**Comment/Explanation\*:***Include your justification for your proposed change to the draft standard below.*
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The change from Graded Insulation Installation to “Properly Installed” and “Not Properly Installed” should not be made. These generic terms leave too much room for inconsistent subjectivity versus the current Grading methodology which provides more effective qualification assessment and determination based on expertise, training and effective observation made by RESNET Certified professionals.

**Proposed Change to the Draft Standard\***
*Use “strikethrough” and “underline” formatting to indicate all proposed changes. Changes must be shown with “hard-formatting” strikethrough and underline, not “track changes”.*\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**~~Draft PDS-01~~**

**~~RESNET/ICC 301-2022 Addendum D-202x~~**

**~~Appendix A Insulation Installation Grading Update~~**

***~~Modify Standard 301-2022 Section 3.2 as follows:~~***

**~~3.2. Definitions.~~**

***~~Air Barrier~~*** *~~-~~*~~One or more materials joined together in a continuous manner to restrict or prevent the passage of air through the Building Thermal Envelope~~~~and its assemblies.~~

***~~Assessed R-Value~~***~~– The R-Value of the installed insulation excluding the impacts of Properly Installed and Not Properly Installed insulation grading.~~~~1~~

***~~Building Thermal Envelope~~*** ~~- Building element assemblies that enclose conditioned space or provide a boundary between conditioned space and exempt or unconditioned space.~~

***~~Continuous Air Barrier~~***~~- A combination of materials and assemblies that restrict or prevent the passage of air through the Building Thermal Envelope and its assemblies.~~

***~~Continuous Insulation (ci)~~*** *~~-~~*~~Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior, or is integral to any opaque surface, of the Building~~~~Thermal Envelope.~~

***~~Infiltration Volume~~***~~20~~ ~~– The sum of the following spaces of the subject Dwelling Unit:~~

* ~~The Conditioned Space Volume, excluding any Attics, basements, crawlspaces, and adjacent mechanical closets.~~
* ~~The Conditioned Space Volume and Unconditioned Space Volume of the following adjacent spaces if included~~~~21~~ ~~during the airtightness measurement of the continuity of the enclosure’s air barrier system: Attics, crawlspaces and the full depth of their floor assemblies above, basements and the full depth of their floor assemblies above, and adjacent mechanical closets and the full width of their wall assemblies between them and the subject Dwelling Unit.~~

***~~Not Properly Installed~~**~~(NPI)~~***~~- Insulation that has been evaluated in accordance with Appendix A and does not meet the requirements for Properly Installed insulation, without regard to the amount required to meet the design intent.~~

***~~Properly Installed~~**~~(PI)~~***~~- Insulation that has been evaluated as Properly Installed in accordance with Appendix A, without regard to the amount required to meet the design intent.~~

***~~Modify Section 3.3 as follows:~~***

**~~3.3 Acronyms.~~**

***~~NPI –~~*** ~~Not Properly Installed~~

***~~PI –~~*** ~~Properly Installed~~

***~~Modify Standard 301-2022 Table 4.2.2(1) as follows:~~***

**~~Table 4.2.2(1) Specifications for the Energy Rating Reference and Rated Homes~~**

|  |  |  |
| --- | --- | --- |
| **~~Building Component~~**  | **~~Energy Rating Reference~~**  |  **~~Rated Home~~** |
| ~~Above-grade walls~~~~separating Conditioned~~~~Space Volume from~~~~outdoor environment or~~~~Unconditioned Space~~~~Volume~~ | ~~Type: wood frame~~~~Gross Area: same as Rated Home~~~~U-Factor: from Table 4.2.2(2)~~~~Solar Absorptance = 0.75~~ | ~~Same as Rated Home~~~~Same as Rated Home~~~~Same as Rated Home~~~~a~~~~Values from Table 4.2.2(4)~~~~shall be used to determine~~~~Solar Absorptance, except~~~~where test data are provided~~~~for wall surface in accordance~~~~with ASTM C1549 or ASTM~~~~E903 using the ASTM G197~~~~air-mass 1.5 sun-facing global~~~~vertical solar spectral~~~~irradiance for the~~~~measurement of Solar~~~~Reflectance.33 The Solar~~~~Absorptance value is obtained~~~~by subtracting the measured~~~~Solar Reflectance value from~~~~the number one (Solar~~~~Absorptance = 1 – Solar~~~~Reflectance)~~~~Same as Rated Home~~ |
| ~~Above-grade walls~~~~separating Conditioned~~~~Space Volume from~~~~Unrated Heated Space,~~~~Multifamily Buffer~~~~Boundary, or Non-~~~~Freezing Space~~ | ~~Type: wood frame~~~~Gross Area: same as Rated Home~~~~U-Factor: 0.292 for IECC Climate~~~~Zones 1&2, 0.089 for IECC~~~~Climate Zones 3-8.~~~~Solar Absorptance = 0.75~~~~Emittance = 0.90~~ | ~~Same as Rated Home~~~~Same as Rated Home~~~~Same as Rated Home~~~~a~~~~Values from Table 4.2.2(4)~~~~shall be used to determine~~~~Solar Absorptance, except~~~~where test data are provided~~~~for wall surface in accordance~~~~with ANSI/CRRC S100.~~~~Same as Rated Home~~ |
| ~~Ceilings above~~~~Conditioned Space~~~~Volume and below an~~~~Attic, Unconditioned~~~~Space Volume, Non-~~~~Freezing Space, Unrated~~~~Heated Space, or~~~~Multifamily Buffer~~~~Boundary~~ | ~~Type: wood frame~~~~Gross Area: same as Rated Home~~~~ceiling area~~~~U-Factor: from Table 4.2.2(2)~~ | ~~Same as Rated Home~~~~Same as Rated Home~~~~Same as Rated Home~~~~a~~ |
| ~~Conditioned basement~~~~walls~~ | ~~Type: same as Rated Home~~~~Gross Area: same as Rated Home~~~~R-Value: from Table 4.2.2(2) with the insulation layer on the interior side of walls~~ | ~~Same as Rated Home~~~~Same as Rated Home~~~~Same as Rated Home~~~~a~~ |
| ~~Floors over~~~~Unconditioned Space~~~~Volume, Non-Freezing~~~~Space, Unrated Heated~~~~Space, or Multifamily~~~~Buffer Boundary~~ | ~~Type: wood frame~~~~Gross Area: same as Rated Home~~~~U-Factor: from Table 4.2.2(2)~~ | ~~Same as Rated Home~~~~Same as Rated Home~~~~Same as Rated Home~~~~a~~ |
| ~~Floors over outdoor~~~~environment~~ | ~~Type: wood frame~~~~Gross Area: same as Rated Home~~~~U-Factor: from Table 4.2.2(2)~~ | ~~Same as Rated Home~~~~Same as Rated Home~~~~Same as Rated Home~~~~a~~ |
| ~~Ceilings above~~~~Conditioned Space~~~~Volume and below an~~~~Attic, Unconditioned~~~~Space Volume, Non-~~~~Freezing Space, Unrated~~~~Heated Space, or~~~~Multifamily Buffer~~~~Boundary~~ | ~~Type: wood frame~~~~Gross Area: same as Rated Home~~~~ceiling area~~~~U-Factor: from Table 4.2.2(2)~~ | ~~Same as Rated Home~~~~Same as Rated Home~~~~Same as Rated Home~~~~a~~ |
|  |  |  |
| ~~Attics~~ | ~~Type: vented with aperture = 1ft2~~~~per 300 ft2 ceiling area~~~~Attic roof assemblies shall be~~~~uninsulated, while the ceiling~~~~below the Attic shall be~~~~insulated according to Table~~~~4.2.2(2)~~ | ~~Same as Rated Home~~~~Same as Rated Home~~~~a~~ |
| ~~Foundations~~ | ~~Type: same as Rated Home~~~~Gross Area: same as Rated Home~~~~U-Factor / R-Value: from Table~~~~4.2.2(2)~~ | ~~Same as Rated Home~~~~Same as Rated Home~~ ~~Same as Rated Home~~~~a~~ |
| ~~Crawlspaces~~ | ~~Type: vented with net free vent~~~~aperture = 1ft2 per 150 ft2 of~~~~crawlspace floor area.~~~~Crawlspace walls shall be~~~~uninsulated, while the floor~~~~above the crawlspace shall be~~~~insulated according to Table~~~~4.2.2(2) as a “Floor over~~~~Unconditioned Space~~~~Volume.” a~~~~U-Factor: from Table 4.2.2(2) for~~~~floors over Unconditioned~~~~Space Volume or outdoor~~~~environment.~~ | ~~Same as the Rated Home, but~~~~not less net free Ventilation~~~~area than the Reference~~~~Home unless an Approved~~~~ground cover in accordance~~~~with IRC 408.3.1 is used,~~~~in which case, the same net~~~~free Ventilation area as the~~~~Rated Home down to a~~~~minimum net free vent area~~~~of 1ft2 per 1,500 ft2 of~~~~crawlspace floor area.~~ ~~Same as Rated Home~~~~a~~ |

**~~Notes:~~**

~~a. The U-Factor for the building components in the Rated Home shall be calculated using the Assessed R-Value, in accordance with Appendix A and Appendix B. The impacts of insulation grading shall be included in the simulation, but not be included where reporting U-Factors of building components.~~

***~~Modify Standard 301-2022 Section 4.2.2.3 as follows:~~***

**~~4.2.2.3. Insulation Inspections~~**~~: All enclosure elements for the Rated Home shall have their insulation’s Aassessed R-Value determined in accordance with this Standard. first, and then Insulation shall be rated as Grade I, II, III or uninsulated shall be inspected to determine if the insulated assembly is uninsulated, Properly Installed, or Not Properly Installed in accordance with the on-site inspection procedures in Normative Appendix A.~~~~1~~

**~~4.2.2.3.1.~~** ~~The insulation of in the Energy Rating Reference Home enclosure elements shall be modeled as Grade I Properly Installed. The insulation elements of the Rated Home shall either be inspected according to procedures in accordance with Normative Appendix B and evaluated in accordance with Normative Appendix A. or if Where insulation is confirmed to be present but not fully inspected, the insulation shall be modeled as Grade III Not Properly Installed and shall be recorded as “not inspected” in the rating documentation.~~

~~Exceptions:~~

1. ~~Modular and manufactured housing using In-plant Primary Inspection Agency (IPIA) inspections for modular and manufactured housing shall be considered as an acceptable alternative for the Energy Rating inspection where the manufacturer of the home includes the on-site inspection procedures for insulation details and requirements in Appendix A and Appendix B in their Design Approval Primary Inspection Agency (DAPIA) packages, which are used by IPIAs for their factory inspections.~~

~~The Assessed R-Values for nonstructural materials or for Structural Insulated Panels (SIPs), Insulated Concrete Forms (ICFs) and other pre-manufactured assemblies when accompanied by supporting test data consistent with ASTM C177, ASTM C518, ASTM C1114, ASTM C1363 or ASTM C976.~~

~~Thermographic inspection is permitted to be used to determine that an assembly is insulated and achieves a Grade II Not Properly Installed rating if the person doing the inspection is an American Society of Nondestructive Testing (ASNT) Non-Destructive Test (NDT) Level III thermographer or a licensed engineer or if the person doing the inspection is working under the direction of an ASNT NDT Level III thermographer or a licensed engineer. Thermographic inspection shall not be used to determine if an assembly achieves a Grade I Properly Installed rating.~~

**~~4.2.2.3.2. Insulation Assessment.~~**

**~~4.2.2.3.2.1~~** ~~Insulated surfaces categorized as “Grade I” Properly Installed shall be modeled with the Assessed R-Value that is determined in accordance with Appendix A.~~~~1~~~~such that the insulation R-Value is considered at its measured (for loose fill) or labeled including other adjustments,~~~~[[1]](#footnote-1)~~ ~~for the insulated surface area (not including framing or other structural materials which shall be accounted for separately).~~

**~~4.2.2.3.2.2~~** ~~Insulated surfaces categorized as “Grade II” shall be modeled such that there is no insulation R-Value for 2 percent of the insulated surface area and its measured or labeled value, including other adjustments,~~~~[[2]](#footnote-2)~~ ~~for the remainder of the insulated surface area (not including framing or other structural materials). Insulated surfaces categorized as “Grade III” Not Properly Installed shall be modeled with the Assessed R-value that is determined in accordance with Appendix A for 90% of the insulated surface area and such that there is no insulation R-Value for 5 10 percent of the insulated surface area.,~~~~3~~ ~~and its measured or labeled value, including other adjustments,~~~~[[3]](#footnote-3)~~ ~~for the remainder of the insulated surface area (not including framing or other structural materials).~~

~~Areas of an assembly shall not be modeled separately solely based upon insulation grading. Where an insulated surface is categorized as Not Properly Installed, all insulated surface area with the same Assessed R-value, orientation, floor level, and insulation material shall be categorized as Not Properly Installed.~~

**~~4.2.2.3.2.3~~** ~~Insulated surfaces categorized as uninsulated shall be modeled with an R-Value of R-0. Insulation grading shall not be applied to enclosure elements that are categorized as uninsulated.~~

**~~4.2.2.3.2.4~~** ~~Other building assembly materials including framing, sheathing and air films, shall be assigned aged or settled R-Vvalues according to the ASHRAE~~ *~~Handbook of Fundamentals~~*~~. In addition, the following accepted conventions shall be used in modeling Rated Home insulation enclosures:~~

1. ~~Insulated wood-framed enclosure elements shall be evaluated and modeled such that framing members and cavities are treated as separate surface areas. Cavity insulation shall be modeled as contributing only to the thermal performance of the cavity surface area. Continuous insulation shall be modeled as contributing to the thermal performance of the cavity and framing member surface areas combined, or the total assembly area covered by the continuous insulation. The framing and cavity paths shall also include the R-Value of other building materials covering the interior and exterior sides of the assembly. Enclosure elements shall not be modeled using the sum of Assessed R-Values of continuous and cavity insulation materials.~~~~3~~ ~~Insulation that does not cover framing members shall not be modeled as if it covers the framing. Insulated surfaces that have continuous insulation, including rigid foam, fibrous batt, loose fill, sprayed insulation or insulated siding, covering the framing members shall be Assessed and modeled according to Section 4.2.2.3 and combined with the cavity insulation, framing and other materials to determine the overall assembly R-Value.~~

~~The base R-Value of fFibrous batt insulation that is compressed to less than its full rated thickness in a completely enclosed cavity shall be evaluated assessed according to the manufacturer’s documentation. In the absence of such documentation, use R-Value correction factor (CF) for Compressed Batt or Blanket from ACCA Manual J, 8th edition, Appendix 4. as described in Appendix A Section A1.1 and modeled with an Adjusted Performance R-Value.~~

~~Areas of an assembly having different insulation types, orientation, or R-Value (including uninsulated areas in excess of 5 percent of any otherwise insulated building component) shall be modeled separately with the applicable R-Value, orientation, and assembly areas associated with each different insulation situation.~~

~~The overall thermal properties of steel-framed walls, ceilings and floors shall be calculated in accordance with the modified zone method specified by Chapter 27, ASHRAE~~ *~~Handbook of Fundamentals~~* ~~or tested in accordance with ASTM Standard C1363. Modification of test results to add or subtract R-Values to the tested assembly that reflect differences between the tested assembly and proposed assemblies is authorized when such differences are continuous and occur outside of the cavity.~~

1. ~~(Normative Note) The Assessed R-Value is the R-Value entered into the energy model before grading of the insulation occurs. The Assessed R-Value shall be determined by the manufacturer label, installer certification (such~~ ~~as the 2021 IECC, where an insulation installer has provided a certificate complying with Section R303.1.1) or based on measured thickness and manufacturer listed R-Value per unit thickness. The Assessed R-Value shall include the impacts of compression, aging, and settling.~~

~~(Informative Note) Such as compression and cavity fill versus continuous.~~ [↑](#footnote-ref-1)
2. (Informative Note) Such as compression and cavity fill versus continuous.

3 (Normative Note) The Assessed R-value shall include the installed insulation only and shall not include framing or other structural materials. [↑](#footnote-ref-2)
3. ~~(Informative Note) Such as compression and cavity fill versus continuous.~~ [↑](#footnote-ref-3)