current standards.

Sincerely,

Chris Edwards
President, Air Duct Council

Cc: Max Rietschier (GDCA)
Ralph Koerber (ADC, Engineering Committee Chairman)

# ERB Subcommittee Code Amendments
# 5/2/2022 Meeting

Updates to Christian N. Dawkins, P.E.
Proposed Code Changes (PCCs)
submitted on 12/9/2021

*Detailed Reason/Intent & Financial Impact Statements in 12/9/2021 submissions have not changed*

# Item Number: IBC-2023-24

Original PCC on 12/09/2021 - Section 1511.1 Revised Exception 1.

*Roof replacement* or *roof recover* of existing low-slope *roof coverings* shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section 1507 for roofs that provide *positive roof drainage* and meet the requirements of Section 1608.3 and Section 1611.2.

Now Proposed PCC 4/29/2022 - Section 1511.1 Revised Exception 1.

No change to the above

***Based on ICC feedback/approval at ICC 2024 hearings (S-44)***

# Item Number: IBC-2023-23

## Original PCC on 12/09/2021 - Section 1511.1 Revised Exception 2.

Recovering or replacing an existing *roof covering* shall not be required to meet the requirement for secondary (emergency overflow) drains or scuppers in Section 1502.2 for roofs that provide for *positive roof drainage*, and have been determined to resist all design loads. For the purposes of this exception, existing secondary drainage or *scupper systems* required in accordance with this code shall not be removed unless they are replaced by secondary drains or *scuppers* designed and installed in accordance with Section 1502.2.

## Now Proposed PCC 4/29/2022 - Section 1511.1 Revised Exception 2.

Recovering or replacing an existing *roof covering* shall not be required to meet the requirement for secondary (emergency overflow) drains or scuppers in Section ~~1503.4~~ 1502.2 for roofs that provide for *positive roof drainage* and meet the requirements of Section 1608.3 and Section 1611.2. For the purposes of this exception, existing secondary drainage or *scupper systems* required in accordance with this code shall not be removed unless they are replaced by secondary drains or *scuppers* designed and installed in accordance with Section ~~1503.4~~ 1502.2.

***Based on ICC feedback/consensus & approval at ICC 2024 hearings (S-45)***
***& corrects typographical errors found in IBC 2018 by Joel Rodriguez***

# Item Number: IBC-2023-25

Original PCC on 12/09/2021 – Add Section 1502.5

**1502.5 Waterproofing weather-exposed areas.**
Balconies, decks, landings, exterior stairways, occupied roofs, and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of 1/4 unit vertical in 12 units horizontal (2% slope) for drainage away from adjoining walls or assemblies.

Now Proposed PCC 4/29/2022 – Add Section 1502.5

**1502.5 Drainage of weather-exposed areas.**
Where the surface of balconies, decks, landings, porches, stairways and similar surfaces are exposed to weather and are not slotted or perforated to drain, they shall be sloped to drain.

***Based on ICC feedback/consensus discussions at/following ICC 2024 hearings (S-3) and being revised/resubmitted during ICC 2024 Public Comment Period***

# Item Number: IBC-2023-26

Original PCC on 12/09/2021 – Revise Section 1511.3.1.1

**1511.3.1.1 Exceptions.** A *roof recover* shall not be permitted where any of the following conditions occur:

1. Where the existing roof or roof covering is ~~water soaked~~ found to have moisture present from Infrared testing (per ASTM C1153−10 (Reapproved 2015)), Electrical Impedance testing (per ASTM D7954/ D7954M −15a) or Nuclear testing (per ANSI/SPRI/RCI NT-1 2012 (Reapproved 2017)) to the extent the existing roof or roof covering cannot be removed and restored on a spot basis, or where the existing roof or roof covering has deteriorated to the point that ~~the existing roof or roof covering~~ it is not adequate as a base for additional roofing.
2. Where the existing roof covering is slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

Now Proposed PCC 4/29/2022 – ***Withdraw this PCC***

***Based on ICC feedback/consensus discussions at/following ICC 2024 hearings (S-55)***
***For ERB info, is being revised/resubmitted during ICC 2024 Public Comment Period***

# Item Number: IRC-2023-27

Original PCC on 12/09/2021 – Add Section R903.5

**R903.5 Waterproofing weather-exposed areas.**
Balconies, decks, landings, exterior stairways, occupied roofs, and similar surfaces exposed to the weather and sealed underneath shall be waterproofed and sloped a minimum of 1/4 unit vertical in 12 units horizontal (2% slope) for drainage away from adjoining walls or assemblies.

Now Proposed PCC 4/29/2022 – Add Section R903.5

**R903.5 Drainage of weather-exposed areas.**
Where the surface of balconies, decks, landings, porches, stairways and similar surfaces are exposed to weather and are not slotted or perforated to drain, they shall be sloped to drain.

***Based on ICC feedback/consensus discussions at/following ICC 2024 hearings (RB-257) and being revised/resubmitted during ICC 2024 Public Comment Period***

# Item Number: IRC-2023-28

## Original PCC on 12/09/2021 – Revise Section R703.7.3

*Water-resistive barriers* shall be installed as required in Section 703.2 and, where applied over ~~wood-based~~ sheathing, shall include a water-resistive, vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper. The individual layers shall be installed independently such that each layer provides a separate continuous plane and any flashing, installed in accordance with Section R703.4 and intended to drain to the *water-resistive barrier* shall be directed ~~between the layers~~ over the top of the water-resistive barrier.

## Now Proposed PCC 4/29/2022 – Revise Section R703.7.3

*Water-resistive barriers* shall be installed as required in Section 703.2 and, where applied over ~~wood-based~~ sheathing, shall include a water-resistive, vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper. The individual layers shall be installed independently such that each layer provides a separate continuous plane and any flashing, installed in accordance with Section R703.4 and intended to drain to the *water-resistive barrier* is directed ~~between the layers.~~ over the top of the water-resistive barrier.

***Corrects typographical error in 12/9/21 submission and based on ICC feedback/consensus discussions at ICC 2024 hearings (RB-225). The similar IRC 2024 PCC was withdrawn & modified/collaborated with other industry groups and incorporated into the S-240 PCC, which passed, as part of section re-organizations in forthcoming 2024 code.***

Thank you
Questions & Dialogue

– End –

POWERS
HEATING & AIR

May 19, 2022

Ryan Taylor, Chairman ERB Subcommittee
Georgia Department of Community Affairs
60 Executive Park South, NE
Atlanta, Georgia 30329

Subject: Proposed Amendment resulting from the PMG Subcommittee concerns with Flex Duct Availability

Mr. Chairman,

I have proposed an amendment regarding a serious supply chain issue in Georgia of "Flex Duct" availability. Prior to proposing this amendment, I have made multiple inquiries to verify and validate information from multiple sources and industries. I have spoken directly with manufacturers, wholesale distributors, HBA representatives, Building Inspectors, Building Code officials, contractors, and various trade association representatives.

The current Georgia adopted IECC requires R8 flex ductwork in all residential HVAC systems with some exceptions based on the original design of the residential structure as it relates to the entire building envelop such as a fully sealed home with spray foam and the entire HVAC system being installed within the sealed envelope.

Currently the supply chain for flex ductwork is extremely poor throughout the USA. Two of the largest manufacturers have confirmed that a multiple of extraordinary circumstances has severely impacted their ability to produce and supply ALL variants of the insulated flex ductwork here in the USA which has caused a severe shortage for R8, R6, and R4 flex ductwork. The combination of the supply of materials used to manufacture, the shortage of trained production personnel during and since the pandemic, and the significant increase in demand due to the increase in the Residential New Construction (RNC) markets as well as the increase in demand for the replacement HVAC market; has significantly impacted their ability to meet current demand. This is further supported by the May 2, 2022, letter from ATCO Flexible Duct Products to DCA. ATCO states they are "providing more flex volume to the HVAC industry in 2022 than the same period in 2021."

The manufacturers suggest that they are producing and allocating ALL R-value flex based on a pro rata basis based on pre-supply chain demand (2019 & 2020). Wholesales in Georgia have been on an allocation basis for about a year with contractors also being on an allocation from the wholesalers. Their volume of backorders is staggering. This week I meet with the Metro Atlanta

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Email service@callpowers.com
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Residential and Commercial Installation and Service

Conditioned Air Contractors and with the West Georgia Conditioned Air Contractors. The groups are comprised of new construction contractors, replacement systems contractors, inspectors, and major wholesalers of HVAC supplies in Georgia. Every participant of the system has been waiting days, weeks and even months to get enough of the product to complete open projects/homes. No one party in this supply chain from the wholesale distributor to the contractor has any idea what size or R-Value flex is available until shipments arrive from the factories. The wholesalers have been advised that it will be at least the first quarter of 2023 before they see any possibility of getting back on track with increasing production; and this is still contingent upon raw materials components in the supply chain not being further impacted by continued international turmoil and labor availability.

Georgia is a top 5 RNC state and currently has a housing shortage which equates to a significant demand for new housing and construction materials. The South outpaces all the other 3 Regions combined in demand of new home construction. In addition, Georgia has a large number of homes that have been under construction and not complete due to the lack of materials to complete them. Smaller RNC contractors are not getting the allotments that larger RNC contractors are receiving; therefore, their houses are still waiting for the R8 Flex. Contractors, Georgia Homebuilders, and the various inspections groups agree that the HVAC ductwork issue is causing significant delays, holding up other subcontractor's work, and delaying the completion of homes.

In some situations, alternative solutions have been utilized such as switching to metal ductwork with R8 ductwrap, upgrading the building envelope, or altering the framing and structure to allow for ducts to be inside the envelope. In most cases those alternatives are beyond the basis of the original design, or the structure is too far along to make those changes.

In conclusion, allowing a R6 flex duct with the radiant barrier in attics or a combination of R8 & R6 flex ductwork during this period of time should help alleviate the backlog of RNC projects sitting in Georgia. It is my recommendation that ERB Subcommittee accept this amendment and move it as quickly as possible to the DCA Board for consideration.

Thank you,

Elaine Powers

ELAINE POWERS, Chairperson PMG Subcommittee

Cc: Jim Reynolds, DCA

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE _____ OF _____

CODE: Georgia State Minimum Standard Energy Code, Residential Provisions SECTION: Multiple

PROPONENT: SCAC PMG Subcommittee (Elaine Powers, Chair) DATE: 04|29|2022

EMAIL: elaine@callpowers.com

ADDRESS: 200 Tiger Way, PTC Ga 30269

TELEPHONE NUMBER: (404)213-8382 FAX NUMBER: ( ) -

CHECK ONE:
☐ Revise section to read as follows: ☒ Add new section to read as follows:
☐ Delete section and substitute the following: ☐ Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED:~~ UNDERLINE MATERIAL TO BE ADDED

☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

Add a new section beneath the "Residential Provisions" heading in the Georgia State Supplements and Amendments to the International Energy Conservation Code (2015 Edition) as follows:

Where required by Georgia State Minimum Standard Energy Code, R6 Flexible Duct combined with an approved continuous Radiant Barrier may be substituted for the required R8 Flexible Duct.

The use of this (Exception/substitution) will be valid until June 30th, 2023 at the discretion of the authority having jurisdiction.

(Effective September 1st, 2022)

REASON/INTENT:

The Georgia State Minimum Standard Energy Code requires duct work insulated to R-8 when installed in hot attics. There are four sections in which this requirement appears. Current supply chain challenges are keeping contractors from purchasing flex duct insulated to R-8 as required by the energy code. This lack of product is keeping jobs underway from making progress. This is a significant issue since lack of duct work can keep projects stalled in the early phases of the project, resulting in increased costs such as carrying costs.

This amendment is intended to be a temporary solution that provides relief to current projects and those starting in the immediate future. The nine-month window created by this amendment allows future project to

explore other alternatives such as installing the ductwork within the thermal boundary so there is no requirement for R-8 insulation on ducts.

Alternatives to flex duct may not be viable because of the project design or cost of materials. For example, sheet metal duct work costs between 20-40% more than flex duct systems. Additionally, metal ductwork with insulation requires more space than flex duct products.

Southface Institute has modeled five scenarios in which ductwork in hot attics was changed from R-8 to R-6 with a continuous radiant barrier. The houses with R-6 ducts and a continuous radiant barrier performed slightly better in the summer and slightly worse in the winter. Additionally, a mechanical system subject matter expert at Southface noted that Georgia used R-6 insulation on ducts in hot attics previously with no significant condensation issues reported.

This amendment does not require anyone to use flex duct or flex duct in combination with a continuous radiant barrier. Other materials and means, including keeping the ducts within the thermal boundary, remain available as do all of the compliance paths in the energy code.

The language “at the discretion of the authority having jurisdiction” has been included to allow building officials to deny this substitution where R-8 flex duct remains available and/or if it becomes readily available prior to the close of the nine-month window.

---

FINANCIAL IMPACT OF PROPOSED AMENDMENT:

It’s difficult to accurately forecast the financial impact of this amendment. Changing flex duct from R-8 to R-6 and adding a continuous radiant barrier may save some cost for the flex duct and add some cost for the continuous radiant barrier. We think people who use this amendment will choose to do so because the cost of adding a continuous radiant barrier allows them to reduce carrying costs. Thus, the cost could be lower.

The substitution could also be used if the project already incorporated a radiant barrier and was stalled waiting for ductwork. In this case, the cost would likely be lower.

As stated in the reason/intent section, this proposed amendment does not provide direction to designers or builders. It simply creates a temporary option in additional to other materials and means already available.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM

ITEM NO: _____ (DCA USE ONLY) PAGE _____ OF _____

CODE: _____ SECTION: _____

PROPONENT: _____ DATE: 4/29/2022

EMAIL: _____

ADDRESS: _____

TELEPHONE NUMBER: _____ FAX NUMBER: _____

CHECK ONE:
☐ Revise section to read as follows:
☐ Add new section to read as follows:
☐ Delete section and substitute the following:
☐ Delete without substitution:

~~LINE THROUGH MATERIAL TO BE DELETED.~~ UNDERLINE MATERIAL TO BE ADDED

☐ Approve ☐ Approve as amended (DCA STAFF ONLY) ☐ Disapprove ☐ Withdrawn

DESCRIPTION:

Enact an emergency declaration for the temporary allowance to utilize R6 flex duct in residential HVAC duct systems through June 30, 2023, due to the critical supply chain disruption and subsequent burden on new home and replacement HVAC systems. (And provide for up to one six-month extension of this time)

REASON/INTENT:

The current Georgia adopted IECC requires R8 flex ductwork in all residential HVAC systems with some exceptions based on the original design of the residential structure as it relates to the entire building envelop such as a fully sealed home with spray foam and the entire HVAC system being installed within the sealed envelope.

Currently the supply chain for flex ductwork is extremely poor throughout the USA. Two of the largest manufacturers have confirmed that a multiple of extraordinary circumstances has severely impacted their ability to produce and supply ALL variants of the insulated flex ductwork here in the USA which has caused a severe shortage for R8, R6, and R4 flex ductwork. The combination of the supply of materials used to manufacture, the shortage of production personnel during the pandemic which has continued to a lesser degree, and the significant increase in demand due to the increase in the Residential New Construction (RNC) markets as well as the increase in demand for the replacement HVAC market has significantly impacted their ability to meet the demand. Currently they state that they are producing ALL R-value flex based on a pro rata basis based on pre-supply chain demand.

Wholesales in Georgia have been on an allocation basis for a year with contractors also being on an allocation from the wholesalers. Everyone part of the system has been waiting days, weeks and even months to get enough of the product to complete even one house in many instances. The wholesalers are estimating that it will be at least the first quarter of 2022 before they see any possibility of getting back on track with increasing production and this is still contingent upon raw materials components in the supply chain not being further impacted by continued international turmoil.

Georgia is a top 5 RNC state and currently is considered to have a housing shortage which equates to a significant demand for new construction. In addition, Georgia has a number of homes that have been under construction and not complete due to the lack of materials to complete them. According to HVAC contractors throughout the State and attested by the Georgia Homebuilders and the various inspections groups many of these are due to the lack of materials to complete the HVAC systems.

By allowing a combination of R8 & R6 flex ductwork in the HVAC systems during this period of time should help alleviate the backlog of RNC projects sitting in Georgia.

Alternatives to the Flex Duct systems, may or may not be viable and in most cases contractors, builders and design professionals have already tried and or been able to make some modifications to bypass the flex duct needs in some projects. These alternatives include utilizing more metal ductwork with R8 duct wrap, duct board, and specifically for insulation a product known as “bubble wrap”.

FINANCIAL IMPACT OF PROPOSED AMENDMENT:

There is a nominal cost involved in the reduction of the R8 value to R6 value for those homes over the life of the duct system associated with the cost of operations. However, if you interject the rising cost of home mortgage rates with the cost of the homes waiting to be completed with the R8 value flex and the cost of the housing shortage to the Georgia – it makes sense to allow for the R6 in the interim.

The alternatives to the flex ductwork are more expensive from the onset. A sheetmetal ducted HVAC systems with R8 duct wrap or "Bubble wrap" costs between 20%-40% more than your more common Flex duct systems. Additionally, metal ductwork with properly installed insulation takes up more space than the flex duct products and are not flexible in where they can be installed. This can put an added financial burden on the Builder.

NAIMA, the North American Insulation Manufacturers Association, has stated that they are at full production with no supply chain issues for the Duct board products and the R8 Duct wrap products used for sheetmetal ductwork. However, the bigger picture is that the cost of sheetmetal has risen over 60% in the last 8 months of 2021 and currently there has been another cost increase of between 10%-15% for the second quarter in a row from wholesalers to contractors. Additionally, some wholesalers are starting to have supply deliveries not keeping up with demand for the sheetmetal ductwork and projecting more cost increases to come.

# GEORGIA DEPARTMENT OF COMMUNITY AFFAIRS

## CODE AMENDMENT FORM INSTRUCTION SHEET

1. Do not complete the line entitled "Item No._____".
2. Use a separate form for each proposed code amendment.
3. "Sheet ____ of _____" indicates the number of sheets for each individual proposed code amendment, not the number of sheets for all the amendments submitted.
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proponent for completion. An amendment submitted after the submittal deadline date will be returned to the proponent.

11. The proponent will be notified when the proposed amendment will be considered by the State Codes Advisory Committee.

12. Information concerning submittal of code amendments, including deadline dates for submittal, can be obtained by contacting the Codes and Industrialized Buildings Section at (404) 679-3118. All proposed code amendments should be submitted to:

The Department of Community Affairs
Codes and Industrialized Buildings Section
60 Executive Park South, NE
Atlanta, Georgia 30329-2231