



Setting the Standards for
Home Energy Efficiency

Standard Revision

MINHERS Addendum 42 Adoption of Standards ANSI/RESNET/ICC 301-2019 and ANSI/RESNET/ICC 380-2019

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Proponent:	Standard Development Committee 300
Organization:	RESNET

Purpose:

Addendum 42 adopts the second editions of Standard ANSI/RESNET/ICC 301-2019 and ANSI/RESNET/ICC 380-2019. It also amends sections of the MINHERS chapters to implement new requirements of the Standards for the RESNET HERS and to remove sections and appendices that have been moved into Standard 301-2019, e.g. Appendix A, On-site Inspection Procedures and many definitions of Appendix B.

Amendment:

Revise the Sections of the MINHERS as follows

102.1 Minimum Standards for Rating Quality Assurance (QA) Provider Accreditation

102.1.4.2 Field verification of rated features of all homes in compliance with Chapter 3 and standard ANSI/RESNET/ICC 301, Appendix B, Appendix A ~~Appendix A~~ ~~On-Site Inspection Procedures for Minimum Rated Features of these Standards.~~

102.1.4.10.1.1.7 Rating Type for the home (~~confirmed~~ Confirmed, Threshold or Ssampled)

102.1.4.10.1.1.8 Home Type (single-family, duplex, low-rise Multi-family)

102.1.4.12 All QA Providers shall collect and register the Energy Simulation File for each home rated (~~C~~confirmed, Threshold or S~~sampled~~) by each Certified Rater with RESNET using the RESNET Buildings Registry. The QA Provider will register ratings and maintain this Registry in accordance with the policies and procedures established by RESNET related to the RESNET Buildings Registry.

102.1.4.13 Site data collection manual. All QA Providers shall provide Raters with a manual containing procedures for the on-site collection of data that at a minimum shall include the on-site inspection procedures for minimum rated features for new and existing homes provided in ~~Appendix A – On-Site~~ standard ANSI/RESNET/ICC 301, Appendix B, Inspection Procedures for Minimum Rated Features.

206.2 Certification

Prior to issuing a candidate's certification, a RESNET Accredited Rating Quality Assurance Provider shall confirm that the candidate has completed at a minimum, all of the following tasks appropriate to their desired certification within a 12-month period (unless otherwise indicated). Only RESNET Accredited Rating Quality Assurance Providers may certify candidates. Rating Providers may require candidates have successfully completed additional instruction beyond these requirements as needed to address their specific program, climate, software, or administrative requirements.

206.2.1 Home Energy Survey Professional (HESP)

206.2.1.1 Complete the national HESP Exam with a minimum (passing) score to be determined by RESNET.

206.2.2 Rating Field Inspector (RFI)

206.2.2.1 Pass the following RESNET Tests:

206.2.2.1.1 The RESNET Combustion Appliance Test

206.2.2.1.2 RESNET approved graded field evaluation

206.2.2.1.2.1 The graded field evaluation shall performed under the observation of a Candidate Field Assessor.

206.2.2.2 Complete at least three mentored rating field inspections observed by a certified HERS rater or a RESNET Candidate Field Assessor. The certified HERS Rater or RESNET Candidate Field Assessor shall use the RESNET graded field evaluation to document the results of mentored inspections. The mentored Rating Field Inspections shall comprise at a minimum the following tasks.

206.2.2.2.1 Use pressure differential diagnostics to identify intermediate buffer zones including (but not limited to) attics, garages, or crawlspaces.

206.2.2.2.2 Identify insulation defects and account for them in energy analysis tool inputs.

206.2.2.2.3 Identify insulation types, thickness, and alignment with air barriers.

206.2.2.2.4 Measure pressure differences across the Compartmentalization Boundary ~~building envelope~~ imposed by the operation of the home's equipment.

206.2.2.2.5 Perform envelope leakage testing in accordance with the airtightness testing protocols contained in ~~ANSI/RESNET/ICC 380-2016~~ ANSI/RESNET/ICC 380 .

206.2.2.2.6 Perform duct leakage testing in accordance with the duct testing protocols contained in ANSI/RESNET/ICC 380 ~~ANSI/RESNET/ICC 380-2016~~ and interpret results.

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206.2.2.2.7 Identify room and zone pressure imbalances caused by lack of ducted return air or pressure relief mechanisms such as transfer grilles or jumper ducts.

206.2.2.2.8 Perform CAZ, spillage, and CO testing in accordance with Carbon Monoxide (CO) Test and Depressurization Test for the Combustion Appliance Zone (CAZ) protocols contained in ANSI/ACCA 12 QH, Appendix A, Sections A4 and A5.

206.2.2.3 RFI's shall not complete independent field testing and inspections until they have satisfactorily completed the requisite three mentored rating field inspections per 206.2.2.2 and pass the RESNET graded field evaluation.

206.2.2.4 After successfully completing the mentored rating field inspections and passing the RESNET graded field evaluation, RFI's may be permitted to conduct all rating tasks contained under ANSI/RESNET/ICC 301 Appendix AB–, On-Site Inspection Procedures for Minimum Rated Features without having a certified Rater on site.”

206.2.3 Home Energy Rater (HERS Rater)

206.2.3.1 Successfully complete a Rater training course provided through a RESNET Accredited Training Provider that meets the minimum standards as defined in Section 202 - Accredited Training Providers.

206.2.3.2 Complete the following National RESNET HERS series of tests with the minimum (passing) scores to be determined by RESNET:

206.2.3.2.1 Pass the national HERS Rater Test(s)

206.2.3.2.2 The RESNET Combustion Appliance Simulation Tests

206.2.3.2.3 RESNET Rater Simulation Practical Test

206.2.3.3 After passing the all of the RESNET tests, but prior to being certified, the candidate shall complete five probationary ratings with a Rating Quality Assurance Provider overseen by a RESNET certified Candidate Field Assessor. At least three of the five probationary ratings shall be accomplished using field verification of all rated features of the home in accordance with ANSI/RESNET/ICC 380~~ANSI/RESNET/ICC 380-2016~~ and shall be completed in the presence of a RESNET Certified Field Assessor, at least one of which shall be completed one-on-one. Probationary ratings shall not be considered Confirmed Ratings.

206.2.3.4 A HERS Rater Candidate that does not complete, to the satisfaction of a Quality Assurance Provider, a minimum of three (3) of the five (5) required probationary ratings within fifteen (15) months of passing the National RESNET HERS series of tests as defined in 205.2.3.1, or otherwise does not achieve certification within the allowed fifteen month timeframe, must at a minimum, complete the original requirements and do the following in order to maintain eligibility for certification:

206.2.3.4.1 Pass the RESNET National Rater Test again; and

206.2.3.4.2 Complete three (3) additional probationary ratings. One of the three (3) additional probationary ratings shall be accomplished using field verification of all rated features of the home in accordance with Section 303.8 and Chapter 8, with the exception that the work is not being performed by a currently Certified Rater and shall be completed in the presence of a RESNET certified Candidate Field Assessor. Probationary ratings shall not be considered Confirmed Ratings.

208 Capabilities

Certified individuals shall have certain capabilities to perform the work required under their certification. The ~~capabilities for each certification categories-category~~ listed in this section are contained in [Chapter 3, Standard ANSI/RESNET/ICC 380](#)~~ANSI/RESNET/ICC 380-2016~~, and [Standard ANSI/RESNET/ICC 301 Appendix ~~4-On-Site~~B, Inspection Procedures for Minimum Rated Features](#). Certification candidates shall demonstrate proficiency at these capabilities through successful completion of certification requirements specified in [See Section 206 Certification Candidates](#). Training providers should ensure that their curricula effectively cover these items.

208.2 Rating Field Inspector (RFI)

A Rating Field Inspector is permitted to conduct all tasks contained within [Appendix A-On-Site-Inspection Procedures for Minimum Rated Features](#)~~ANSI/RESNET/ICC 301 Appendix B, Inspection Procedures for Minimum Rated Features~~. A Certified Rating Field Inspector shall have proficiency at the capabilities of a HESP in addition to the following items.

208.2.1 General

208.2.1.1 Use field inspection forms to identify and document the minimum rated features of the Reference Home and Rated Home in accordance with the requirements of [ANSI/RESNET/ICC 301-2014](#) – Energy Rating Reference Home and Rated Home Configuration and ~~MINHERS-Appendix A-On-Site-Inspection Procedures for Minimum Rated Features~~[ANSI/RESNET/ICC 301 Appendix B, Inspection Procedures for Minimum Rated Features](#).

208.2.1.2 Identify potential problems with the building such as health and safety concerns, building durability issues, potential comfort problems, and possible elevated energy use.

208.2.1.3 Identify basic home construction types and the ramifications of these for energy usage.

208.2.2 Determining Conditioned Space Volume

208.2.2.1 Determine the Conditioned Space Volume as defined in Appendix B.

208.2.3 Health and Safety

208.2.3.1 Identify problems related to poor indoor air quality (IAQ), building durability, and human comfort.

208.2.3.2 Identify potential presence of mold and potential causes.

208.2.4 Moisture Principles and Properties

208.2.4.1 Identify potential or existing moisture issues (bulk water intrusion, capillary action, air transport, vapor diffusion).

208.2.5 Measuring Building Components

208.2.5.1 Use construction documents such as building drawings and specification sheets, or actual measured building dimensions to produce a scaled and dimensioned sketch of a home.

208.2.6 Collecting Field Data (including photo documentation)

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208.2.6.1 Determine building orientation.

208.2.6.2 Measure window overhang lengths, heights, and distances from top and bottom of windows.

208.2.6.3 Determine roof slopes, gable heights, etc.

208.2.6.4 Calculate gross and net areas and volumes.

208.2.7 Insulation

208.2.7.1 Identify insulation types, thickness measurements, common usage locations, and alignment with air barriers.

208.2.7.2 Identify insulation defects, and grading (I, II, III).

208.2.8 Building Foundations

208.2.8.1 Identify type as crawl space, basement, or slab.

208.2.8.2 Identify ventilation system types.

208.2.8.3 Identify location, type, and R-value of insulation systems.

208.2.9 Framed Floors

208.2.9.1 Determine if framed floors are exposed to Conditioned Space Volume, Unconditioned Space Volume, or the outdoors.

208.2.9.2 Determine floor system type and frequency of framing members.

208.2.9.3 Determine insulation thickness, type, and grade (I, II, or III).

208.2.10 Slab-on-Grade

208.2.10.1 Identify slab as covered or exposed.

208.2.11 Above Grade Walls

208.2.11.1 Determine if walls are exposed to Conditioned Space Volume, Unconditioned Space Volume, or outdoors.

208.2.11.2 Determine construction type, thickness, and exterior color.

208.2.12 Windows and Doors

208.2.12.1 Identify window labels, framing types and materials, U-factors, reflective and low-e films and coatings, shading and overhangs, and orientation.

208.2.12.2 Identify exterior door types, insulation, and orientation.

208.2.12.3 Identify glass-area of exterior doors and windows.

208.2.13 Heating and Cooling Systems

208.2.13.1 Determine equipment efficiencies using equipment data (make, model, nameplate data), AHRI or other current accepted guides, or age-based defaults.

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208.2.13.2 Identify space-conditioning systems as active or passive.

208.2.13.3 Identify heating system properties: fuel type, burner type, venting type, distribution type, and efficiency.

208.2.13.4 Identify Ground-source heat pumps, air-source heat pumps, and air conditioning systems.

208.2.13.5 Identify ductless systems (hydronic, steam, electric).

208.2.13.6 Identify combo systems.

208.2.13.7 Identify solar thermal systems.

208.2.13.8 Identify control types (standard thermostats, programmable thermostats, multi-zone controls).

208.2.13.9 Identify sizing and design issues, control types, and their impacts on energy use and humidity control.

208.2.13.10 Identify summer and winter design temperatures.

208.2.13.11 Identify cooling and heating system design trade-offs.

208.2.14 Gas Leakage Testing

208.2.14.1 Identify gas leaks using combustible gas sensing equipment.

208.2.15 CAZ Testing

208.2.15.1 Perform CAZ depressurization, spillage, and CO testing in accordance with Carbon Monoxide (CO) Test and Depressurization Test for the Combustion Appliance Zone (CAZ) protocols contained in ANSI/ACCA 12 QH, Appendix A, Sections A4 and A5.

208.2.15.2 Identify room and zone pressure imbalances caused by lack of ducted return air or pressure relief mechanisms such as transfer grilles or jumper ducts.

208.2.15.3 Identify gas leaks using combustible gas sensing equipment. If a leak is found, recommend that a certified technician repair the leak.

208.2.16 Air Leakage

208.2.16.1 Identify air leakage mechanisms and drivers, energy and comfort implications, and health and safety issues.

208.2.16.2 Perform single-point and multi-point ~~building envelope leakage~~ airtightness testing in accordance with the airtightness testing protocols contained in [ANSI/RESNET/ICC 380-2016](#).

208.2.16.3 Identify potential air sealing using zonal pressure differentials and measurement techniques.

208.2.16.4 Measure pressure differences across the Compartmentalization Boundary ~~building envelope~~ imposed by the operation of the home's equipment.

208.2.17 Conditioned Air Distribution Systems

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208.2.17.1 Identify impacts of designed and imposed flaws (closed interior doors, blocked registers and grilles, air handler filters, etc).

208.2.17.2 Identify duct supply and return types (flexible, rigid metal, building chase, insulated panels) and locations with respect to thermal and air barriers.

208.2.17.3 Identify room and zone pressure imbalances caused by lack of ducted return air or pressure relief mechanisms such as transfer grilles or jumper ducts.

208.2.17.4 Perform duct leakage testing in accordance with the duct testing protocols contained in [ANSI/RESNET/ICC 380-2016](#) and recommend sealing as needed based on test results.

208.2.17.5 Determine need for duct insulation in Unconditioned Space Volumes and specify thickness of retrofit insulation if needed.

208.2.18 Ventilation

208.2.18.1 Identify fresh air ventilation from supply, exhaust and balanced flow systems.

208.2.18.2 Identify heat-recovery ventilation (HRV) and energy-recovery ventilation (ERV) systems.

208.2.18.3 Determine HRV or ERV efficiency, fan power and duty cycle characteristics.

208.3 Home Energy Rating System Rater (HERS Rater)

A Certified Home Energy Rater shall have proficiency at the knowledge and abilities of a HESP and a Rating Field Inspector in addition to the following.

208.3.1 General

208.3.1.1 Understand and be familiar with local climate conditions, housing stock, and climate-specific practices.

208.3.1.2 Understand local utility pricing structures (flat vs. tiered rates, net-metering regulations) and sources for reliable utility information.

208.3.1.3 Prepare a detailed work scope.

208.3.1.4 Develop field inspection forms.

208.3.1.5 Identify major U.S. climate zones and energy consumption impacts of local climate zone.

208.3.2 RESNET Rating System

208.3.2.1 Communicate the business aspects of being a RESNET HERS Rater.

[208.3.2.2 Maintain current knowledge of the HERS Rating method using the Reference Home as defined in ANSI/RESNET/ICC 301-2014.](#)

208.3.2.3 Conduct both projected and confirmed building simulation and performance analysis to provide HERS Ratings in accordance with the requirements in [Chapter 3– and Standards ANSI/RESNET/ICC 301](#) and [ANSI/RESNET/ICC 380-2016](#).

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208.3.2.4 Use RESNET approved energy analysis software capable of producing a HERS Index, data entry procedures, reporting, and analysis of results.

208.3.2.5 Calculate HERS Score computation using the Normalized Modified Loads Rating Method.

208.3.2.6 Communicate the benefits of the Home Energy Rating System to homeowners, builders, finance and real estate agents and cultivate partnerships between those individuals.

208.3.2.7 Assist and educate customers and builders with:

208.3.2.7.1 Home Energy Surveys and Home Energy Ratings.

208.3.2.7.2 Cost effectiveness of energy efficient building design.

208.3.2.7.3 Quality assurance.

208.3.2.7.4 Marketing of HERS Rated Homes.

208.3.2.7.5 Qualifications for programs such as ENERGY STAR®.

208.3.2.7.6 Real estate financing, economic terminology, and energy code compliance.

208.3.2.7.7 Financing advantages of Energy Efficient Mortgages (EEM) and Energy Improvement Mortgages (EIM).

208.3.2.7.8 Adding appraisal value through energy improvements.

208.3.2.8 Provide excellent customer service in an ethical and fully disclosed manner.

208.3.2.9 Produce reports which meet minimum reporting requirements and improvement analysis.

208.3.2.10 Maintain standard operating procedures and office administration.

208.3.2.11 Maintain knowledge of current technical guidelines.

210 Normative References

ANSI/ACCA 12 QH-2014, Home Evaluation and Performance Improvement

ANSI/RESNET/ICC 301-2014(Republished January 2016)2019, “Standard for the Calculation and Labeling of the Energy Performance of ~~Low-Rise Residential Buildings~~Dwelling and Sleeping Units using an Energy Rating Index.”, including addenda and normative appendices.

ANSI/RESNET/ICC 380-20162019, “Standard for Testing Airtightness of Building, Dwelling Unit and Sleeping Unit Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems”, including addenda and normative appendices.

301 General Provisions

301.1 Purpose

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The provisions of this Standard establish residential energy rating and labeling standards, consistent with the provisions of the Energy Policy Act 1992 that any provider of home energy ratings may follow to produce uniform energy ratings for Residential Buildings.

301.2 Scope

These Standards apply to existing or proposed, site-constructed or manufactured, ~~one and two-family Dwellings and to~~ Dwelling Units and Sleeping Units in Residential and Commercial Buildings, ~~excepting hotels and motels not over three Stories Above Grade Plane in height containing multiple Dwelling Units.~~

~~**Exception 1:** These Standards also apply to Dwelling Units in multi-family buildings four and five stories above grade that are certified through the EPA's ENERGY STAR certified homes program.~~

~~**Exception 2:** These Standards also apply to Townhouses and single family Dwellings four Stories Above Grade Plane in height.~~

301.3 Relationship to Other Standards.

This Standard is a companion to Standard MINHERS [Chapter 1](#), “National Accreditation Procedures for Home Energy Rating Systems”; Standard MINHERS [Chapter 2](#), “National Rater Training and Certifying Standard; Standard MINHERS [Chapter 6](#), “National Standard for Sampled Ratings”, and; Standard MINHERS [Chapter 9](#), “RESNET National Standard for Quality Assurance”.

302 Definitions

The following terms of section 302.1 through 302.5 have specific meanings as used in this Standard. In the event that definitions given here differ from definitions given elsewhere, including those given in [ANSI/RESNET/ICC 301–2014](#), the definitions given here shall govern.

302.1 Approved Rating Provider

Shall mean a RESNET-accredited Quality Assurance Provider who is listed in good standing in the National RESNET Registry.

302.2 Approved Software Rating Tool

Shall mean a RESNET-accredited HERS® Rating Tool that has been tested and approved in accordance with RESNET Publication 002 and that is listed in the RESNET National Registry of Accredited Rating Software Programs
http://www.resnet.us/professional/programs/energy_rating_software

302.3 Approved Tester

Shall mean a RESNET Rater or Rating Field Inspector (RFI) who has been certified by a RESNET-accredited Quality Assurance Provider and who is listed in good standing in the National RESNET Registry.

302.4 Certified Rater

Shall mean a RESNET Rater who has become qualified to conduct home energy ratings through certification by a RESNET-accredited Quality Assurance Provider and who is listed in good standing in the National RESNET Registry.

302.5 Approved IDR Review Authority

Shall mean the RESNET Standards Development Committee 300 (SDC 300).

303 Technical Requirements

303.1 Applicable Standards

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

~~**Exception 1:** RESNET Home Energy Ratings conducted on Dwelling Units in multi-family buildings four and five stories above grade that are certified through EPA’s ENERGY STAR-certified homes program shall comply with the provisions of ANSI/RESNET/ICC 301-2014, notwithstanding the limit on stories, and Sections 303.2 and 303.3.~~

~~**Exception 2:** RESNET Home Energy Ratings conducted on Townhouses and single-family Dwellings four Stories Above Grade Plane in height(e.g., four Story detached single family home, four Story duplex, four Story Townhouse) shall comply with the provisions of ANSI/RESNET/ICC 301-2014, notwithstanding the limit on stories, and Sections 303.2 and 303.3.~~

~~**Exception 3:** Where Whole House Mechanical Ventilation System airflow rate cannot be measured, the Infiltration rate in the Rated Home shall be no less than 0.3 ACH. To determine fan energy in the Rated Home, ventilation fan watts shall be based on the table below for the given system or the value observed in the Rated Home, for the highest airflow setting. Where needed to calculate fan watts, for systems other than Central Fan Integrated Supply (CFIS), the Whole House Mechanical Ventilation System rate shall be assumed to be equal to Qfan, as calculated in accordance with Section 4.1.2 of ASHRAE Standard 62.2. For CFIS systems, the cfm used to determine fan watts shall be the larger of 400 cfm per 12 kBtu/h cooling capacity or 240 cfm per 12 kBtu/h heating capacity.~~

Default Ventilation Fan Watts	
Equipment Type	W/cfm
–Exhaust ventilation fans	0.35
–Supply ventilation fans	0.35
–Balanced ventilation fans	0.70
–HRV/ERV fans	1.00

CFIS fans	0.50
Range hoods	0.70

303.2 ~~Sampled Ratings~~Rating Registration

All Confirmed, Threshold and Sampled ~~RESNET HERS~~ Ratings shall be registered with the National RESNET Registry in accordance with Sections [102.1.4.10](#) and [102.1.4.12](#).

303.3 HERS Rating Tools

All RESNET-accredited HERS Rating Tools shall prohibit printing of Confirmed, Threshold and Sampled HERS Ratings until such rating has been registered with the National RESNET Registry and a unique registration identification has been assigned. Said registration identification shall be prominently displayed on all printed HERS Rating reports.

304 Normative References

ANSI/RESNET/ICC 301-2014(~~Republished January 2016~~)2019, “Standard for the Calculation and Labeling of the Energy Performance of ~~Low-Rise Residential Buildings~~Dwelling and Sleeping Units using an Energy Rating Index.”, including addenda and normative appendices.

ANSI/RESNET/ICC 380-2019, “Standard for Testing Airtightness of Building, Dwelling Unit and Sleeping Unit Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems”, including addenda and normative appendices.

MINHERS- Mortgage Industry National Home Energy Rating Systems

RESNET MINHERS Chapter 1-~~2013~~, “National Accreditation Procedures for Home Energy Rating Systems” including addenda.

RESNET MINHERS Chapter 2-~~2013~~, “National Rater Training and Certifying Standard” including addenda.

RESNET MINHERS Chapter 6, “RESNET National Standard for Sampled Ratings”

RESNET MINHERS Chapter 9-~~2013~~, “RESNET National Standard for Quality Assurance” including addenda.

RESNET Publication 002-2017, “Procedures for Verification of RESNET Accredited HERS Software Tools”

~~(MINHERS Mortgage Industry National Home Energy Rating Standards)~~

~~ANSI/RESNET/ICC 380-2016, “Standard for Testing Airtightness of Building Enclosures, Airtightness of Heating and Cooling Air Distribution Systems, and Airflow of Mechanical Ventilation Systems”, including addenda and normative appendices.~~

~~ASHRAE Standard 62.2-2013, “Ventilation and Acceptable Indoor Air Quality inLow-Rise Residential Buildings”, ASHRAE, Atlanta, GA.~~

602.6 Application of Sampling

The application of the sampling controls in this standard are only required for those tests and inspections that are not conducted on every home. Sampling controls shall be conducted for any tests and inspections not conducted on every home, according to the field testing and inspection requirements of ~~Chapter 8~~ Standards ANSI/RESNET/ICC 301, Appendix B and ANSI/RESNET/ICC 380.

Chapter 8- **RESNET STANDARD FOR COMBUSTION SAFETY TESTING AND WORK SCOPE**

903.4.1.1 For each Rater, the Provider's QA Designee shall be responsible for an annual QA file review of the greater of one (1) home or ten percent (10%) of the Rater's annual total of homes for which Confirmed, Threshold or Sampled Ratings were provided. When determining the number of homes to review for a Rater, round up to the next whole number when the percentage calculation yields a decimal point, e.g. 101 homes x 10% = 10.1 means that 11 homes shall be reviewed.

903.4.1.3.3 For ~~of~~ each Confirmed Rating, confirm that the values entered into the Rating Software for all Minimum Rated Features are supported by actual on-site field-verified test data;

903.4.2.1 For each Rater, the Provider's QA Designee shall be responsible for an annual on-site QA field review of the greater of one (1) home or one percent (1%) of the Rater's annual total of homes for which Confirmed, Threshold or Sampled ratings and diagnostic testing services were provided. When determining the number of QA field reviews to complete for a Rater, round up to the next whole number when the percentage calculation yields a decimal point, e.g. 101 homes x 1% = 1.01 means that 2 QA field reviews shall be completed.

903.4.2.2 QA field reviews for Rating Field Inspectors (RFIs)

903.4.2.2.1 For Raters utilizing Rating Field Inspectors (RFI's), the QA Designee shall ensure that a QA field review is completed on the greater of one (1) home or one percent (1%) of each RFI's annual total of homes for which Confirmed, Threshold or Sampled ratings and diagnostic testing services were provided by the RFI. The RFI QA field reviews may fulfill all or a portion of the Rater's annual QA field review requirement.

903.4.2.5 As part of the QA field review of Confirmed Ratings, the QA Designee shall ensure that the minimum rated features of a rating are independently confirmed (i.e. confirmation of geometric characteristics, inspection of minimum rated features, and completion of any necessary performance testing) to determine whether the rating and/or diagnostic testing were accurately completed by the Rater, and determine whether information was completely collected and reported as required in Chapter 3 of these Standards.

ACCA - Air Conditioning Contractors of America (2800 Shirlington Road, Suite 300, Arlington, VA, 22206; tel: 703/575-4477; <http://www.acca.org>)

ACCA 4 QM - 2007 Maintenance of Residential HVAC Systems in One- and Two-Family Dwellings Less Than Three Stories

ACCA 5 QI -2010 HVAC Quality Installation Specification

ACCA 6 QR- 2007 Standard for Restoring the Cleanliness of HVAC Systems

ACCA 9 QIvp. 2011 HVAC Quality Installation Verification Protocols

ACCA 12 QH 201X Existing Home Evaluation and Performance Improvement

RESNET - Residential Energy Services Network (P.O. Box 4561, Oceanside, CA, 92052-4561; 1-800-836-7057; <http://www.resnet.us>)

Mortgage Industry National Home Energy Rating Standard

RESNET National Standard for Home Energy Audits

Rating and Home Energy Survey Ethics and Standards of Practice

RESNET Standards for Qualified Contractors and Builders

Appendix A- ON-SITE INSPECTION PROCEDURES FOR MINIMUM RATED FEATURES

See ANSI/RESNET/ICC 301-2019 Normative Appendix B for Inspection Procedures for Minimum Rated Features

Delete the content of Appendix A in its entirety and leave the heading with added reference.

Appendix B- Glossary of Terms

Abnormal

~~Some defect exists in the construction and operation of the building enclosure.~~

ACCA

[Air Conditioning Contractors of America](http://www.acca.org)

ACCA QA Program

A quality assurance recognition program for HVAC contractors, in which participants (1) attest that they have implemented written policies and procedures in the ANSI/ACCA 5 QI-2010 Standard to effect quality on a consistent basis in the field, (2) complete and submit a detailed HVAC system installation checklist, and (3) have specific elements of the installation validated by a 3rd party Rater for compliance to the ENERGY STAR® New Homes Program requirements. More information can be found at <http://www.acca.org/qa>

Accreditation Identification Number (AIN)

A unique accreditation number assigned to each Rating Quality Assurance Provider.

Accreditation Committee

A Standing Committee of the RESNET organization that is responsible for the review and approval of all Applications for Provider accreditation submitted to RESNET.

Accredited Rating Quality Assurance or QA Provider

A Rating Quality Assurance Provider accredited by RESNET in accordance with [Chapter 1](#) and [Chapter 9](#) of the RESNET Standards to certify and perform quality assurance of Raters.

Accredited Rater Training Provider or Accredited Training Provider or Training Provider or Rater Trainer

A Rater Training Provider accredited by RESNET in accordance with [Chapter 2](#) and [Chapter 9](#) of RESNET Standards to instruct individuals to become Raters certified by Accredited Rating Quality Assurance Providers. Only RESNET Accredited Rater Training Providers may offer rater instruction and set up the national rater tests.

Acrylic Adhesive Tape

~~Any tape composed of an acrylic nature used as a sealing material primarily for moisture-intrusion for house wraps, around windows, and to seal sheets of polyethylene covering the dirt on the floor of a crawl space or a basement~~

Additional Failure

When additional instances of initial failure(s) are identified in one or more of the other homes in the sample set being tested or inspected.

Air Barrier

Any solid material installed to control air leakage either into or out of the ~~building envelope~~Compartmentalization Boundary. The material used shall have an air permeability not to exceed 0.004 cubic feet per minute per square foot under a pressure differential of 0.3 in. water (1.57 psf) (0.02 L/s.m² @ 75 Pa.) when tested in accordance with ASTM E 2178-01.

Air Exfiltration

~~Air from the Conditioned Space Volume leaking outside of the thermal boundary of a structure.~~

Air-free Carbon Monoxide

~~A unit of measurement designed to compensate for the excess air to the burner and is only used to express CO levels in a flue gas sample as opposed to ambient air testing. The measurement represents the CO levels with no excess air in the sample or with “perfect” combustion (an unrealistic situation). The measurement incorporates an adjustment to the as-measured CO ppm (parts per million) value to simulate oxygen-free conditions in the sample. (See “as-measured carbon monoxide.”)~~

Air Infiltration

~~See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. Air from outside the thermal boundary of a structure, which enters the Conditioned Space Volume.~~

Air Leakage Site

~~A specific location in a structure where the air barrier has irregularities in it allowing both air infiltration and exfiltration depending on the interior pressures of the building.~~

Air Pressure Boundary

~~Any part of the building shell that offers resistance to air leakage. The most effective Air Pressure Boundary consists of a series of air barriers of interior and/or exterior sheeting material that resists airflow through it. An effective air pressure boundary is nearly airtight.~~

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Air Wash

~~The movement of air through insulation.~~

Annual Fuel Utilization Efficiency or AFUE

~~A standardized measure of heating system efficiency, based on the ratio of annual output energy to annual input energy that includes any non-heating season-pilot input loss.~~

Anomaly (defect)

~~An area of a building where the temperature distribution seen with an infrared imaging system differs by more than 4°F from the temperature distribution expected for the type of construction being viewed, denoting a possible problem area; an inconsistency.~~

ANSI

American National Standards Institute

Approved IDR Approval Authority

~~Shall mean the RESNET Standards Management Board (SMB).~~

Approved IDR Review Authority

Shall mean the RESNET Standards Development Committee 300 (SDC 300).

Approved Rating Provider

Shall mean a RESNET-accredited Rating Quality Assurance Provider who is listed in good standing in the National RESNET Registry.

Approved Software Rating Tool

Shall mean a RESNET-accredited HERS® Rating Tool that has been tested and approved in accordance with RESNET Publication 002 and that is listed in the RESNET National Registry of Accredited Rating Software Programs

http://www.resnet.us/professional/programs/energy_rating_software

Approved Tester

Shall mean a RESNET Rater or Rating Field Inspector (RFI) who has been certified by a RESNET-accredited Quality Assurance Provider and who is listed in good standing in the National RESNET Registry.

As-measured Carbon Monoxide

A direct measurement of carbon monoxide CO in a sample of air or flue gas, usually measured in ppm (parts per million) units. (See “air-free carbon monoxide.”)

ASHRAE

American Society of Heating, Refrigerating and Air-Conditioning Engineers

ASNT

~~American Society for Nondestructive Testing~~

ASTM

ASTM International, originally known as the American Society for Testing and Materials (ASTM)

Atmospherically-Vented

~~An appliance using a natural draft venting system.~~

Atmospheric Pressure

~~The weight of air and its contained water vapor on the surface of the earth; at sea level, this pressure is 14.7 pounds per square inch.~~

Auxiliary Electric Consumption

~~The annual auxiliary electrical energy consumption for a fossil fuel fired furnace or boiler in kilowatt-hours per year, derived from the Eae as follows: Auxiliary Electric Consumption~~

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$(\text{kWh/yr}) = E_{ac} * (\text{HLH}) / 2080$ where: HLH = annual heating load hours seen by the furnace/boiler. Note: If fan power is needed (kW), it is determined by $E_{ac} / 2080$.

Back Draft

Sustained downdraft during burner operation.

Base Load

An estimate of fuel consumption that does not include cooling or heating fuel consumption.

Bedroom

See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. A room or space 70 square feet or greater, with egress window and closet, used or intended to be used for sleeping. A “den,” “library,” “home office” with a closet, egress window, and 70 square feet or greater or other similar rooms shall count as a bedroom, but living rooms and foyers shall not.

Biomass Fuel

Non-liquid and non-gaseous combustible substance burned to create energy, such as chunk wood, wood chips, corn husks, etc.

Biomass System

A biomass fuel combustion device and all associated mechanisms, controls, venting, and heat-delivery components designed to provide space heating.

Blackbody

An object or surface which absorbs all radiant energy, within a specific spectral band, coming into contact with the surface and does not reflect or transmit any. Thus, the surface has an emissivity of 1.

Boiler

A space heating appliance that heats water with hot combustion gases that pass through a heat exchanger.

BPI

Building Performance Institute

Building Analyst (BA), Certified

An individual who successfully passes the BPI written and field examination requirements for certification in order to evaluate the performance of a home, taking into account systems, physical conditions and other energy and non-energy characteristics of the home.

Building Envelope

The components of a building (walls, ceilings, windows, doors, floors, and foundations) that separate the conditioned space from the unconditioned spaces or conditioned space from outside.

Building Permit Date

The date on which the permit authorizing the construction of a building is issued by the authority having jurisdiction to issue such permits.

CAZ

See “Combustion appliance zone”

Carbon Monoxide (CO)

An odorless, colorless gas that can cause illness or death.

Carbon Monoxide Emissions

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Carbon monoxide (CO) resulting from combustion as measured in ppm (parts per million). The measurement of CO emissions in flue gas requires a sample to be taken before dilution air enters the venting system. (See “air-free carbon monoxide” and “as-measured carbon monoxide.”)

Certified Rater

Shall mean a RESNET Rater who has become qualified to conduct home energy ratings through certification by a RESNET-accredited Quality Assurance Provider and who is listed in good standing in the National RESNET Registry.

Climate Zone

A geographical area defined as having similar long-term climate

Code Approved HVAC Tape

~~Any tape that is approved by current International Codes (UL181 A or 181 B) used for the air-sealing of a heat and air duct system.~~

Combustion Appliance Zone (CAZ)

A contiguous air volume within a building that contains a combustion appliance; the zone may include, but is not limited to, a mechanical closet, mechanical room, or the main body of a house, as applicable.

Compartmentalization Boundary - See the definition in standard ANSI/RESNET/ICC 380 Standard for Testing Airtightness of Building, Dwelling Unit, and Sleeping Unit Enclosures; Airtightness of Heating and Cooling Air Distribution Systems; and Airflow of Mechanical Ventilation Systems.

Complaint Resolution Officer (CRO)

The individual assigned to manage complaint and resolution procedures for the CEQ Provider.

Compression (insulation)

~~This condition includes but is not limited to batt insulation compressed behind plumbing, heat and air, electrical, and other in cavity obstructions that results in the loss of R-value of the installed insulation. This condition can also occur within a wall cavity without obstructions. See also “Misalignment”.~~

Conditioned Floor Area (CFA)

~~See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. The floor area of the Conditioned Space Volume within a building, minus the floor area of attics, floor cavities, crawlspaces, and basements below air sealed and insulated floors. The following specific spaces are addressed to ensure consistent application of this definition:~~

- ~~• The floor area of a wall cavity that is Conditioned Space Volume shall be included.~~
- ~~• The floor area of a basement shall only be included if the party conducting evaluations has either:
Obtained an ACCA Manual J, S, and either B or D report and verified that both the heating and cooling equipment and distribution system are designed to offset the entire design load of the volume, or,
Verified through visual inspection that both the heating and cooling equipment and distribution system serve the volume and, in the judgment of the party conducting evaluations, are capable of maintaining the heating and cooling temperatures specified by the Thermostat section in Table 4.2.2(1) of ANSI/RESNET/ICC 301-2104.~~
- ~~• The floor area of a garage shall be excluded, even when it is conditioned.~~
- ~~• The floor area of a thermally isolated sunroom shall be excluded.~~

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- ~~The floor area of an attic shall be excluded, even when it is Conditioned Space Volume.~~
- ~~The floor area of a floor cavity shall be excluded, even when it is Conditioned Space Volume.~~
- ~~The floor area of a crawlspace shall be excluded, even when it is Conditioned Space Volume.~~

Conditioned Space

~~Any directly conditioned space or indirectly conditioned space, as defined in this standard.~~

Conditioned Space Volume

~~See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index.~~

~~If the volume both above and below a floor cavity meets this definition, then the volume of the floor cavity shall also be included. Otherwise the volume of the floor cavity shall be excluded.~~

~~If the volume of one or both of the spaces horizontally adjacent to a wall cavity meets this definition, then the volume of the wall cavity shall also be included. Otherwise, the volume of the wall cavity shall be excluded.~~

~~The volume of an attic that is not air sealed and insulated at the roof deck shall be excluded.~~

~~The volume of a vented crawlspace shall be excluded.~~

~~The volume of a garage shall be excluded, even when it is conditioned.~~

~~The volume of a thermally isolated sunroom shall be excluded.~~

~~The volume of an attic that is air sealed and insulated at the roof deck or an unvented crawlspace shall only be included if the party conducting evaluations has obtained an ACCA Manual J, S, and either B or D report and verified that both the heating and cooling equipment and distribution system are designed to offset the entire design load of the volume.~~

~~The volume of a basement shall only be included if the party conducting evaluations has either:
Obtained an ACCA Manual J, S, and either B or D report and verified that both the heating and cooling equipment and distribution system are designed to offset the entire design load of the volume, or;
Verified through visual inspection that both the heating and cooling equipment and distribution system serve the volume and, in the judgment of the party conducting evaluations, are capable of maintaining the heating and cooling temperatures specified by the Thermostat section in Table 4.2.2(1) of ANSI/RESNET/ICC 301-2104.~~

Confirmed Rating

A Rating accomplished using data gathered from verification of all rated features of the home in accordance with [Chapter 3- National Home Energy Rating Technical Standards](#) and [ANSI/RESNET/ICC 380-2016](#) (e.g., on-site visual inspections, on-site diagnostic test results or default values for envelope air leakage rates and distribution system efficiencies).

Confirmed Threshold Rating

~~See Interim Addendum 28i listed under “ADOPTED 2017 ENHANCEMENTS TO THE NATIONAL HOME ENERGY RATING STANDARDS”~~

Contractor, Certified

~~A contractor accredited by the Building Performance Institute (BPI) or an equivalent certification organization recognized by the Home Performance with ENERGY STAR® Program to complete specific home performance improvement work.~~

Contractor Education and Qualification Provider (CEQ Provider)

~~An organization approved by RESNET in accordance with the requirements of these guidelines to train and prepare individuals to be an Energy Smart Contractor’s Designated Qualification~~

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Representative and to perform the other duties of a Contractor Education and Qualification Provider established herein.

COP

~~Coefficient of Performance, which is the ratio of the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system under designated operating conditions.~~

Crawl Space

~~A shallow unfinished space, beneath the first floor or under the roof of a building allowing access to wiring or plumbing.~~

Data Collection

The gathering of information on building energy features, energy use history and other relevant building and building operation information.

Defect

~~See Anomaly~~

Design Temperature

~~99.0% (heating) or 1.0% (cooling) design temperature as published in the ASHRAE Handbook of Fundamentals for the city where the home is located or the most representative city for which design temperature data are available. A high or low outdoor temperature equaled or exceeded 97.5% of the time, used for designing heating and cooling systems.~~

Detached One and Two Family Dwelling

~~A building with one or two independent dwelling units with an individual or central HVAC system.~~

Dewpoint

~~The temperature at which a given air/water vapor mixture is saturated with water vapor (i.e. 100% relative humidity). Consequently, if air is in contact with a surface below this temperature, condensation (dew) will form on the surface.~~

Diagnostic Testing

The use of building performance-testing equipment (e.g. blower door, duct blaster, flow hood, infrared camera, CO monitor, etc.) to measure, assess and document specific performance characteristics of the building system.

Dilution Air

Air that enters a draft diverter or draft regulator from the room in which the appliance is located.

Directly Conditioned Space

~~An enclosed space having heating equipment with a capacity exceeding 10 Btu/hr-ft², or cooling equipment with a capacity exceeding to 10 Btu/hr-ft². An exception is if the heating and cooling equipment is designed and thermostatically controlled to maintain a process environment temperature less than 65 degrees Fahrenheit or greater than 85 degrees Fahrenheit for the whole space the equipment serves.~~

Direct Vent Appliance

~~A combustion appliance for which all combustion gases are vented to the outdoors through an exhaust vent pipe and all combustion supply air is vented to the combustion chamber from the outdoors through a separate, dedicated supply air vent.~~

Distribution System Efficiency

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~~A system efficiency factor, not included in manufacturer's performance ratings for heating and cooling equipment, that adjusts for the energy losses associated with the delivery of energy from the equipment to the source of the load, such energy losses associated with heat transfer across duct or piping walls and air leakage to or from forced air distribution systems.~~

Downdraft

Air flow from a chimney or venting system into an enclosed building space.

Draft

A pressure difference that causes combustion gases or air to move through a vent connector, flue, chimney, or combustion chamber.

Draft Diverter

A nonadjustable device built into an appliance or a part of a vent connector that is intended to (1) permit the escape of flue gases in the event of a blockage or backdraft; (2) prevent a downdraft of outdoor air from entering the combustion chamber of an appliance; (3) reduce the effect of the chimney's stack action; and (4) lower the dew point temperature of the flue gas by the infusion of room air.

Draft Regulator

A self-regulating damper attached to a chimney or vent connector for the purpose of controlling draft: A draft regulator can reduce draft; it cannot increase draft.

Drainage Plane

~~A seamless or overlapping membrane designed to redirect water away from vulnerable building materials.~~

Dwelling

See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index~~Any building that contains one or two Dwelling Units used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes.~~

Dwelling Unit

See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index~~A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation.~~

EAE

~~The average annual auxiliary electrical energy consumption for a gas furnace or boiler in kilowatt-hours per year as published in the AHRI Consumer's Directory of Certified Efficiency Ratings.~~

Effective Date

The date on which an amendment approved for publication shall be first allowed, but not required, to be used on any Dwelling Unit or Sleeping Unit. For an amendment that requires a change to Approved Software Rating Tools, the date by which updated Approved Software Rating Tools shall be approved and listed.

Emissivity

~~The ability of a surface to emit radiation, measured as the ratio of the energy radiated within a specific spectral band by a surface to that radiated within that same specific spectral band by a blackbody at the same temperature.~~

Energy Efficiency Program, or EEP

See “Third-Party Energy Efficiency Program”

Energy Efficiency Rating

~~An unbiased indication of a home’s relative energy efficiency based on consistent inspection procedures, operating assumptions, climate data and calculation methods.~~

Energy Analysis Tool

A computerized calculation procedure for determining a home’s energy efficiency rating and estimating annual purchased energy consumption and cost.

Energy Efficiency Rating, or Energy Rating

See Home Energy Rating.

Energy Factor, or EF

~~A standardized measure of water heater energy efficiency as determined under Department of Energy Regulations, 10 CFR 430.23(e)(2)(ii).~~

Energy Saving Measure, or Feature

Any material, component, device, system, construction method, process, or combination thereof that will result in a reduction of energy use.

Energy Simulation File

The complete set of input data used by a RESNET-accredited rating software tool to determine the Home Energy Rating for the specified home as listed in Section 102.1.4.11 of these Standards.

Energy Smart Contractor

A home improvement contracting company that has been approved by a CEQ Provider to implement energy-saving work scope recommendation prescribed by a certified CHERS Rater or Building Performance Auditor. A home improvement company from any of the trade categories defined on the Directory, who is compliant with the RESNET training, examination and the program requirements contained herein is eligible for designation as Energy Smart and may be listed on the Directory

Energy Smart Contractor Directory (Directory)

A listing of approved Energy Smart Contractors that is posted on the RESNET website.

Energy Smart Contractor Candidate for Recognition (Candidate)

A company with a Designated Qualification Representative who intends to become an Energy Smart Contractor, who shall list itself in the Candidate section, and who shall have 90 days to complete its qualification requirements and receive approval by a CEQ Provider. If the Candidate has not been approved within the time limits, their listing will be removed.

Energy Smart Contractor Representative (Representative)

An individual employed by or a representative of an Energy Smart Candidate, with the necessary level of authority who shall take the required course, pass the RESNET core exam, and otherwise ensure that the contractor, once approved as an Energy Smart Contractor, complies with the terms and conditions of the Directory.

Energy Smart Improved Home

A home that has undergone an Energy Smart Project for which the estimated energy savings calculated by an Independent Rater/Auditor using RESNET-approved software amounts to no less than a 30% reduction in estimated energy usage as a result of the improvements. A home that meets these requirements shall be labeled with the language, “This home is designated as an Energy Smart Home. As such, the estimated energy usage of the home has been reduced by XX%. It is estimated that the improvements to this home will save approximately \$XXX per year.”

Energy Smart Project

A home performance improvement project with the goal of achieving a 30% reduction in estimated energy usage. The project shall be completed by an Energy Smart Home Performance Team; as such it must involve at least one Energy Smart Contractor and an Independent RESNET Rater/Auditor, one of which acts as the Project Manager, and in which applicable improvement measures are installed by one or more Energy Smart Contractors based upon the assessment and work scope from a RESNET Rater/Auditor. An Energy Smart project shall include Final Verification of the project post-improvement by an Independent Rater/Auditor, who shall calculate the estimated energy savings using RESNET-approved software.

Energy Smart Project Manager

The company or individual with whom the homeowner contracts for the coordinated installation of comprehensive energy-saving retrofits prescribed by a certified Rater/Auditor, and who is responsible for the duties of Project Manager. The Energy Smart Project Manager could be the Rater/Auditor or an Energy Smart Contractor that meets the additional qualification defined in Section 1004.6.

Energy Smart Home Performance Team (Energy Smart Team)

A team consisting of Energy Smart contracting companies and a RESNET certified Rater/Auditor who can collectively prescribe, complete and verify an Energy Smart Home Project.

EPA Act

~~The U.S. Energy Policy Act of 1992.~~

Equivalent Electric Energy

~~The amount of electricity that would be produced from site fossil fuel uses when converted to electrical power using the Reference Electricity Production Efficiency.~~

Estimated Annual Energy Cost Savings

~~Positive dollar difference between estimated annual energy costs for an improved existing home as compared with the same home in its original condition or for a new home, as compared with the HERS Reference Home, local code or, for the purposes of Fannie Mae mortgages, the RESNET representation of the 1993 Model Energy Code, whichever is applicable.~~

Ethics & Appeals Committee

A Committee that is responsible for investigating ethics and consumer complaints and hearing a Provider's appeal of its non-approval or renewal of an application, probation, suspension, or revocation.

Evaluation

An analysis of the data collected from any survey or audit, on-site data collection and performance testing, available energy usage records to determine energy use and potential savings from improvements.

Examination

Test developed by RESNET and administered by an Accredited Rater Training Provider.

Excess Air

Air supplied to a burner in excess of the amount needed for complete combustion.

Exposed Wall

~~Walls subjected to heat loss or gain.~~

Failed Item

A “failed item” constitutes a category of failure, such as insulation installation, duct leakage, prescriptive air sealing requirements, insulation enclosure, eave baffles, mechanical system efficiency, window specifications, etc. For the purpose of follow-up inspections, a “failed item” is not limited to the specific instance in a home but to that category of the minimum rated features as it applies to that home design.

Failure (as used in Chapter 6)

See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. When one or more of the threshold specifications is not met during the testing and inspection process.

Fenestration

~~A glazed opening and its associated sash and framing that is installed into a building.~~

Fan-assisted Combustion

~~A combustion appliance with an integral fan that draws combustion supply air through the combustion chamber.~~

Field-of-View (FOV)

~~The total area of height by width, normally expressed in either degrees or radians, in which an infrared imaging system is capable of displaying, imaging, and recording objects.~~

Final Verifier

The Final Verifier must be an independent RESNET Rater/Auditor that did not conduct the initial Energy Smart Project rating/audit, or that does not have a financial interest in any of retrofit work done for the Energy Smart Project, or that is not employed by a company who performs any part of the retrofit work

Flame Rollout

A condition in which burner flames discharge from the cabinet of a combustion appliance.

Flashing

~~sheet material used to cover building joints to prevent bulk water entry~~

Framing Spacing

~~The distance from center to center of wall studs, ceiling joists, floor joists and roof rafters.~~

Furnace

~~A space heating appliance that heats indoor air with hot combustion gases that pass through a heat exchanger.~~

Gaps (insulation)

~~An insulation defect where installed insulation does not completely fill areas of the building enclosure, which allows for conductive and convective heat loss and a reduced R-value of the overall building enclosure.~~

Heat Exchanger

~~A device built for heat transfer from one medium to another. The medium may be separated by a solid wall, so that they never mix, or they may be in direct contact. Furnaces contain heat exchangers, or referred to as combustion chambers, made from stamped steel. Air is directed around the exchanger while the combustion process is occurring inside the heat exchanger, allowing the exchange of heat into the air medium, which is then transferred into the home.~~

Heat Pump

~~A vapor-compression refrigeration device that includes a reversing valve and optimized heat exchangers so that the direction of heat flow may be reversed in order to transfer heat from one~~

~~location to another using the physical properties of an evaporating and condensing fluid known as a refrigerant. Most commonly, heat pumps draw heat from the air or from the ground moving the heat from a low temperature heat source to a higher temperature heat sink.~~

~~*Heating Seasonal Performance Factor, or HSPF*~~

~~A standardized measure of heat pump efficiency, based on the total heating output of a heat pump, in Btu, divided by the total electric energy input, in watt hours, under test conditions specified by the Air Conditioning and Refrigeration Institute Standard 210/240.~~

~~*HERS BESTEST*~~

~~The Home Energy Ratings System Building Energy Simulation Test published as NREL Report No. NREL/TP-472-7332~~

~~*HERS Index*~~

~~A numerical integer value that represents the relative energy use of a Rated Home as compared with the energy use of the HERS Reference Home and where an Index value of 100 represents the energy use of the HERS Reference Home and an Index value of 0 (zero) represents a home that uses zero net purchased energy.~~

~~*Home*~~

~~A building with one or more dwelling units that has three or fewer stories above grade, or a single dwelling unit within a building of three or fewer stories above grade. A Dwelling Unit or Sleeping Unit.~~

~~*Home Energy Assessment*~~

~~Defined by this standard as one of two levels of energy assessment of a home, including Home Energy Survey and Comprehensive Home Energy Audit.~~

~~*Home Energy Rater, or HERS Rater or Rater*~~

~~An individual meeting the minimum training requirements for Raters set forth in [Chapter 2](#) of these Standards, documented by an Accredited RESNET Training Provider, and certified by an Accredited Rating Quality Assurance Provider to inspect a home to evaluate the minimum rated features and complete Home Energy Ratings (see also Rating Field Inspector).~~

~~*Home Energy Rater Candidate, or Rater Candidate*~~

~~An individual who has received instruction from a RESNET Accredited Training Provider and has passed the required RESNET tests.~~

~~*Home Energy Rating, or Rating*~~

~~An unbiased indication of a home's relative energy performance based on consistent inspection procedures, operating assumptions, climate data and calculation methods in accordance with the "National Energy Rating Technical Standards" ([Chapter 3](#) of this Standard). See also "Rating, Confirmed" and "Rating, Projected".~~

~~*Home Energy Rating Quality Assurance Provider, or HERS QA Provider, or Rating Provider*~~

~~See Accredited Rating Quality Assurance Provider.~~

~~*Home Energy Rating (HERS) Software Provider*~~

~~An organization that develops software accredited by RESNET for use in home energy ratings.~~

~~*Home Energy Rating System, or HERS®*~~

~~The procedures, rules and guidelines by which Home Energy Ratings are conducted by accredited Providers (Rating Quality Assurance, Software, Training, Sampling), as specified in these Standards.~~

~~*Home Energy Survey*~~

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A level of the RESNET Home Energy Audit process defined by this standard to include one of the following: Diagnostic Home Energy Survey, In-Home Home Energy Survey, On-Line Home Energy Survey

Home Energy Survey, In-Home

A level of the RESNET Home Energy Assessment process defined by this standard intended to assess both the general energy performance of the home and the level of the commitment to action on the part of the homeowner. The survey may include data be collected and reported on-line by the homeowner or by a home energy survey professional for the purpose of further analysis and general identification of home performance problems. The intent of the energy survey is to refer homeowners to the next level if it is determined that the home needs further analysis, and the homeowner is motivated to invest in improvements. The On-Line or In-Home Home Energy Survey is not required if the homeowner wishes to directly pursue a Diagnostic Home Energy Survey or Comprehensive Home Energy Audit.

Home Energy Survey, On-Line

A basic energy review of a home using an internet-based tool or software.

Home Energy Survey Provider

An organization accredited by RESNET in accordance with Section 703 of the Mortgage Industry National Home Energy Rating Systems Standards to certify Home Energy Survey Professionals to perform Home Energy Surveys and Auditors to perform Comprehensive Home Energy Audits in accordance with this Standard, and to maintain QUALITY assurance of the Home Energy Survey.

Home Energy Survey Professional (HESP)

An individual certified by an accredited Home Energy Survey Provider to conduct Home Energy Surveys.

Home Performance Assessment

A detailed evaluation of the condition of a home as a building system, including evaluation of all materials, components, features, systems and subsystems that affect the energy use of the home.

Home Performance with ENERGY STAR[®], or HPwES

~~A national program developed by the Environmental Protection Agency (EPA) and the Department of Energy (DOE), that offers a comprehensive, whole house approach to improving energy efficiency and comfort of homes, while maintaining or improving safety.~~

House Wrap

~~A weather resistant material, intended to serve as an air/moisture barrier if sealed carefully at seams.~~

HVAC

Heating, Ventilating and Air Conditioning.

IECC

International Energy Conservation Code.

Inches of Water Column (IWC)

A unit of pressure difference; 1 IWC = 250 Pascals (see "Pascal.")

Independent Rater/Auditor

A RESNET Rater/Auditor who performs Final Verification of an Energy Smart Project in accordance with these sections and is certified by a RESNET-accredited Rating Provider in accordance with RESNET Standards. Independent Rater/Auditors shall be independent of the

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Auditor/Rater or Contractor(s) who installed the recommended measures, and may receive no financial compensation for any of the retrofits performed on the project.

Induced combustion

See “fan-assisted combustion.”

Industry Accepted Standards for [Chapter 10](#)

Industry recognized standards that include the following:

ACCA—Air Conditioning Contractors of America (2800 Shirlington Road, Suite 300, Arlington, VA, 22206; tel: 703/575-4477; <http://www.acca.org>)

ACCA 4 QM—2007 Maintenance of Residential HVAC Systems in One and Two Family Dwellings Less Than Three Stories

ACCA 5 QI—2010 HVAC Quality Installation Specification

ACCA 6 QR—2007 Standard for Restoring the Cleanliness of HVAC Systems

ACCA 9 QIvp. 2011 HVAC Quality Installation Verification Protocols

ACCA 12 QH 201X Existing Home Evaluation and Performance Improvement

RESNET—Residential Energy Services Network (P.O. Box 4561, Oceanside, CA, 92052-4561; 1-800-836-7057; <http://www.resnet.us>)

Mortgage Industry National Home Energy Rating Standard, 2009

RESNET National Standard for Home Energy Audits, 2005

Rating and Home Energy Survey Ethics and Standards of Practice, 1996

RESNET Standards for Qualified Contractors and Builders, 2010

Infiltration Volume

The sum of the Conditioned Space Volume and Unconditioned Space Volume in the dwelling unit, minus the volume of:

- Floor cavities that have Unconditioned Space Volume both above and below,
- Unconditioned wall cavities,
- Attics,
- Vented Crawlspace,
- Garages,
- Basements, where the door between the basement and Conditioned Space Volume is closed during enclosure air leakage testing, and,
- Thermally isolated sunrooms.

Infrared Imaging System

An instrument that converts radiation differences associated with surface temperature variations into a two dimensional image by assigning specific colors or tones to the differing temperatures.

Infrared Thermography

The process of using an infrared imaging system to generate thermal images of the surfaces of objects, which can be viewed electronically or printed.

In-Home Home Energy Survey

A level of the RESNET Home Energy Assessment process defined by this standard intended to assess both the general energy performance of the home and the level of the commitment to action on the part of the homeowner. The survey may include data be collected and reported on-line by the homeowner or by a home energy survey professional for the purpose of further analysis and general identification of home performance problems. The intent of the energy survey is to refer homeowners to the next level if it is determined that the home needs further analysis, and the

homeowner is motivated to invest in improvements. The On-Line or In-Home Home Energy Survey is not required if the homeowner wishes to directly pursue a Diagnostic Home Energy Survey or Comprehensive Home Energy Audit.

Initial Failure

When one or more failure(s) are first identified in a home during the sampling process.

Instantaneous Field of View (IFOV)

The instantaneous spatial resolutions characteristics of thermal imagers (expressed in angular degrees or radians per side if rectangular and if round, in angular degrees or radians), or the smallest object able to be viewed by the imaging system at a given distance.

Instantaneous Water Heater

A water heater that initiates heating based on sensing water flow and has a manufacturer's specified storage capacity of less than 2 gallons.

Internal Gains

The heat gains within a home attributable to lights, people, and miscellaneous equipment.

International Energy Conservation Code (IECC)

The model code for building energy conservation as promulgated by the International Code Council.

Isolated Combustion Appliance Zone

A combustion appliance zone that is not a part of, nor directly connected to, habitable space. It is either outdoors, or is a mechanical room or attached garage that is supplied with outdoor combustion air and separated from habitable space, and which complies with the criteria in Section B.3.2 of this standard.

Interim RESNET Standard or Addendum

A time-critical standard or addendum published by RESNET in accordance with its Standards Development Policy and Procedures Manual or its Standards Development Policy and Procedures Manual for Non-ANSI/RESNET Standards, which requires immediate implementation prior to completion of the final standard development process.

Knob and Tube Wiring

An early method of electrical wiring in buildings, used from about 1880 to the 1930s. It consisted of single insulated copper conductors run within wall or ceiling cavities, passing through joist and stud drill holes via protective porcelain insulating tubes, and supported on nailed-down porcelain knob insulators.

KBtu

1,000 British Thermal Units (Btu)

Labeled Ceiling Fan

A ceiling fan that has been labeled for efficiency in accordance with EPA guidelines such that the label shows the cfm, cfm/watt and watts of the fan at low, medium and high speeds

Labeled Ceiling Fan Standardized Watts (LCFSW)

The power consumption in watts of a Labeled Ceiling Fan "standardized" to a medium speed air-delivery of 3000 cfm.

Lead Based Paint

Paint containing the heavy metal lead, that was used as pigment, to speed drying, increase durability, retain a fresh appearance, and resist moisture that causes corrosion. Although the United States has regulation that prohibits the manufacture or use of lead-based paints in residential or

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~~applications with direct human exposure, lead paint may still be found in older properties painted prior to the introduction of such regulation introduced in 1978. Paint with significant lead content is still used in industry and by the military.~~

Light Fixture

A complete lighting unit consisting of a lamp or lamps, and ballasting (when applicable) together with the parts designed to distribute the light, position and protect the lamps, and connect the lamps to the power supply. For built-in valence lighting, strings of low-voltage halogens, and track lights, each individual bulb shall count as a fixture.

Low-Volume Raters

Raters which complete less than twenty five (25) ratings per year or less than fifty (50) ratings over a two year period.

MBtu

~~One million British thermal units (Btu)~~

Metropolitan Area

Metropolitan and micropolitan statistical areas as defined by the United States Office of Management and Budget (OMB) and published by the United States Census Bureau at <http://www.census.gov> (the most current edition). In areas not included in any defined Metropolitan Area, individual counties may be substituted for the purpose of applying the sampling process.

Misalignment (insulation)

~~A defect which occurs when installed insulation is not in contact with the air barrier and air intrusion between the insulation and the air barrier seriously compromises the effectiveness of the insulation in framed buildings.~~

Model Energy Code: 1993 (MEC '93)

The building energy code as promulgated by the Council of American Building Officials (CABO) in 1992 as amended in 1993. The RESNET representation of MEC '93 is the HERS Reference home as defined in the "Mortgage Industry National Home Energy Rating Standards" dated 1999.

Mechanical Ventilation

~~The active process of supplying or removing air to or from an indoor space by powered equipment such as motor driven fans and blowers but not by devices such as wind driven turbine ventilators and mechanically operated windows.~~

Mechanical Ventilation System

~~A fan designed to exchange the air in the house with outside air, sized to provide whole house service per ASHRAE 62.2, and controlled automatically (i.e. not requiring human intervention to turn on and off). The presence of a remote mounted on-off switch or dedicated circuit breaker labeled "whole house ventilation" (or equivalent) shall not disqualify a system from meeting the requirement of automatic control. The following are three types of mechanical ventilation:~~

~~Balanced—One or more fans that supply outdoor air and exhaust building air at substantially equal rates from the space. This makes heat recovery possible via an air to air heat exchanger.~~

~~Exhaust Only—One or more fans that remove air from the building, causing outdoor air to enter by ventilation inlets or normal leakage paths through the building envelope.~~

~~Supply Only—One or more fans that supply outdoor air to the building, causing indoor air to leave by normal leakage paths through the building envelope~~

Minimum Rated Features

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The characteristics of the building elements which are the basis for the calculation of end use loads and energy consumption for the purpose of a Home Energy Rating, and which are evaluated by Home Energy Raters or Rating Field Inspectors, in accordance with ANSI/RESNET.ICC 301, Appendix B, in order collect the data necessary to create a Home Energy Rating using accredited simulation tools an Approved Rating Software Tool.

NFPA

National Fire Protection Association

NASEO

National Association of State Energy Officials

National Accreditation Body

The Residential Energy Services Network (RESNET) is the National Accreditation Body for all Providers designated in this Standard.

National HERS Rater Test

Computer-based examination developed and administered by RESNET.

National Home Energy Rating Technical Guidelines

Voluntary home energy rating system technical guidelines adopted by the National Association of State Energy Officials (NASEO).

National RESNET Buildings Registry

The national online registry of all rated homes and Certified Raters and Accredited Home Energy Rating Providers which is maintained by RESNET.

Natural Draft Venting System

A venting system that relies on buoyancy to move combustion gases to the outdoors.

NIOSH

National Institute for Occupational Safety and Health.

Normal

The building shell is functioning as designed.

NREL

National Renewable Energy Laboratory.

On-Line Home Energy Survey

A level of the RESNET Home Energy Survey in accordance with this Standard that is a basic energy review of a home using an internet-based tool or software.

On-site Power Production (OPP)

Electric power produced at the site of a Rated Home. OPP shall be the net electrical power production, such that it equals the gross electrical power production minus any purchased fossil fuel energy, converted to its Equivalent Electric Power, used to produce the on-site power.

OSHA

Occupational Safety and Health Administration.

Pascal (Pa)

The metric unit of pressure equaling 1 Newton per square meter, or 0.004 inch W.G.

Performance Testing

Testing conducted to evaluate the performance of a system or component using specified performance metrics.

Polyethylene Sheeting

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~~Any sheet material made of polyethylene, often called Visqueen™, used as a moisture barrier either on the walls of a structure built in an extreme northern climate or as a barrier covering the dirt on the floor of a basement or crawl space.~~

~~*Power Burner*~~

~~A burner for which air is supplied at a pressure greater than atmospheric pressure; includes most oil-fired burners and gas burners used as replacements for oil burners.~~

~~*Power-Vented*~~

~~An appliance that operates with positive static pressure in the vent, and is constructed and installed with a fan or blower to push all the products of combustion directly to the outdoors through independent sealed vents connected directly to the appliance.~~

~~*Predicted Depressurization*~~

~~Calculated house depressurization after improvements, accounting for estimated change in house-tightness and exhaust fan flow.~~

~~*Probationary Rating*~~

~~Ratings conducted by a Rater Candidate while supervised by a Candidate Field Assessor under the auspices of an Accredited RESNET Rating Provider.~~

~~*Projected Rating*~~

~~A Rating accomplished using minimum rated feature data derived from home plans and specifications or based on a site audit for a to-be-improved home which have not yet been implemented in the field. Projected Ratings are commonly generated prior to the construction of a new building or prior to the implementation of energy-efficiency improvements to an existing building.~~

~~*Publication Date*~~

~~Following approval by the Standards Management Board, the date on which an amendment is officially published with a title and/or reference number. This date indicates that an amendment is final, but it shall not be used until the Effective Date.~~

~~*Purchased Energy*~~

~~The portion of the total energy requirement of a home purchased from a utility or other energy supplier.~~

~~*Purchased Energy Fraction (PEfrac)*~~

~~The fraction of the total energy consumption of the Rated Home that is purchased energy, wherein all site fossil energy uses are converted to their Equivalent Electric Power using the Reference Electricity Production Efficiency of 40%.~~

~~*QH Standard BSR/ACCA 12-QH 201x (Existing Home Evaluation and Performance Improvement)*~~

~~A standard that establishes the minimum criteria by which deficiencies in existing residential buildings are identified by audit, improvement opportunities are assessed, scopes of work are finalized, work is performed in accordance with industry recognized procedures, and improvement objectives were met.~~

~~*Qualitative (insulation)*~~

~~In relation to insulation inspections, determining general areas of anomalies without assigning temperature values to the patterns.~~

~~*Qualifying Light Fixture*~~

~~A light fixture located in a Qualified Light Fixture location and comprised of any of the following components: a) fluorescent hard-wired (i.e. pin-based) lamps with ballast; b) screw-in compact fluorescent bulb(s); or c) light fixture controlled by a photocell and motion sensor.~~

Qualifying Light Fixture Locations

~~For the purposes of rating, those light fixtures located in kitchens, dining rooms, living rooms, family rooms/dens, bathrooms, hallways, stairways, entrances, bedrooms, garage, utility rooms, home offices, and all outdoor fixtures mounted on a building or pole. This excludes plug-in lamps, closets, unfinished basements, and landscape lighting.~~

Quality Assurance (QA)

~~See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. The planned and systematic processes intended to ensure compliance with current applicable standards in a systematic, reliable fashion.~~

Quality Assurance Data File (QA Data File)

The collection of data that comprises the complete quality assurance information for a specific Home Energy Rating, including take-off forms, field data collection forms, energy simulation files, building plans, RESNET Standard Disclosure Forms, rating certificates, rating reports, QA records (including findings and the resolution of any issues), photo documentation, as well as any documentation required by Third-Party Energy Efficiency Programs (EEP's) such as checklists, copies of labels or third-party certificates), and the names of each certified individual (i.e. Raters and/or Rating Field Inspectors) who worked on the rating (field inspections, modeling, etc.).

Quality Assurance Designee (QA Designee)

An officer, employee, or contractor responsible for quality assurance within a Provider organization, who has met the requirements of section 905.3 of this Chapter and has signed an agreement with the Provider to be the Provider's QA Designee.

Quality Assurance Designee Delegate (QA Delegate)

An individual certified as a Home Energy Rater, appointed by a Quality Assurance Designee to complete a portion of the Quality Assurance process, who has met the requirements of section 904.7 of this Chapter.

Quality Assurance Designee, Primary (Primary QA Designee)

The one QA Designee for a Provider who shall have ultimate responsibility, on behalf of the Provider, for fulfilling the Provider's QA requirements/responsibilities and who shall be the single point of contact to RESNET regarding all Quality Assurance matters.

Quality Assurance Committee (QA Committee)

A Standing Committee of the RESNET organization that is responsible for the oversight of RESNET's rating quality assurance program, review and ruling on the merits of formal Ethics and Consumer Complaints received by RESNET, and review and rule on the merits of all appeals of non-approval or renewal of an application, probation, suspension, or revocation.

Quality Assurance Plan

A QA Provider's written quality assurance processes and procedures as specifically required in [Chapter 9](#) of these Standards.

Quantitative

~~In relation to insulation inspections, determining the total square footage of anomalies of a structure as a percentage of the total surface area of the structure in square feet.~~

Radon Mitigation

The method(s) for reducing radon entry into attached and detached residential buildings. This practice is intended for use by trained, certified or licensed, or both, or otherwise qualified individuals, following ASTM E 2121-09, Standard Practice for Installing Radon Mitigation Systems in Existing Low Rise Residential Buildings.

Radon Testing

Typically one of two approaches is used: 1) Approved radon test kit is purchased and used by the person responsible for the building, 2) Certified and/or licensed independent radon tester to perform the required radon test. A short term test remains in the home for 2 to 90 days, whereas a long term test remains in your home for more than 90 days.

There are two types of radon testing devices. **Passive** radon testing devices do not need power to function and include; charcoal canisters, alpha track detectors, charcoal liquid scintillation devices, and electric ion chamber detectors. Both short and long term passive devices are generally inexpensive. **Active** radon testing devices require power to function and usually provide hourly readings and an average result for the test period. These include continuous radon monitors and continuous working level monitors, and these tests may cost more. All radon tests should be taken for a minimum of 48 hours. A short term test will yield faster results, but a long term test will give a better understanding of the home's year round average radon level. Regardless of the approach used if the radon level is confirmed to be 4 picoCuries per liter (pCi/L) or higher, the mitigation should occur.

Rated Home

The specific home being evaluated using the ~~rating~~ Home Energy Rating procedures contained in the National Home Energy Rating Technical Guidelines Chapter 3 and ANSI/RESNET/ICC 301.

Rater

See Home Energy Rater.

Rater Candidate

See Home Energy Rater Candidate.

Rater Test Identification Number (RTIN)

The unique numerical identifier for each individual who has passed the RESNET National Home Energy Rater Exam as assigned by RESNET through the RESNET Buildings Registry. This number also serves as the Rater's ID number once they have been certified by a Rating QA Provider.

Rater Specialty Certification

Professional building performance certification recognized by RESNET as part of a Home Energy Rater's advanced certification.

Rater Instructor, Certified

An individual certified by RESNET and designated by an Accredited Training Provider to provide instruction and assistance to candidates. Only RESNET Certified Rater Instructors may provide rater instruction under the auspices of a RESNET Accredited Training Provider.

Rater Training Provider, ~~or~~ Training Provider or Rater Trainer

See Accredited Rater Training Provider

Rating

See Home Energy Rating.

Rating Field Inspector (RFI)

A Field Inspector is the entry level of Rater certification. A Field Inspector under the direct supervision of a certified home energy Rater may conduct the inspections and necessary basic performance tests (blower door& duct blaster) to produce a home energy rating. This category requires the ability to identify and quantify building components and systems.

Rating Index

See HERS Index.

Rating Quality Assurance Provider or QA Provider

See Accredited Rating Quality Assurance Provider.

Rating, Projected

A rating performed prior to the construction of a new building or prior to implementation of energy-efficiency improvements to an existing building.

Rating Sampling Provider

See Sampling Provider.

Rating Software

A computerized procedure that is accredited by RESNET for the purpose of conducting home energy ratings and calculating the annual energy consumption, annual energy costs and a HERS Index for a home.

Rating Tool

A computerized procedure for calculating a home's energy efficiency rating, annual energy consumption, and annual energy costs.

~~*Reference Electricity Production Efficiency*~~

~~Electric power production efficiency, including all production and distribution losses, of 40%, approximating the efficiency of a modern, high efficiency, central power plant. The Reference Electricity Production Efficiency is to be used only to convert site fossil fuel energy uses to an Equivalent Electric Power for the sole purposes of providing home energy rating system credit for On-site Power Production.~~

~~*Reference Home*~~

~~A hypothetical home configured in accordance with the specifications set forth in Chapter 3 and Standard ANSI/RESNET/ICC 301 as the basis of comparison for the purpose of calculating the relative energy efficiency and Home Energy Rating Index of a Rated Home.A hypothetical home configured in accordance with the specifications set forth in the National Home Energy Rating Technical Guidelines for the purpose of calculating rating scores.~~

Refrigerant

A compound that absorbs heat when it under goes a phase change, e.g. gas to a liquid. Traditionally, the chlorofluorocarbon (CFC) R-22 was used as a refrigerant for residential air conditioners and heat pumps. Since 1992 time frames have been established for replacing chlorofluorocarbon refrigerants, with non chlorofluorocarbon refrigerants often referred to as R-410A. The ideal refrigerant has a boiling point somewhat below the target temperature, a high heat of vaporization, a moderate density in liquid form, a relatively high density in gaseous form, and a high critical temperature. Since boiling point and gas density are affected by pressure, refrigerants may be made more suitable for a particular application by choice of operating pressure.

Refrigerant Charge

Quantity of refrigerant in a vapor compression refrigeration/heating system, determined by measuring the discharge and suction pressures/temperatures in the system.

Energy Smart Contractor Registry

The database maintained by a CEQ Provider of all Energy Smart Contractors they have approved.

~~Relative Humidity (RH)~~

~~The water vapor pressure in the air expressed as a proportion of the saturated water vapor pressure (i.e. the highest possible value) at the current air temperature.~~

~~Residential Building~~

~~See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index Includes detached one and two family Dwellings and multiple single family Dwellings (Townhouses) as well as International Building Code Group R 2, R 3 and R 4 buildings three stories or less in height above grade plane. (i.e. residential other than where occupants are transient, such as hotels and motels)~~

~~RESNET~~

~~Residential Energy Services Network~~

~~RESNET Accredited Software~~

~~See Approved Software Rating Tool~~

~~RESNET Candidate Field Assessor~~

~~An individual certified by RESNET and designated by an Accredited RESNET Rating Quality Assurance Provider to conduct probationary and field assessments for candidates.~~

~~RESNET Combustion Appliance Simulation Test or Combustion Appliance Test~~

~~Simulation based practical test adopted by RESNET used for the assessment of RFI and HERS-Rater candidates.~~

~~RESNET National Buildings Registry~~

~~The national online registry of all rated homes and Certified Home Energy Raters which is maintained by RESNET.~~

~~RESNET Executive Director (Executive Director)~~

~~A person elected by the Board of Directors of the Residential Energy Services Network (RESNET) to be the Chief Executive Officer of RESNET.~~

~~RESNET National Rater Trainer-Instructor Competency Test~~

~~Certification test developed and administered by RESNET to ensure that accredited Accredited Rater Training Providers' trainers have the requisite knowledge and competence to serve as trainers for prospective certified Raters. The test is based on the national core competency exam developed and maintained by RESNET.~~

~~RESNET Rater Simulation Practical Test~~

~~Simulation based practical test adopted by RESNET used for the assessment of HERS Rater candidates.~~

~~RESNET Recognized Home Performance Standard~~

~~Technical standard developed to offer a comprehensive, whole house approach to improving energy efficiency and comfort of existing homes, while maintaining or improving and durability safety.~~

~~RESNET Quality Assurance Checklist~~

~~Checklist developed by RESNET for use by a Quality Assurance Designee in evaluating a Rating Quality Assurance Provider's compliance with the requirements of accreditation and quality~~

assurance as stipulated by Section 904.3 of these Standards, and which enumerates the individual requirements that must be verified annually.

Return Duct

~~Duct carrying air back (return) to the heating and cooling equipment.~~

Room Pressure Differential

~~In many parts of the country, supply air is delivered to individual rooms, but return air is located only or primarily in the central body of the home. The absence of return air in closeable spaces causes positive pressure in the closed rooms and negative pressure in the central zone. These positive and negative pressure differentials create a number of unwanted impacts, which may include; contaminants in the soil (e.g., radon), sewer gases in poorly trapped drain lines, and air contaminants (e.g., pesticides, mold odors, chemicals, auto exhaust, dust) in unconditioned zones such as crawl spaces and garages being drawn into the conditioned living space. Negative pressure can also produce combustion venting problems such as; very high levels of Carbon Monoxide or push the flame out of the combustion chamber in a process referred to as flame roll out. These combustion system impacts can create serious dangers for both home and occupants. In order to alleviate the differentials, “jumper ducts”, “transfer grilles” or individual returns are installed to alleviate or balance the pressures differential between zones.~~

R-Value

~~See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index Thermal resistance value measured in h-ft²-F/Btu.~~

Sample Set

A specific group of homes from which one or more individual homes are randomly selected for sampling controls.

Sampling

An application of the Home Energy Rating process whereby fewer than 100% of a builder’s new homes are randomly inspected and tested in order to evaluate compliance with a set of threshold specifications.

Sampling Controls

A collection or set of required tests and inspections performed for a sample set of homes in order to confirm that the threshold specifications have been met. “Sampling controls” may refer to the entire set of tests and inspections, or to a particular phase that constitutes a defined subset of those tests and inspections (e.g. pre-drywall, final, HVAC, windows and orientation, etc).

Sampling Provider

An entity, accredited through these standards, that oversees the sampling process and issues the sampling certifications that homes meet a particular set of threshold specifications such as the ENERGY STAR® specifications adopted by the U.S. Environmental Protection Agency.

Seasonal Energy Efficiency Ratio, or SEER

~~A standardized measure of air conditioner efficiency based on the total cooling output of an air conditioner in Btu/h, divided by the total electric energy input, in watt-hours, under test conditions specified by the Air Conditioning and Refrigeration Institute Standard 210/240.~~

Senior Certified Rater

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~~A senior Rater is the first category of advanced Rater certification. Senior Certified Raters have demonstrated that they have the increased experience and knowledge base to interpret the findings of a rating and make recommendations on how the home can be improved.~~

~~*Sensible Heat Ratio (SHR)*~~

~~The sensible heat or cooling load divided by the total heat or cooling load.~~

~~*Shall*~~

As used in this Standard, the word ‘shall’ means that the action specified is mandatory and must be accomplished by the responsible party.

~~*Sleeping Unit*~~

~~See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. A room or space in which people sleep, which can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a Dwelling Unit are not sleeping units.~~

~~*Spectral Wavelength*~~

~~The electromagnetic wavelength interval or equivalent over which observations are made when using an infrared imaging system.~~

~~*Spillage, Spill*~~

~~Combustion gases emerging from an appliance or venting system into the combustion appliance zone during burner operation.~~

~~*Standard Ceiling Fan*~~

~~The ceiling fan against which Labeled Ceiling Fans are measured for efficiency. At medium fan speed, the Standard Ceiling Fan produces 3000 cfm of air flow and uses 42.6 watts of power.~~

~~*Standards (HERS Standards)*~~

~~The “Mortgage Industry National Home Energy Rating System Standards”, as maintained by the Residential Energy Services Network (RESNET).~~

~~*Standards Committee Management Board*~~

~~A Standing Committee of the RESNET organization that is responsible overseeing the Standards Amendment process.~~

~~*Story Above Grade Plane*~~

~~Any Story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor next above is:~~

- ~~1. More than 6 feet (1 829 mm) above grade plane; or~~
- ~~2. More than 12 feet (3658 mm) above the finished ground level at any point.~~

~~*Super Heat*~~

~~Heat added to a vapor under pressure, raising the temperature of the vapor above the temperature-pressure reference point~~

~~*Technical Committee*~~

~~A Standing Committee of the RESNET organization that is responsible for review and oversight of the RESNET Technical Standards ([Chapter 3](#)).~~

~~*Thermal Boundary*~~

~~The line or boundary where the air barrier and insulation are installed in a building assembly. The air barrier and insulation should be adjacent to one another in a building assembly to prevent airflow from circumventing insulation.~~

Thermal Expansion Valve (TXV)

A component of a vapor compression refrigeration system that varies the amount of refrigerant flow into the evaporator coil based on temperature and pressure, thereby controlling the superheat at the outlet of the evaporator coil.

Thermal Storage Mass

Materials or equipment incorporated into a home that will store heat, produced by renewable or non-renewable energy, for release at a later time.

Thermal bridging

Heat conduction through building components, typically framing, that are more conductive than the insulated envelope.

Thermal Bypass

Air movement, air leakage or convection "cell", that circumvents the thermal barrier, is usually hidden and is the result of an incomplete or compromised air barrier.

Thermal Image

A recorded electronic or printed image provided by an infrared imaging system of the thermal surface variations of an object or a surface.

Thermal Resolution, or Noise Equivalent Temperature Difference (NETD)

The minimum temperature difference, typically specified in degrees Centigrade at 30 degrees Centigrade, an infrared imaging system is able to distinguish between two blackbody points on a thermal image.

Thermogram

An infrared picture obtained through the use of an infrared imaging system or other means of recording such images.

Thermographer, Level I

A person who is qualified by training, experience and testing to gather high quality data and, where pass/fail guidance is provided, to interpret that data. The American Society for Nondestructive Testing (ASNT) defines a Level I as one who can, 1) Perform calibrations, tests, and evaluations for determining the acceptance or rejection of tested items in accordance with specific written instructions, 2) Record test results but have no authority to sign reports for the purpose of signifying satisfactory completion of NDT operations, and 3) Receive instructions or supervision from a Level III or designee.

Thermography

The process of generating and interpreting thermal images.

Third-Party Energy Efficiency Program, or EEP

A national or local program that has set a standard for energy efficiency in building performance and requires a HERS analysis for verification (e.g. ENERGY STAR® Qualified Homes, Building America's Builders Challenge, building code, International Code Council, utility companies, etc.)

Threshold Rating - A Rating accomplished using Threshold Specifications to determine the Energy Rating Index where verification of all Minimum Rated Features is accomplished through field inspections and testing conducted on every home.

Threshold Specifications

See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating IndexA set of qualification criteria which are established for a sample set based on Worst-Case Analysis or a set

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~~of prescriptive specifications such as the ENERGY STAR[®] prescriptive path adopted by the U.S. Environmental Protection Agency.~~

Townhouse

~~See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. A single-family Dwelling Unit constructed in a group of three or more attached units in which each unit extends from foundation to roof.~~

Training and Education Committee

~~A Standing Committee of the RESNET organization that is responsible for overseeing RESNET training, RESNET tests, and education and professional development for RESNET Providers and Raters.~~

Transfer Duct

~~Properly sized ducting and register grilles installed in the wall or door between the central body of a home and an isolated area, in order to reduce room pressure differentials.~~

Transfer Grille

~~Properly sized grilles installed in the wall or door between the central body of a home and an isolated area, in order to reduce room pressure differentials.~~

Transition Period

The period of time beginning on the Effective Date, during which an amendment shall be allowed, but not required, to be used for any Dwelling Unit or Sleeping Unit.

Transition Period End Date

The date that concludes the Transition Period. An amendment shall be required to be used for a Dwelling Unit or Sleeping Unit whose Building Permit Date is after this date.

Typical Meteorological Year, or TMY Data

~~Hourly climate data published by the National Climatic Center, Asheville, NC, based on historical climate data in 216 locations.~~

U-factor

~~See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. Coefficient of thermal transmittance (expressed as Btu/h-ft²-oF (W/m²-oC)) of a building envelope component or system, including indoor and outdoor air film transmission coefficients.~~

Unconditioned Space Volume

~~See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index. The volume within a building that is not Conditioned Space Volume but which contains heat sources or sinks that influence the temperature of the area or room. The following specific spaces are addressed to ensure consistent application of this definition:~~

- ~~• The volume of a floor cavity shall be included, unless the volume both above and below the floor cavity meets the definition of Conditioned Space Volume.~~
- ~~• The volume of a wall cavity shall be included, unless the wall cavity meets the definition of Conditioned Space Volume.~~
- ~~• The volume of a vented attic shall be included.~~
- ~~• The volume of a vented crawlspace shall be included.~~
- ~~• The volume of a garage shall be included, even when it is conditioned.~~

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- ~~The volume of a thermally isolated sunroom shall be included.~~
- ~~The volume of an attic sealed and insulated at the roof deck, an unvented crawlspace, or a basement shall be included unless it meets the definition of Conditioned Space Volume.~~

Unresolved Complaint

A complaint deemed by the CEQ Provider to require corrective action by the Energy Smart Contractor.

Unvented Combustion Appliance

Any appliances not used with a duct, chimney, pipe, or other device that carry the combustion pollutants outside the home. These appliances can release large amounts of pollutants directly into a home.

U-Value

Thermal transmittance value measured in Btu/h-ft²-F.

Vapor barrier/retarder

~~A material used in the construction process to either slow or stop the movement of moisture, whether in liquid or vapor form, into or out of the building envelope or the wall structure.~~

Vapor-Cycle Refrigerant-Based Equipment

~~The most widely used method for air conditioning of private residences in the United States. System uses a circulating liquid refrigerant as the medium which absorbs and removes heat from the space to be cooled and subsequently rejects that heat elsewhere, typically includes four components: a compressor, a condensing coil, an expansion valve (also called a thermal expansion valve), and an evaporator coil.~~

Vent Connector

The pipe that connects a combustion appliance to a vent or chimney.

Venting System

A passageway or passageways from a combustion appliance to the outdoors through which combustion gases pass.

Voids (insulation)

~~Areas where no insulation has been installed.~~

Wind Wash(ing)

~~Air intrusion between the insulation and the air barrier seriously compromises the effectiveness of the insulation in framed buildings. The long path exfiltration on the cold side of insulation allows moisture from the air to be deposited in the building assembly.~~

Weather Resistant Barrier (WRB)

~~Is designed to keep water from entering the building through the walls and is made up of several individual materials: house wrap or building paper (with weather resistive coating), flashings, sealants and tapes. When installed properly, these materials combine to protect the building from rain-induced moisture damage. If the WRB is sealed to block air flow it also contributes to the air barrier system of a home.~~

Work Scope

A set of written recommendations, including specifications detailing repairs and improvements to be made to a home; a work scope may include pre- and post-work performance testing and acceptance criteria.

Worst-Case Analysis

See the definition in standard ANSI/RESNET/ICC 301 Standard for the Calculation and Labeling of the Energy Performance of Dwelling and Sleeping Units using an Energy Rating Index~~A home energy rating from a specified home plan for which the minimum rated features of the home are configured to provide the poorest energy performance of the home (i.e. the largest HERS Index) when four ordinal home orientations and the least energy efficient minimum rated features for the specified home plan are considered by the Rating. A Worst Case analysis may use threshold diagnostic values to determine the least efficient minimum rated features for the specified home plan.~~