Petition for Declaratory Statement
Before the Florida Building Commission

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DS 2017-045

List of Statutes on which the Declaratory Statement is sought:

Florida Building Code Fifth Edition Energy Conservation Code

§ R303.4

§R101.4.9

§R402.4.1.2

Background:

Andrew C. Ask, P.E., is a Cape Coral MEP Consulting Engineer. In addition to traditional HVAC, Plumbing, and Electrical design services for architects, he specializes in advising building owners and contractors on preventing and remediating damage resulting from heat and moisture related to our hot-humid climate. An important component of this work is evaluating building air leakage, whether by measuring air leakage in existing buildings or predicting air leakage in new construction. As of July, 01, 2017, pursuant to the referenced code sections, building air leakage in new homes must be within a certain range: if exceeded, they will not meet the code; if too tight, they must be equipped with mechanical ventilation. All parties involved—design professionals, contractors, testers, and building officials—will need to clearly understand these new requirements in order to comply. The new code provisions contain a number of technical terms that have no common meaning. In Mr. Ask's opinion, these terms need to be defined unambiguously so that all affected parties know what is expected of them. Absent these definitions, the code sections are vague and will be difficult if not impossible to enforce.

Specifically, these terms need to be defined: Air Change, Air Changes per Hour, Air Change Rate (ACH), Air Leakage Rate, Air Infiltration Rate, Blower Door, Building Volume, Infiltration Volume, and *x*ACH50.

Text of Statutes on which the Declaratory Statement is sought:

The July 1, 2016, revision of the Florida Building Code, Residential included the amended Code Sections.

> ***R101.4.9 Blower door testing.*** *The mandatory blower door testing for residential buildings or dwelling units as contained in Section R402.4.1.2 of the Florida Building Code, 5th Edition (2014) Energy Conservation, shall not take effect until July 1, 2017, and shall not apply to construction permitted before July 1, 2017.*

So for projects permitted just a few weeks from now, after July 1st, A Blower Door Test will be mandatory. This is important due to the two companion requirements.

> ***R402.4.1.2 Testing.*** *The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 7 air changes per hour in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Testing shall be conducted by either individuals as defined in Section 553.993(5) or (7), Florida Statutes or individuals licensed as set forth in Section 489.105(3)(f), (g), or (i) or an approved third party. 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.*
>
> ***Mechanical R303.4 ventilation.*** *Where the air infiltration rate of a dwelling unit is less than 3 air changes per hour when tested with a blower door at a pressure of 0.2 inch w.c (50 Pa) in accordance with Section R402.4.1.2 of the Florida Building Code, Energy Conservation the dwelling unit shall be provided with whole-house mechanical ventilation in accordance with Section M1507.3.*

Question

Do the listed terms have a meaning that is generally-accepted and well-known within and by the construction industry, clear and unambiguous enough so that buildings can be designed, constructed, and tested so as to comply with the § R303.4, §R101.4., and §R402.4.1.2; and can such compliance be accurately reported to and evaluated by building officials?

Summary

The petitioner respectfully believes the answer to the question stated above is "NO." If so, the Building Commission is urged to make the meaning of the referenced code sections clear and unambiguous by directing petitioner to use the following definitions when interpreting and applying the referenced code sections:

Definitions Needed

AIR CHANGE[1]. The amount of air required to completely replace the air in a building whether by natural infiltration or mechanical ventilation. It is numerically equal to the Building Volume of the space expressed in cubic feet (ft.^{3})

AIR CHANGE RATE[1] (ACH). The number of times per hour the total volume of indoor air contained in a room or building is replaced with outdoor air and can be computed as

$$ACH = 60 \times Q \div V$$

Where[2]:

ACH	=	Air Change Rate per hour
Q	=	volumetric flow rate of air into space in CFM, ft.^{3}/minute
V	=	Building Volume, ft.^{3}

AIR CHANGES per HOUR[1]. Air Change Rate, ACH.

AIR LEAKAGE RATE[3]. The amount of air required to pressurize or depressurize a building to 50 Pascals when tested with a Blower Door, expressed in Air Changes per Hour (ACH).

AIR INFILTRATION RATE[3]. The amount of air that leaks into or out of a building at a given pressure, expressed in Air Changes per Hour (ACH).

BLOWER DOOR – A device that combines an air-moving fan, airflow meter and a covering to integrate the air-moving fan into the building opening for the purpose of measuring air leakage rate.

BUILDING VOLUME. Infiltration Volume, ft.^{3}

INFILTRATION VOLUME[4]. The volume, expressed in cubic feet, ft.^{3} within a building's thermal (or air) barrier conditioned (in whole or in part) by a heating or cooling system, including air-sealed attics; unvented crawl spaces; basements; and wall and floor cavities with at least one adjacent space conditioned. Cavity thickness for purposes of computing volume for CMU walls is from stucco face to drywall face; for stud-frame walls from exterior sheathing/insulation to drywall face; for insulated roof decks from top of roof sheathing to interior face of insulation.

*x*ACH50. The volume of air, x, measured in Air Changes per Hour (ft.3), required to maintain a building at a positive or negative pressure of 50 Pa. Example: 5ACH50

Respectfully Submitted,

ANDREW C. ÄSK, P.E., CONSULTING ENGINEER

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Footnotes

1. From Manual J, Appendix A, Glossary. Language is not exact.
2. See Equation 16.2 found at page 16.4 of 2017 ASHRAE Fundamentals, I=Q/V.
3. Consider reconciling Air Leakage Rate (§R402.4.1.2) and Air Infiltration Rate (§R303.4) in a future code revision. As used, the two terms are confusing. Do away with Air Leakage Rate.
4. For expanded definition, see Infiltration Volume, right hand column, Informative Appendix A, RESNET Draft Standard 380-2016. Petitioner's intent is to be consistent with a volume definition recently communicated to members of AIA Florida by Commissioner Brad Schiffer, AIA.