An overview of what's of ANSI/RESNET/ICC 301-2014 proposed in the 2019 version

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Webinar Overview

Part I – Background & Process

- Background on Standards/terminology
- Public Comment process
- Other related activities (inspections, testing)

Part II – Differences between 301-2014 & 301-201x (2019)

- Stuff we won't talk much about
- Approved interpretations & approved addenda
- Stuff we will talk about
- Scope, Definitions, modeling changes that address "Multifamily"

Part III - Q&A (but also do type in questions as we go)





What are the RESNET Standards?

MINHERS

RESNET

Standards Mortgage Industry Rating Systems National Home Energy

These Standards were developed by the Residential Evergy Services Network (RESNET) as amended in accordance with Chapter 5 of these Standards and adopted by the RESNET Board of Directors on January 1, 2013

ntial Energy Services Network, Inc. P.O. Box 4561 Oceanside, CA 92052-4561 www.resnet.us Published by:

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ANSI 301

ANSI 380

Enclosures, Airl of Heating and Air Distribution Standard for and Airflow of **Virtightness** of

lentilation Syst









How do the Standards get revised?

- Step 1: A revision is needed (based on a proposed 'amendment') Example: CFL vs LED
- Step 2: The 'amendment' is developed/vetted/revised by **RESNET SDC300 or its sub-committees**
- Step 3: The amended language, in strikethrough and "addendum" to the current Standard (usually dubbed PDS-01) underline format, is sent out to public comment as a proposed

Example from PDS-01 of Addendum G to 301-2014

controlled by a motion sensor efficacy is not measurable separately from the fixture, with a luminaire efficacy of 65 greater than <u>50-80</u> lumens/watt; an integrated solid state lighting fixture, whose light source Location that contains lamps/light bulbs with an average luminous efficacy equal to or Qualifying Tier II Light Fixture – A light fixture located in a Qualifying Light Fixture <u>lumens/watt;</u>or an outdoor light fixture that is controlled by a photocell; or an indoor fixture





How do the Standards get revised?

- Step 4: Public comment is taken into consideration and where needed, the "addendum" is revised and re-proposed (PDS-02)
- "Gosh, that seemed complicated, can't we just call it LED?"
- Step 5: "Addendum" is approved & is part of the Standard, but text, so ANSI 301-2014 still looks the way it used to the Standard isn't reprinted right away to integrate the revised
- Step 6: Every 3-5 years, integrate the approved Addenda

the draft of BSR/RESNET/ICC 301-201x (aka 301-2019) Example of how approved Addendum G to 301-2014 will look in

sensor Qualifying Tier II Light Fixture – A light fixture located in a Qualifying Light Fixture fixture that is controlled by a photocell; or an indoor fixture controlled by a motion Location that contains LED lamps/light bulbs; an integrated LED fixture; an outdoor light





Are approved addenda required for HERS?

303.1 Applicable Standards

with this Standard shall comply with the provisions of and Labeling of the Energy Performance of Low-Rise ANSI/RESNET/ICC 301-2014, "Standard for the Calculation All RESNET Home Energy Ratings conducted in accordance Residential Buildings using an Energy Rating Index."

304 Normative References

appendices. *approved only, not proposed; effective date TBD "Standard for the Calculation and Labeling of the Energy ANSI/RESNET/ICC 301-2014(Republished January 2016), Energy Rating Index.", including addenda* and normative Performance of Low-Rise Residential Buildings using an





301-2019 Development Timeline

- March 20: 2pm webinar on the overall changes in 301
- March 2 April 16, 2018: 1st round of public comment
- April June 2018: Respond & revise draft
- July August 2018: 2nd round of public comment
- If all goes well . August – October 2018: Respond & revise draft
- December 2018: RESNET approves 301-2019
- Spring 2019: ANSI approves 301-2019; MINHERS adopts & proposes for 2021 IECC; HERS software work to incorporate;
- January 2020: Available for use for HERS Ratings
- January 2021: Part of 2021 IECC for ERIs





How the Public Comment process works

Click on this link for the public comment page for 301-201x

- Download the PDF draft to read/review
- Check out the other comments posted
- Click on the link to submit your own comment

BSR/RESNET/ICC 301-201X DRAFT PDS-01, REVISIONS TO STANDARD ANSI/RESNET/ICC 301-2014

Only comments submitted through this online form will be accepted. Submit your comment below:

Affiliation: * (who you represent)	Last Name: *	First Name: *	Commenter





How the Public Comment process works

- Be clear by indicating the specific page, section, table and/or figure numbers that you are commenting on.
- Indicate whether your "intent" is an "objection" or not and whether your "comment type" is general/editorial/technical
- Include your justification for proposed change to the draft

RESNET [®]	Comment: * Include your justification for proposed change to draft standard	Comment Type: *	Comment Intent: *	Section/Table/Figure Number:	Page Number: *	Comment
HES Face Hones and Countin	 (a) (b) (c) (c)	Not an Objection	Select a Comment Intent			

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How the Public Comment process works

- Propose a SPECIFIC change, using strike and underline formatting.
- Copy the text from the draft and paste.
- Then strike out what you don't like; underline what you add.









Public Comment Tips/Reminders

- Don't submit comments that relate to MINHERS or 380; they will be rejected/ignored
- Don't be vague or provide general feedback. While it can be taken under consideration, it's not 'actionable'
- Don't submit comments on text that appears as black font.
- To address issues on that text, submit an amendment here
- Do submit comments on text that appears as red strikethrough or underline
- Don't have each Rater in your organization submit the same comment! One 'group' comment is enough!
- Reminder: volunteers on the committees respond to these comments (not paid RESNET staff)





What other Public Comments and proposed Addendum are happening?

2019 update to ANSI 380-2016

- for its 3 yr update Like ANSI/RESNET/ICC 301-2014, ANSI/RESNET/ICC 380-2016 is due
- January & is currently being revised BSR/RESNET 380-201x ended in 1st public comment of PDS-01
- 2nd round of public comment is soon (mid to late April)!







What other Public Comments and proposed Addendum are happening?

Adding Appendix A & B to ANSI 301-2014

Addendum F; Appendix A Insulation Grading & Assessment

- November Dec 2016: 1st round of public comment
- April 2018: 2nd round of public comment

Addendum N; Appendix B Inspection Procedures for Minimum Rated Features

- Like RESNET MINHERS Appendix A
- April 2018: 1st round of public comment

Q: What's the difference between an Addendum & an Appendix?





301-201<u>×</u> (2019) Part II – Differences between 301-2014 &

- Stuff we won't talk much about
- Approved interpretations & approved addenda
- Stuff we will talk about
- Scope, Definitions, modeling changes that address "Multifamily"





Differences between 301-2014 & 301-2019

- We started with ANSI 301-2014
- If it's up for public comment, it's shown in <u>underline</u> or strikethrough text (e.g., interpretations, multifamily stuff)
- These approved Addenda are integrated, using black text, but are NOT up for public comment
- Addendum A, Domestic Hot Water
- Addendum B, Innovative Design Requests
- Addendum D, Adopt ANSI/RESNET/ICC 380-2016
- Addendum E, House Size Index Adjustment Factors
- Addendum G, Solid State (LED) Lighting
- Addendum K, Roof Solar Absorptance Test
- Addenda F, L and N DO not appear in the draft of 301-201x







Multifamily stuff in draft Std 301-2019

- Today's topic: What you'll want to study in draft Std 301-2019
- This is your MF homework during the comment period.
- After all, we want it to be workable!
- Note this Standard also serves as a spec document for what rating software tools must be able to do







New expanded Scope

Scope: Dwelling Units & Sleeping Units,

except hotels and motels. Not whole buildings with multiple units.*

- Townhomes
- Duplexes
- College dorms & Assisted Living
- Apt buildings
- Dwelling units in mixed commercial/residential

* Composite ERI for residential portions of a building is described in section 5.1.5.





Get your terminology right!

New definitions & refinements on old definitions

- -- So review them!
- Bedroom refinements for MF
- e.g., egress window not always realistic!
- Updated definitions on MF Qualifying Light Fixture Locations
- (FYI also new Tier definitions for efficient lighting)
- Dwelling-Unit Mechanical Ventilation
- refined Supply and Balanced definitions to ensure fresh air comes directly from outdoors











Compartmentalization Boundary is the outside surface of the Infiltration Volume.



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Definitions – on a roll!

The ONE Table

4.2. Energy Rating Reference Home and Rated Home Configuration

methods and techniques. 4.2.1. General Requirements. Except as specified by this Section, the Energy Rating Reference Home and the Rated Home shall be configured and analyzed using identical

shall be configured and analyzed as specified by Table 4.2.2(1). 4.2.2. Residence Specifications. The Energy Rating Reference Home and Rated Home

Table 4.2.2(1) Spec	ifications for the Energy Rating Re	ference and Rated Homes
Building Component	Energy Rating Reference Home	Rated Home
Above-grade walls:	Type: wood frame	Same as Rated Home
	Gross Area: same as Rated Home	Same as Rated Home
	U-Factor: from Table 4.2.2(2)	Same as Rated Home
	Solar Absorptance $= 0.75$	Same as Rated Home
	Emittance = 0.90	Same as Rated Home
Conditioned basement	Type: same as Rated Home	Same as Rated Home
walls:	Gross Area: same as Rated Home	Same as Rated Home
	U-Factor: from Table 4.2.2(2)	Same as Rated Home
	with the insulation layer on the	



Floors over

Type: wood frame

Same as Rated Home

interior side of walls





Deep dive: MF and Air Exchange

Air Exchange Rate Nate Rate Rate Rate Rate Necessary to Dwelling-Unit Ventilation ra	Energy Ratin	from Table 4.2.2(1) Spe
(age Area (SLA) ^(d) = Iming no energy plemented as achieve the required Mechanical te. ^{(f), (g)}	g Reference Home	ecifications for the Ener
 In accordance with Standard ANSI/RESNET/ICC 380, obtain airtightness test results for: Building enclosure (for Detached Dwelling Units) Compartmentalization Boundary (for Attached Dwelling Units). For Attached Dwelling Units with airtightness test results ≤ 0.125 cfm50 	Rated Home	gy Rating Reference and Rated Homes



area that bounds the Infiltration Volume.





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Deep dive: MF and Air Exchange

from Table 4.2.2(1)

Air Exchange Rate (continued)

Rated Home

Compartmentalization Boundary (for Attached Dwelling Units).

For Attached Dwelling Units with airtightness test results ≤ 0.125 cfm50 per ft² of Compartmentalization Boundary, the test results shall be modified by reduction factor A_{ext} ^(r).

For residences without



 (r) Reduction factor A_{ext} (used only for Attached Dwelling Units) shall be the ratio of exterior envelope surface area to Compartmentalization Boundary.

(Informative Note) Does not include the area where attached to garages or other Dwelling Units.





from Table 4.2. Air Exchange Rate (continued)	Deeper
Rated Home Rated Home factor A _{ext} (^r). For residences without Dwelling-Unit Mechanical Ventilation systems, or which draw excessive ventilation air from adjacent Dwelling Units, (^u) the Infiltration rate ^(e) shall be as determined above, but not less than 0.30 air exchanges per hour (ach). For residences with	dive: MF and Ai
(u) For Attached Dwelling Units, for the purpose of determining air exchange rate in the Rated Home, an Exhaust System (unpaired with one or more Supply Systems) shall be considered as drawing excessive ventilation air from adjacent Dwelling Units, if the value of reduction factor A _{ext} < 0.5.	r Exchange







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from Table 4.2.2(1)	
	Rated Home
Air Exchange	than 0.30 air exchanges per hour (ach).
Rate (continued)	For residences with Dwelling-Unit Mechanical Ventilation systems, the total air exchange rate shall be the Infiltration rate ^(e) in combination ^(g) with the time-averaged Dwelling-Unit Mechanical Ventilation system rate, ^{(f), (t)} which shall not be less than Qtot = $0.03 \times CFA + 7.5 \times (Nbr+1)$ cfm
Insights from endnc Qfan = Qtot – • [infiltr	nte (f) : ⊅ (Qinf × Aext) ation credit]
Φ =1 for Baland Exception: A v	ced Ventilation Systems and Q <i>inf / Qtot</i> otherwise <i>[unbalanced ventilation is less effective !!]</i> rentilation fan is not required when Q _{fan} is less than 10 cfm (5 L/s)







Deepest point: MF and Air Exchange

<i>More insights frc</i> Where th ventilation ri <i>compliance</i> air is pre-co shared ven multiple Dw make corre shared preco energy con	Air Exchange Rate		from Table 4.2.2
om endnote (f) : he Rated Home mechanical ate [is adjusted into], and where the ventilation onditioned as part of a tilation system shared by elling Units, the software shall sponding adjustments to the conditioning equipment sumption assigned to the	the time-averaged Dwelling rate, ^{(f), (t)} which shall not be le Qtot = 0.03 x CFA + 7.5 x (Nb	Rated Home	(1)
	g-Unit Mechanical Ventilation system ss than or+1) cfm		



Rated Home



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the time-averaged Dwelling-Unit Mechanical Ventilation system re, ^{(f), (I)} which shall not be less than of = 0.03 x CFA + 7.5 x (Nbr+1) cfm inical ventilation g shall be used to n airflows in the entilation supply mix of utdoor air, the airflow shall be t the percentage of t side.	recirculated and c supply ventilation adjusted to reflection air that is from ou	Rated Home. 1. Where shared v systems provide a	Now, from endnote (<i>t</i>) : [For] a shared mecha system [] the following determine the ventilatio	Air Exchange rat Rate Qt	Ra	from Table 4.2.2(1)
nical Ventilation system	t the percentage of Itside.	rentilation supply	anical ventilation g shall be used to n airflows in the	the time-averaged Dwelling-Unit Mechai te, ^{(f),} ^(t) which shall not be less than ot = 0.03 x CFA + 7.5 x (Nbr+1) cfm	ated Home	
	uilding) (Dwelling Unit)	What % is outside air?		nical Ventilation system		







from Table 4.2.2(1) Air Exchange Rate .] the following sh. 3. Where the [combination o accordance with Systems, the ventilation rate	Rated Home the time-averaged Dwelling-Unit Mechanical Ventilation system rate. ^{(f), (f)} which shall not be less than Qtot = 0.03 x CFA + 7.5 x (Nbr+1) cfm <i>ndnote (f):</i> all be used to determine the ventilation airflows in the Rated Home.] Mechanical Ventilation system is a Balanced System or a f systems, the system airflows shall be analyzed separately, in 1 the previous steps. at does not explicitly model multiple, separate Supply and Exhaust system shall be modeled as a Balanced System, where the f the Rated Home is the sum of either the exhaust airflows
Air Exchange	Rated Home the time-averaged Dwelling-Unit Mechanical Ventilation system rate, ^{(f), (t)} which shall not be less than
continued, from e. [] the following sh	ndnote (t): all be used to determine the ventilation airflows in the Rated Home.
3. Where the [combination o accordance wit] Mechanical Ventilation system is a Balanced System or a f systems , the system airflows shall be analyzed separately , in r the previous steps.
For software the Systems, the ventilation rate measured in the unit, whichever	at does not explicitly model multiple, separate Supply and Exhaust system shall be modeled as a Balanced System, where the of the Rated Home is the sum of either the exhaust airflows e Dwelling Unit or the sum of the supply airflows measured in the is greater .
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Fan Energy for MechVent

	Dwelling- Unit Mechanical Ventilation fan energy :		from Table 4.
	None, except where a mechanical ventilation system is specified by the Rated Home and supply only or exhaust-only 0.35*fanCFM*8.76 kWh/y balanced without energy recovery or a combination of Supply and Exhaust Systems 0.70*fanCFM*8.76 kWh/y balanced with energy recovery 1.00*fanCFM*8.76 kWh/y And where fanCFM is the minimum continuous Dwelling Unit Mechanical Ventilation system fan flow rate ^(f) of the Rated Home ^(y) .	Energy Rating Reference Home	2.2(1) Specifications for the Energy Rating Re
,	Same as Rated Home (*) (x) Where the ventilation system serve[s] the ventilation needs of more than one Dwelling Unit, the Rated Home KWh/y fan energy shall be calculated as a proportion of the entire system fan energy, using the system airflow, ventilation type, fan run time and the rated fan power ²⁶ of the shared system [details]	Rated Home	eference and Rated Homes







Htg/Clg interacts w MF MechVent







Ducts !! Should we test?





Ducts – (shallow dive)



Attached Dwelling Units. Measurements of duct leakage to outside shall not be used for Ratings of or air handler are located outside of Conditioned Space Volume. testing is also required for any Dwelling Unit where any portion of the ducts

small part of the total energy consumption, and duct leakage in turn is a small (Informative Note) In most Attached Dwelling Units, space conditioning is a testing only where it is likely to contribute significantly to the ERI. part of the space conditioning load. This standard requires duct leakage





Ducts (dive over)

(w) For Attached Dy total duct leakage re in [] Conditioned \$	Thermal distribution systems		from Table 4.2.2(1)	
velling Units on sults by counting Space Volume,			Specifications for	
nly:calculate the energy impact of ing leakage only from duct surface area that is not	shall test total duct leakage; [] Home ^(w)	Rated Home	for the Energy Rating Reference and Rated Homes	

air handlers; however, the sum shall not exceed the measured duct leakage from the airflow for air handlers less than 5 years old and 5% of the supply airflow for all other Space Volume, the air handler contribution shall be a minimum of 2% of the supply plus a contribution from the associated air handler if located outside the Rated Home Conditioned Space Volume. When located outside the Rated Home Conditioned



entire duct system.





"Internal Gains" (i.e. waste heat) from appliances located nor Reference homes. beyond the dwelling unit are not counted in the Rated







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Now we're in (MF) hot water

Do collect data from the water heater serving a shared laundry. It must be included separately in the rating. (Section 4.2.2.5.2.11)











MinRated Features must be modeled!

Laundry refinements for MF:

- If washer or dryer not in Dwelling Unit, assess the equipment in the nearest shared laundry on-site.
- Use the worst equip present (worst dryer CEF, worst washer LER)
- If ratio of Dwelling Units to shared dryers exceeds 8:1, Rated Home shall use the Reference Home dryer.
- Likewise for clothes washers.





Yes, even dishwashers

Dishwasher refinements for MF:

- If the Dwelling Unit has no dishwasher,
- assess the nearest shared kitchen in the building, if available for daily use by the Dwelling Unit occupants







Service Hot Water Distribution - MF refinements





Home.







What about the shared central space conditioning equip?



- **Boiler loops**
- Chillers
- **Cooling Towers**



and water loop HPs, radiators, fan coils? See sections 4.4.4 – 4.4.7



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Comment period is near Std 301-2019

- It is not perfect.
- It will never be perfect. But is it good enough?
- Can you write something that will work better?
- Please, do! Submit it in the comment period
- This is your MF homework during the comment period.
- Make sure you think this is workable!





Wrap-up

- Public comment period for PDS-01 301-201x started March 2 and ends Monday, April 16.
- If all goes well*, it could be available for use in HERS ratings/software by January 2020 and part of 2021* IECC
- Scope covers dwelling/sleeping units in any height building
- Central systems handled much better IN the software
- Better addresses MF situations (shared laundry, solar, etc)
- It will include all approved addenda to date (DHW, IAF, LED lighting, Appendices on Insulation and Inspections)
- Public comment period for PDS-02 380-201x and the two Appendices above should start in April
- TBD: MF Rater Training, credentials, MF Provider, etc







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Q&A