

**Results of Electronic Ballot of RESNET Board of Directors on Authorization of Proposed Standard Amendments on Interim Guidelines for Combustion Safety and Scope of Work (Attachment A) and Revision of Chapter 7 of the RESNET Standards (Attachment B) to be Submitted to the RESNET Public Review and Comment Process
May 31, 2010**

The following are the results of the electronic ballot of the RESNET Board:

1. *Shall the RESNET Board of Directors authorize the proposed revision of the proposed RESNET Interim Guidelines for Combustion Safety and Scope of Work to undergo the public review and comment process?*

Yes (20)

No (0)

Abstain (0)

Not Voting (0)

Ben Adams
Steve Byers
Brett Dillon
Charles Eley
Dennis Creech
Lance DeLaura
Richard Faesy
Philip Fairey
David Goldstein
Andy Gordon
Mark Jansen
Maci McDaniel
Lee O'Neal
Kelly Parker
Bill Prindle
Javier Ruiz
Orlo Stitt
Greg Thomas
Daran Wastchak
Barb Yankie

2. Shall the RESNET Board of Directors authorize the proposed revision of the proposed RESNET National Home Energy Audit Standards amendment to undergo the public review and comment process?

Yes (20)

No (0)

Abstain (0)

Not Voting (0)

Ben Adams
Steve Byers
Brett Dillon
Charles Eley
Dennis Creech
Lance DeLaura
Richard Faesy
Philip Fairey
David Goldstein
Andy Gordon
Mark Jansen
Maci McDaniel
Lee O'Neal
Kelly Parker
Bill Prindle
Javier Ruiz
Orlo Stitt
Greg Thomas
Daran Wastchak
Barb Yankie

Both proposals were authorized to be submitted to the RESNET public review and comment process.

Attachment A

Draft

RESNET Guidelines for Combustion Appliance Testing and Writing Scopes of Work

These interim guidelines are provided for RESNET Home Energy Raters who have been trained by a RESNET-accredited Training Provider on these protocols. These guidelines shall be followed by RESNET-accredited Raters performing combustion appliance testing or writing scopes of work for repairs. If the Rater has been trained and certified according to the Building Performance Institute (BPI) Standards, the Rater may follow the BPI protocols.

RESNET accredited Training Providers shall train HERS Raters on these protocols through either field exercise or through simulated conditions. A written exam administered by a RESNET-accredited Rater Trainer is also required, provided by RESNET. The test shall cover the content of these guidelines with a minimum of 25 questions. A minimum score of 80% is required to pass.

Prior to conducting any test that affects the operating pressures in the home, the Rater shall inquire whether a person that has environmental sensitivities (asthma, allergies, chemical sensitivity, etc.) is present in the home. If such a person is present, the Rater shall not perform such tests without written disclosure from the affected party (or responsible adult). The written disclosure shall state (at a minimum) that “during the period of testing, some amount of dust, particles, or soil gases already present in the home may become airborne.” Without a signed disclosure, the Rater shall either reschedule the test for a time when they will not be present, or ask them to leave the home during the testing process. The Rater shall also inquire as to the presence of pets which may potentially be affected by testing procedures.

Gas Leakage Testing

If there is a noticeable odor indicating gas buildup within the home, the occupants and Rater shall leave the house and the appropriate authorities and utility providers shall be notified from outside the home. The Rater should use a gas detector upon entry into the home to detect the presence of natural gas. If gas is suspected or confirmed, ensure that switches are not operated while exiting and no ignition concerns are present. The audit shall not proceed until the proper authorities have deemed it safe to re-enter the home.

If there is no noticeable odor indicating gas buildup within the home, the Rater shall determine if there are gas leaks in the fittings and connections of natural gas appliances within the home and natural gas/liquid propane supply lines following these protocols.

Equipment needed:

- Combustible gas detector capable of measuring 20 ppm
- Leak detection fluid (non-corrosive)

Inspect all fittings and joints in supply lines and appliance connectors and confirm suspected leaks with leak-detection fluid. Identify for repair or replacement any kinked, corroded or visibly worn flexible gas lines and any flexible connectors manufactured prior to 1974.

Worst Case Depressurization Test

This test procedure measures the pressure in the Combustion Appliance Zone (CAZ) and provides visual evidence of spillage potential.

Determine if there is likelihood for combustion appliances to have spillage within the building envelope when exhaust fans are operating by following these protocols.

1.1. Check the combustion appliance zone for the presence of flammable or explosive material near a combustion source.

1.2. Visually inspect venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion or other deficiencies that could cause an unsafe condition.

1.2.1. Inspect burners and crossovers for blockage and corrosion.

1.2.2. Inspect furnace heat exchangers for cracks, openings or excessive corrosion.

1.3. Close all the exterior doors and windows of the home.

1.4. Close fireplace damper(s) if fireplace is present.

1.5. Close any interior doors between the CAZ and the remainder of the house, ensuring that all vented appliances and exhaust fans have been turned off.

1.6. Measure the baseline pressure difference between the CAZ with respect to (WRT) outside (ambient) and baseline CO levels. Set the gauge to read pressure and record the baseline pressure.

1.7. Turn on all exhaust fans in the home (kitchen range hood, bath exhaust, clothes dryer, etc.) that exhaust air outside the building envelope.

1.8. Record pressure in CAZ with respect to Outside.

1.9. Turn on the air handler. Record pressure in CAZ with respect to outside. If air handler makes the CAZ more positive (or less negative), turn it off. If the air handler is kept on, close interior doors to any rooms that have no return registers.

1.10. If fireplace is present install blower door and set to exhaust 300 CFM to

simulate fireplace in operation.

1.11. Record net change in pressure difference within the CAZ WRT outside between baseline and worst case depressurization conditions. Record the position of doors and conditions of fans and air handler. When CAZ pressure is lower (more negative) than the limits specified below, the scope of work shall specify remediation through pressure balancing, duct sealing, and/or other pressure-relief measures, as applicable.

1.12. Turn on vented combustion appliance with the smallest Btu capacity. Operate appliance for 5 minutes then measure CO levels according to the carbon monoxide test procedure below, and check appliance draft using a smoke pencil at the draft diverter. If the smoke moves away from the draft diverter toward the appliance and not up the flue vent, the appliance has spillage under worst case depressurization. Record if there is any spillage and record CO levels. When spillage occurs or CO exceeds the limits specified below, the scope of work shall specify remediation, including equipment repair or replacement, and/or building pressure remediation, as applicable.

1.13. Turn on all the other combustion appliances, one at a time, within the CAZ and repeat step 1.12 on each of them.

1.14. If spillage occurs in any appliance(s) under worst case depressurization, retest that appliance(s) under natural conditions.

1.14.1. Turn off the combustion appliances.

1.14.2. Turn off the exhaust fans.

1.14.3. Open the interior doors.

1.14.4. Let the vent cool.

1.14.5. Test CO and spillage under natural conditions. If the test failed under worst-case, but passes under natural conditions, the scope of work shall specify building pressure remediation, as applicable.

1.14.6. If an appliance fails under natural conditions, the rater shall inform the homeowner of the problem, and the scope of work shall specify remediation, including equipment or vent system repair or replacement, as applicable.

CAZ Pressure Limits:

- -50 Pa for direct-vent or power-vented appliances,
- -15 Pa for pellet stoves with exhaust fans and sealed vents
- -5 Pa for Atmospheric vented oil and gas system, oil power burner; fanassisted or induced-draft gas; solid-fuel–burning appliance other than pellet stoves with exhaust fans and sealed vents

If ambient CO levels are higher than 35 ppm within the CAZ, stop the test and turn the combustion appliances off. Open all the exterior doors and windows. It is strongly suggested that the Rater not enter the home until the CO levels drop below 35 ppm, but the Rater should use their best judgment on when to re-enter the home.

The combustion appliance causing the increase in CO levels must be repaired by a qualified technician prior to completing the combustion appliance tests, unless the scope of work calls for replacement of the appliance(s).

Carbon Monoxide Testing

Test all spaces (including attached garages, crawlspaces, basements) containing combustion appliances for carbon monoxide using the following protocols.

1. CO testing of vented combustion appliances for carbon monoxide (CO) inside the unit is not required.
2. CO testing of ambient air shall be performed continuously while performing a Worst Case Depressurization Test.
3. Equipment used shall:
 - Be capable of measuring carbon monoxide (CO) levels from 0 to 2,000 ppm (parts per million)
 - Have a resolution of 1 ppm
 - Have an accuracy rate of + 5 ppm
 - Be calibrated annually by the manufacturer (or using manufacturer's instructions) and evidence of the calibration shall be submitted to the Rating Provider Quality Assurance Designee
4. Zero the carbon monoxide meter outside the building away from any combustion outlets or automobile traffic areas.
5. Take a measurement of CO levels within the home upon entering to establish a baseline. Do not measure near combustion appliances while they are operating.
6. For atmospherically-vented appliances:
 - 6.1. Take a measurement of vent gases upstream (before they reach) the draft diverter.
 - 6.2. Appliance must operate for at least 5 minutes before taking sample.
 - 6.3. Take sample during worst-case depressurization test and record the CO level.
7. For direct- or power-vented appliances:
 - 7.1. Sample must be taken at vent termination.
 - 7.2. Appliance must operate for at least 5 minutes before taking sample.
 - 7.3. Take sample during worst-case depressurization test and record the CO level.
8. For LP- or natural gas ovens:
 - 8.1. Open a window or door to the outside.
 - 8.2. Remove any foil or cooking utensils within the oven.

- 8.3. Verify that the oven is not in self-cleaning mode.
 - 8.4. Turn oven on to highest temperature setting.
 - 8.5. Close the oven door and begin monitoring the CO levels in the kitchen, 5 feet from the oven at countertop height. Record CO levels.
 - 8.6. Measure the CO levels within the oven vent.
 - 8.6.1. Samples must be taken while burner is firing.
 - 8.6.2. Operate burner for at least 5 minutes while sampling flue gases.
 - 8.6.3. If CO levels are higher than 100 ppm, repeat the flue gas sampling until the CO levels stop falling.
 - 8.6.4. Record the lowest CO reading in ppm and turn off oven.
- If measured CO levels are higher than 100 ppm (200 for oven), or an appliance fails to meet manufacturer's specifications for CO production (whichever is higher), the scope of work shall specify replacement or repair of the appliance, and the homeowner shall be notified of the need for service by a qualified technician.

Scopes of work for contractors

All work must meet applicable codes and regulations for the jurisdiction. When air sealing is being performed the scope of work shall specify CAZ depressurization testing to be performed at the end of each workday. The scope of work for recommended improvements will be determined by the Rater and shall be based upon the findings of the assessment, the client's budget, and priorities identified during combustion appliance testing, subject to health and safety requirements.

The scope of work shall clearly identify for the client any remedial actions which require prompt attention, affect safety, or require a licensed trade. The scope of work shall provide sufficient specification that the client may obtain reasonably comparable bids from alternative sources for making recommended improvements.

All scopes of work shall include this statement: **"The estimated energy use and savings information contained in the audit report does not constitute any guarantee or warranty of actual energy cost or usage."**

The scope of work shall be developed based on the rater's diagnosis and analysis. Emphasis shall be on:

- bringing air distribution system components inside the building enclosure when it is feasible, or sealing and insulating ducts when it is not
- improving airflow and total HVAC system efficiency as applicable
- upgrades to the building enclosure as applicable
- improvements to lighting and appliances as applicable

The scopes shall reflect the "house as a system" approach, recognizing that measure interaction. The following statement shall be included whenever a fireplace or combustion appliance is located within the building enclosure: "This scope of work is not a list of recommendations that may be

implemented independently; any exclusions or variations to this scope may increase the risk of flue gas spillage, back-drafting, carbon monoxide production and/or moisture problems within the home.” When specifying equipment replacement, new equipment sizing shall be based on the proposed, upgraded condition of the building enclosure and duct system.

The scope of work shall call for post-work combustion appliance testing in accordance with these guidelines when any work affecting enclosure or duct tightness, or building pressures, is specified.

Scope of work: Carbon Monoxide Testing

If ambient CO levels are higher than 35 ppm during normal appliance operation, turn off the appliance, ventilate the space, and evacuate the building. The building may be reentered once ambient CO levels have gone below 35 ppm.

The source of the CO must be repaired or replaced and the problem corrected prior to commencing work on other tasks on the scope of work, unless remediation of the CO production is specifically related to one or more of those tasks (such as duct repairs that will correct a large negative pressure in the CAZ).

If there are combustion appliances within the building envelope, a carbon monoxide detector should be installed in the main area of each floor according to manufacturer’s recommendations, typically in the hallway outside each bedroom area.

Scope of work: Worst Case Depressurization Testing

If the results of the Worst Case Depressurization Test indicate the potential for backdrafting by failing the CAZ pressure limits or spillage test, remediation of the failure must be addressed in the scope of work, through one or more of the following (as applicable): targeted air- and duct-sealing, room pressure balancing, exhaust fan makeup air, or appliance replacement (with power- or direct-vented equipment). As an alternative, the combustion appliance zone may be isolated by creating a sealed combustion closet containing the combustion appliances that has the proper amount of combustion air supplied to it according to the applicable version of the IRC. Adequate sealing for isolation purposes shall include air sealing and duct sealing (especially of adjacent platform or cavity return ducts) and confirmed by another CAZ depressurization test.

The scope of work should specify replacement of atmospheric-vented combustion appliances with high-efficiency sealed combustion, direct vent, or power vented appliances when feasible.

If the home has unvented combustion appliances, the rater shall recommend they be disconnected and replaced with vented combustion appliances.

If unvented combustion appliances are not replaced with vented combustion

appliances or electric appliances, the scope of work shall not specify measures that affect the air tightness of the envelope, including air sealing, sidewall insulation, or window replacements. Duct sealing outside the thermal envelope may be specified in IECC climate zones 1-3.

Rater Referenced Standards

These referenced standards provide guidance for the Rater in the performance of their role as an auditor or home energy rater (diagnostic testing, analysis, writing scopes of work).

1. 2006 Mortgage Industry National Home Energy Rating Systems Standards, published by the Residential Energy Services Network, latest version, www.resnet.us
2. ASHRAE/ANSI Standard 119-1998 RA-2004 Air Leakage Performance for Detached Single-Family Residential Buildings, published by the American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc., www.ashrae.org
3. ASHRAE/ANSI Standard 152-2004 Method of Test for Determining the Design and Seasonal Efficiencies of Residential Thermal Distribution Systems, published by the American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc., www.ashrae.org
4. ASTM E1998-02(2007) "Standard Guide for Assessing Depressurization-Induced Backdrafting and Spillage from Vented Combustion Appliances", published by ASTM International, www.astm.org
5. ASTM E1827-96(2007) "Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door", published by ASTM International, www.astm.org
6. ASTM E1554-07 "Standard Test Methods for Determining Air Leakage of Air Distribution Systems by Fan Pressurization", published by ASTM International, www.astm.org
7. Reflective Insulation, Radiant Barriers and Radiation Control Coatings, published by the Reflective Insulation Manufacturers Association- International, www.rimainternational.org
8. Protocols for Verifying HVAC Systems to the ACCA Quality Installation Standard, published by the Air Conditioning Contractors of America, www.acca.org (currently in draft)
9. Verifying ACCA Manual J® Procedures, published by the Air Conditioning Contractors of America, www.acca.org
10. Verifying ACCA Manual S® Procedures, published by the Air Conditioning Contractors of America, www.acca.org
11. Verifying ACCA Manual D® Procedures, published by the Air Conditioning Contractors of America, www.acca.org
12. NAIMA Fibrous Glass Duct Installation Check List, published by the North American Insulation Manufacturers Association, www.naima.org
13. AHRI Certification Directory, published by the Air-conditioning, Heating and Refrigeration Institute, www.ahridirectory.org

Contractor Scope of Work Referenced Standards

These referenced standards should be used to provide guidance for the contractor to perform the scope of work.

1. International Residential Code for One- and Two-Family Dwellings- 2006, published by the International Code Council, Inc., www.iccsafe.org
2. International Energy Conservation Code- 2006, published by the International Code Council, Inc., www.iccsafe.org
3. International Mechanical Code- 2006, published by the International Code Council, Inc, www.iccsafe.org
4. International Fuel Gas Code- 2006, published by the International Code Council, Inc., www.iccsafe.org
5. ANSI/ACCA Standard 5 QI-2007 HVAC Quality Installation Specification, published by the Air Conditioning Contractors of America, www.acca.org
6. Manual J, Residential Load Calculation, 8th edition, published by the Air Conditioning Contractors of America, www.acca.org
7. Manual D, Residential Duct Systems, 3rd edition, published by the Air Conditioning Contractors of America, www.acca.org
8. Manual S, Residential Equipment Selection, published by the Air Conditioning Contractors of America, www.acca.org
9. Manual RS, Comfort, Air Quality, & Efficiency by Design, published by the Air Conditioning Contractors of America, www.acca.org
10. Manual T, Air Distribution Basics, published by the Air Conditioning Contractors of America, www.acca.org
11. Manual H, Heat Pump Systems, published by the Air Conditioning Contractors of America, www.acca.org
12. Manual G, Selection of Distribution Systems, published by the Air Conditioning Contractors of America, www.acca.org
13. ASHRAE Standard 62.2 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings, published by the American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc., www.ashrae.org
14. ASHRAE Standard 52.2 Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size , published by the American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc., www.ashrae.org
15. ASTM Standard C1015-06 "Standard Practice for Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation", published by ASTM International, www.astm.org
16. ASTM Standard C1320-05 "Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction", published by ASTM International, www.astm.org
17. ASTM Standard C727-01 (2007)e1 "Standard Practice for Installation and Use of Reflective Insulation in Building Constructions", published by ASTM International, www.astm.org
18. ASTM Standard C1158-05 "Standard Practice for Installation and Use of Radiant Barrier Systems in Building Constructions", published by ASTM International, www.astm.org

19. ASTM Standard E2112-07 “Standard Practice for Installation of Exterior Windows, Doors and Skylights”, published by ASTM International, www.astm.org
20. Flexible Duct Performance and Installation Standards 4th edition, published by the Air Diffusion Council, www.flexibleduct.org
21. Fibrous Glass Duct Construction Standards, 5th edition, published by the North American Insulation Manufacturers Association, www.naima.org
22. FTC Trade Regulation Rule 16 CRF 460, Labeling and Advertising of Home Insulation, published by the Federal Trade Commission, www.ftc.gov

Attachment B

Date: May 3, 2010

RESNET Accreditation Application Process

Proponent: RESNET National Energy Audit Standards Working Group

Proposed Changes:

Chapter Seven – RESNET National Standards for Home Energy Audits
Remove in entirety and replace with:

Chapter Seven RESNET Standards

700 RESNET NATIONAL STANDARD FOR HOME ENERGY AUDITS

701 GENERAL PROVISIONS

701.1 Purpose

The provisions of this Standard are intended to define a framework for a home energy audit process.

A certified auditor, an accredited Provider and/or a program will apply this Standard to improve the energy performance of existing homes through uniform, comprehensive home energy surveys, audits and ratings for existing residential buildings. This Standard is intended to result in investments by building owners that produce the following outcomes:

- Increase the energy efficiency of homes;
- Increase the comfort of homes;
- Increase the durability of homes;
- Ensure that energy improvement recommendations are portrayed with reasonable and consistent projections of energy savings;
- Reduce the risk that energy improvement recommendations will contribute to health, safety, or building durability problems; and
- Reduce waste and pollution, protecting the environment.

701.2. National Standard for Home Energy Audits.

There are 3 categories of existing-home performance assessments defined in this standard:

1. Home Energy Survey
 - a. On-Line Home Energy Survey
 - b. Professional Home Energy Survey
2. Building Performance Audit
3. Comprehensive HERS Rating

701.3 Relationship to Other Standards

This Chapter is a companion Chapter to the 2006 RESNET Mortgage Industry National Home Energy Rating System Standard as promulgated and maintained by the Residential Energy Services Network (RESNET) and recognized by the mortgage industry and programs promoting the improved energy performance of buildings.

701.4 Relationship to State Law

This Standard specifically recognizes that some state laws or regulations have additional requirements to those specified in this document. To the extent that such state laws or regulations differ from these Standards, state law or regulation must govern.

701.5 Scope

This Home Energy Audit Standard will address RESNET Providers for each area of home inspection and applicable procedures, types of home inspections, certifications of the inspectors, and summary of requirements for each type of inspection and the reports to accompany each type of inspection.

701.5.1 Application of Standards

This Standard applies to existing site-constructed or manufactured, single- and multi-family residential buildings three stories or less in height.

702 DEFINITIONS AND ACRONYMS

Auditor – for the purpose of this document an “*auditor*” is generic name for either a Home Energy Survey Professional (HESP) or Building Performance Auditor (BPA) and is distinguished from a certified “**Rater**” who may be a HERS Rater or a Comprehensive HERS Rater

Building Performance Audit - A level of the RESNET Home Energy Audit that includes the evaluation, diagnosis and testing of an existing-home’s performance and the generation of a prioritized work scope for cost-effective energy saving measures and features.

Building Performance Auditor (BPA) - An individual who is certified by a RESNET accredited Home Energy Audit (HEA) Provider to conduct the evaluation, diagnosis and testing of an existing home’s performance and provide a prioritized work scope for cost-effective energy saving measures and features to the homeowner. As the house is a system, a BPA is competent in building analysis, envelope/shell evaluation and work scope preparation.

BPA Trainer – A individual certified by RESNET as competent to teach HESP and BPA course curriculum by having passed the 100-question BPA Trainer exam with a minimum score of 90% and teaches under the auspices of a RESNET accredited HEA-Training Provider.

Combustion Appliance Zone (CAZ) - Any area within a house containing a combustion appliance that can be closed off from another area.

Comprehensive HERS Rater (CHERS Rater) - An individual who is certified by an accredited

HERS Provider to inspect, diagnose and test an existing-home in order to evaluate each of the minimum rated features established by RESNET, prepare a comprehensive HERS rating according to Chapters One and Three of the RESNET Mortgage Industry National Home Energy Rating Standards and provide a prioritized work scope for cost-effective energy saving measures and features to the homeowner. (A certified Comprehensive HERS Rater is also qualified to perform HERS Ratings on new homes. A HERS Rater is qualified to perform ratings on both new and existing homes but cannot perform the Comprehensive HERS Rating until completing additional training as required by RESNET.)

Comprehensive HERS Rating - A level of the RESNET Existing-Home Energy Audit that includes the evaluation, diagnosis and testing of the minimum rated features established by RESNET, the preparation of an energy rating according to Chapters One and Three of the RESNET Mortgage Industry National Home Energy Rating Standards and provide to the homeowner a prioritized work scope of cost-effective energy saving measures and features.

Data Collection - The gathering of information on building energy features, energy use history and other relevant building and building operation information

Diagnostic Testing - The use of building performance-testing equipment (e.g. blower door, duct tightness testing, flow measurements, infrared cameras, combustion analyzers, CO monitors, etc.) to measure, assess and document specific building performance characteristics.

Energy Saving Measure or Feature - Any material, component, device, system, construction method, process or combination thereof that will result in cost-effective reduction in end-use energy consumption.

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.

HEA Provider – See Home Energy Audit Provider

HEA-Training Provider – An organization accredited by RESNET to provide Home Energy Audit (HEA) training courses (including Home Energy Survey Professional (HESP) and/or Building Performance Auditor (BPA) curriculum) and proctor HESP and/or BPA exams. A HEA-Training Provider cannot provide HERS Rater Training unless also certified as a HERS Training Provider.

HERS - Home Energy Rating System

HERS Index - A numerical integer value produced by a Home Energy Rating that represents the relative energy use of a Rated Home as compared to 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.

HERS Provider - An organization accredited by RESNET in accordance with section 102 of the

Mortgage Industry National Home Energy Rating Systems Standards to develop, manage, and operate a home energy rating system.

HERS 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).

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.

Home Performance Assessment - Defined by this standard as one of three levels of energy assessment of a home, including Home Energy Survey, a Building Performance Audit and Comprehensive HERS Rating.

Home Energy Rating System or HERS® - The materials and procedures needed to operate a home energy rating program including, but not limited to: marketing materials, training materials, publications, rating software, quality control system, data collection and maintenance systems, agreements, data collection sheets, home owner reports, and other related materials and services.

Home Performance with Energy Star (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.

Home Energy Audit (HEA) Provider - An organization accredited by RESNET in accordance with Section 703.1.2 of the *Mortgage Industry National Home Energy Rating Systems Standards* to certify individuals to perform Home Energy Surveys and/or Building Performance Audits in compliance with this standard. The HEA Provider is also tasked to maintain the quality assurance of the Home Energy Audit process. If providing certifications for Building Performance Auditors, compliance with Section 703.2.5 is also required.

Home Energy Survey - A Home Energy Survey approved by RESNET that will take one of two forms: a computerized *On-Line Home Energy Survey* performed by the owner or occupant, or a *Professional Home Energy Survey* conducted onsite by a certified Home Energy Survey Professional.

Home Energy Survey Professional (HESP) - An individual certified by an accredited Home Energy Audit (HEA) Provider to conduct onsite Professional Home Energy Surveys.

Home Energy Survey (HES) Software - computerized procedure approved by RESNET or the U.S. DOE for entering data collected as part of a Professional Home Energy Survey or DOE home energy labeling program and generating a report for the homeowner. HES software does not have the capability of home performance modeling or specific energy savings calculations.

On-Line Home Energy Survey - A basic energy review of a home using an internet-based tool or software performed by the owner or the occupant.

Professional 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 will include data be collected 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 of audit if it is determined that the home needs further analysis, and the homeowner is motivated to invest in improvements.

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

Performance Software – A computerized procedure for conducting an analysis and reporting of proposed energy savings measures and developing an appropriate work scope that is either approved by DOE, accredited by RESNET or specified by a HPwES sponsor or similar program.

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 score for a home.

RESNET - Residential Energy Services Network

RESNET Qualified Contractor – A home performance contractor who has been qualified by RESNET to complete home performance improvement work in concert with a Building Performance Auditor or Comprehensive HERS Rater and in compliance with work scope requirements defined in the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.

Texas HERO Home Energy Audit Standard – A Standard promulgated by Texas HERO (www.txhero.org) and approved by the RESNET Board of Directors May 4, 2009, as an equivalent home performance certification program.

703 HOME ENERGY AUDIT PROVIDER AND BUILDING PERFORMANCE AUDIT PROVIDER ACCREDITATION CRITERIA

703.1 Home Energy Audit (HEA) Provider and Building Performance Audit (BPA) Provider
Both a HEA and a BPA Provider must be accredited in accordance with the following provisions.

703.1.1 A Provider must be accredited by RESNET as specified in Section 703.1.2 of the Mortgage Industry National Home Energy Rating Systems Standards.

703.1.2 Home Energy Survey Professional and Building Performance Auditor Certification Standard. Certification and recertification of Home Energy Survey Professionals (HESPs) and Building Performance Auditors (BPAs) must be accredited by HEA Providers, who must abide by the following provisions:

703.1.2.1 A Home Energy Audit (HEA) Provider must provide documentation that their HESPs and/or BPAs under their umbrella meet the following certification provisions:

703.1.2.1.1 Performance evaluation of ability to perform accurate Home Energy Surveys and/or Building Performance Audits in accordance with sections 704 and 705. Each HESP and

BPA must complete a probationary period where close supervision is provided by the Home Energy Audit Provider's QA designee. The probationary period covers a minimum of three Home Energy Surveys and/or Building Performance Audits (as applicable) after which the QA Designee must determine if additional training is needed.

703.1.3.1.2 Continuing Education. HESPs must have 12 hours of RESNET approved continuing education and training units for every three year period. BPAs must have 16 hours of RESNET approved continuing education and training units for every three year period

703.1.3.1.3 Testing. All certified HESPs must pass the national Home Energy Survey Professional (HESP) online test administered by RESNET with a score of 75. Each certified BPA must pass the national Building Performance Auditor (BPA) online test with a score of 80 administered by RESNET and pass any additional field evaluations to determine competency to perform air leakage and building pressurization diagnostics and combustion safety procedures as required in Chapter Eight RESNET Standards.

703.1.3.1.4 Recertification of individuals by the HEA Provider must occur every 3 years.

703.1.3.1.5 Agreements. As a condition of certification, each HEA and BPA Provider must ensure that each certified individual enters into a written agreement with the Provider to provide the applicable field verification services in compliance with these standards. An unexecuted copy of the written agreement must be provided to RESNET with the Provider's accreditation application, and again within 60 days of making changes to the agreement. The written agreement must, at a minimum require Auditors to:

703.1.3.1.5.1 Provide audit verification services in compliance with these standards;

703.1.3.1.5.2 Provide accurate and fair Professional Surveys or Audits; and

703.1.3.1.5.3 Comply with the RESNET Code of Ethics. The RESNET Code of Ethics must be attached to the written agreement.

703.1.4 Minimum Standards for HEA and BPA Provider Operation Policies and Procedures must be submitted in written form to RESNET for approval, and must at a minimum provide for the following:

703.1.4.1 Written conflict of interest provisions that prohibit undisclosed conflicts of interest, but may allow waiver with advanced disclosure. The "Standard Disclosure" form adopted by the RESNET Board of Directors must be completed for each home that receives a Home Energy Survey or Building Performance Audit and must be provided to the client and made available to the homeowner. Each form must accurately reflect the proper disclosure for the home that it represents. For the purpose of completing this disclosure, "Auditor's employer" includes any affiliate entities. Recognizing that a number of different relationships may exist among the auditor or the auditor's employer, other contractors that may complete work on the home, and the survey client and/or homeowner, the HEA and BPA Provider must ensure that all disclosures are adequately addressed by the Provider's quality assurance plan, in accordance with the relevant quality assurance provisions of the standards.

703.1.4.2 Written Auditor discipline procedures that include progressive discipline for probation, suspension, and decertification.

703.1.4.3 A written audit quality control process including, at a minimum the following:

703.1.4.3.1 HEA-Provider Quality Assurance Designee

703.1.4.3.1.1 A HEA Provider must designate an officer, employee, or contractor to be responsible for quality assurance within the organization. This definition does not prohibit a BPA Quality Assurance Designee from having a qualified certified BPA perform the required quality assurance file review functions. The responsibilities of the designee must include:

703.1.4.3.1.1.1 Maintenance of quality assurance files

703.1.4.3.1.1.2 Review of audits during the auditor's probationary period

703.1.4.3.1.1.3 Monitoring of Surveys and Audits performed

703.1.4.3.1.2 The designated officer, employee, or contractor responsible for quality assurance for Home Energy Audit (HEA) Providers must demonstrate sufficient experience with the knowledge base and skills given in Section 705.1 of the Standard to review the work of certified Auditors. Proof of qualification must be submitted with an application for accreditation. Sufficient experience must be demonstrated by either of the following:

703.1.4.3.1.2.1 Certification as a Rating Provider Quality Assurance Designee, or

703.1.4.3.1.2.2 Certification as a BPA Trainer by having passed the 100 question BPA Quality Assurance Designee/Trainer Exam with a minimum score of 90%.

703.1.4.3.2 The HEA Provider's quality assurance designee must be responsible for the internal review of Home Energy Audits submitted by its Auditors, including:

703.1.4.3.2.1 Review of the Audits conducted during the Auditors probation period. Prior to certifying a candidate, the HEA and BPA Providers must review at least three probationary Home Energy Surveys or Building Performance Audits (as applicable) performed by the Auditor within 12 months.

703.1.4.3.2.2 Review of survey and audit reports. For each Auditor, the HEA Provider's quality assurance designee or his/her delegated individual must annually evaluate a minimum of 10% of each Auditor's reports. The HEA and BPA Providers must resolve any problems detected during these reviews.

703.1.4.4 Auditor Registry. The HEA and BPA Provider must maintain a registry of all of its certified Auditors. The specified Provider must also keep on file the names and contact information for all certified Auditors, including company name, mailing address, voice phone number, fax number, and email address. Upon request, the HEA Provider must provide to RESNET its registry of certified Auditors.

703.1.4.5 Complaint Response Process. Each HEA Provider must have a system publicly available for receiving complaints. The HEA Provider must respond to and resolve complaints related to Home Energy Surveys and/or Building Performance reports within a 3-day period. HEA Providers must ensure that Auditors inform clients about the complaint process by publicizing the web address of the complaint resolution process. Each HEA Provider must retain records of complaints received and responses to complaints for a minimum of three years after the date of the complaint.

703.1.5 Additional Building Performance Audit Provider Duties Related to Oversight of Building Performance Auditors (BPAs)

703.1.5.1 Certification of Performance Testing Proficiency. The HEA Provider is responsible for certifying that each BPA has successfully completed the following:

703.1.5.1.1 Exhibited sufficient comprehension of the knowledge base stated in Section 706.2 to pass the RESNET BPA online exam

703.1.5.1.1.1 BPA candidates who have NOT previously passed the 50 question RESNET HESP must take and pass the 50 question BPA exam with a minimum score of 80%

703.1.5.1.1.2 BPA candidates who have previously taken and passed the 50 question RESNET HESP online exam with a minimum score of 75%, must take and pass an abbreviated 25 question BPA exam and pass with a minimum score of 80%

703.1.5.1.2 Completed a combined total of 20 hours of RESNET approved training in Pressure Diagnostics, Combustion Appliance Zone (CAZ) Testing and Work Scope Requirements which includes field training and a field proficiency demonstration as defined in the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.

703.1.5.2 Ongoing Proficiency Testing. The HEA Provider's quality assurance designee must require each BPA to perform a Performance Testing Proficiency demonstration at least once every two years. Proficiency evaluation will be performed by an individual deemed qualified by the HEA Provider's quality assurance delegate and must include proper demonstration of a CFM50 Blower Door Test, a Duct Leakage Test and Combustion Appliance Spillage Test under CAZ Worst Case Depressurization conditions and understanding of the results. Proficiency evaluations must be based on the Performance Testing Protocols defined in the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.

704 COMPREHENSIVE HERS PROVIDER ACCREDITATION CRITERIA

704.1 Comprehensive HERS Providers must be accredited by RESNET in accordance with the provisions of Section 102 of the Mortgage Industry National Home Energy Rating Systems Standards.

704.1.2 Existing accredited HERS Providers must submit to RESNET an addendum to their procedures addressing qualifications and responsibilities related to providing oversight for Comprehensive HERS Raters.

704.2 In addition to the meeting the qualifications for becoming a certified HERS Rater, a **Comprehensive HERS Rater** must be certified by a HERS Rating Provider as having completed 3-hours of work scope training detailing the items in Section 705.2.7 and the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.

704.3 Each **Comprehensive HERS Rater** must meet the certification requirements for Pressure Diagnostics and CAZ Testing as defined in the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.

705 NATIONAL HOME ENERGY AUDIT PROCEDURES

705.1 Home Energy Survey

The purpose of the Home Energy Survey is to determine the general condition of the home with respect to energy performance and the homeowner's potential willingness to improve the home's energy performance. The Home Energy Survey must produce a report that shows a general range of a home's energy efficiency based on specific criteria (insulation, equipment age, general condition, energy usage and costs) and a lookup matrix based on regional norms and climate, as approved by RESNET. The Home Energy Survey is not required if the homeowner wishes to directly pursue a Building Performance Audit or a Comprehensive HERS Rating. The Home Energy Survey will take one of two forms: a RESNET approved computerized On-Line Home Energy Survey performed by the owner or occupant, or a Professional Home Energy Survey conducted by a certified Home Energy Survey Professional.

705.1.1 On-Line Home Energy Survey. The On-Line Home Energy Survey must collect substantially the same data and information and must be subject to the same limitations as the Professional Home Energy Survey. On-line Home Energy Survey programs must be hosted by a RESNET accredited HEA Provider or another organization approved by RESNET and the on-line program report must be approved by RESNET.

705.1.2 Professional Home Energy Survey. The Home Energy Survey must include on-site visual inspection of the energy features of the dwelling unit, and documentation of its general condition, including envelope features and ages; equipment types, characteristics and ages; and,

appliance and lighting characteristics. Where available, the Professional Home Energy Survey must include a review of utility use and billing history. The Home Energy Survey is a visual inspection only and does not include the use of a blower door, duct leakage test, an infrared camera or other test equipment. Home Energy Survey Professionals may also use home energy survey and labeling software programs approved by RESNET or the U.S. Department of Energy. A homeowner is not required to have a Professional Home Energy Survey prior to having a Building Performance Audit or Comprehensive HERS Rating.

705.1.2.1 The Home Energy Survey Professional (HESP) must interview the homeowner regarding energy and comfort problems. The HESP must explain the limitations of the Home Energy Survey and provide an overview of the Professional Home Energy Survey, the Building Performance Audit and Comprehensive HERS Rating. The interview must include, but is not limited to, the following subject areas:

705.1.2.1.1 Comfort complaints, including areas of the home that are too hot or too cold.

705.1.2.1.2 Energy billing concerns.

705.1.2.1.3 The potential for the homeowner to move to a Building Performance Audit or Comprehensive HERS Rating.

705.1.2.1.4 Interest in potential home energy performance improvements.

705.1.2.2 The Home Energy Survey Professional must inform the homeowner of low cost/no cost improvements that can be implemented by the homeowner.

705.1.2.3 The Home Energy Survey Professional must request copies of utility bills or written permission to obtain the energy use information from the utility company, and use them to produce an estimate of generalized end-uses (base, heating, and cooling).

705.1.2.4 The Home Energy Survey Professional must advise the homeowner on where to locate qualified individuals (including the RESNET) website to conduct a Building Performance Audit or a Comprehensive HERS Rating and/or RESNET Qualified Contractors to complete the work on the home.

705.1.2.5. Minimum Procedures for a Professional Home Energy Survey:

705.1.2.5.1 The Home Energy Survey Professional (HESP) must complete a standardized survey form approved by the Residential Energy Services Network (RESNET). The survey form will require the HESP to visually review the home to determine, measure or estimate the following features:

705.1.2.5.1.1 R-values of wall/ceiling/floor insulation

705.1.2.5.1.2 Square footage and approximate age of home

705.1.2.5.1.3 U-factors and SHGC of windows: glazing type(s) and frame material(s)

705.1.2.5.1.4 Type, model number, efficiency and location of heating/cooling system(s)

705.1.2.5.1.5 Type of ductwork, location and R-value of duct insulation, and any indications of previous duct sealing

705.1.2.5.1.6 Type of foundation is crawl, basement, or slab

705.1.2.5.1.7 Checklist of common air-leakage sites indicating likely opportunities for leakage reduction

705.1.2.5.1.8 Estimated age and efficiency of major appliances such as dishwashers, refrigerators, freezers and washing machines

705.1.2.5.1.9 Number and type of hardwired light fixtures and screw-in bulbs in portable lamps suitable for energy efficient re-lamping

705.1.2.5.1.10 Visual indications of condensation and common moisture problems such as such as roof leaks, foundation leaks, and ground-water intrusion and plumbing leaks including any signs of mold, mildew, insect damage, efflorescence, and stains.

705.1.2.5.1.11 Presence and location of exhaust fans, and determination of whether they are

drawing adequately and vented outdoors

705.1.2.5.1.12 Number and type of water fixtures (e.g. faucets, showerheads)

705.1.2.5.1.13 Presence and type(s) of combustion equipment; identification of visually identifiable evidence of flame rollout, blocked chimney, and corrosion; check for or missing or damaged vent connectors

705.1.2.5.1.14 Any identified and/or anticipated fire, health, and safety hazards related to energy retrofit work.

705.1.2.1.15 Whether or not an indoor radon test has been performed in the past two years; if not, inform customers about potential radon risk and recommend radon testing in accordance with EPA Radon Measurement in Homes Protocol.

705.1.2.5.2 The following elements are outside the scope of a Professional Home Energy Survey:

705.1.2.5.2.1 The use of blower doors, duct leakage test equipment or an infrared camera.

705.1.2.5.2.2 Any other diagnostic testing of the home

705.1.2.5.2.3 Quantification of any levels of air tightness, duct tightness, or ventilation amounts.

705.1.2.5.2.4 Energy savings estimates will only be generalized and presented along with the qualification that a Building Performance Audit or Comprehensive HERS Rating must be obtained to calculate energy savings estimates.

705.1.2.5.2.5 Combustion Appliance Zone (CAZ) testing

705.1.2.6 Minimum Professional Home Energy Survey Report Documentation

705.1.2.6.1 At the completion of the Professional Home Energy Survey the Home Energy Survey Professional must provide the homeowner a standardized report approved by the Residential Energy Services Network (RESNET), signed and dated by the Home Energy Survey Professional. The report at a minimum must provide information to the homeowner that addresses:

705.1.2.6.1.1 All data collected in accordance with Section 704.1.2.5.1, above

705.1.2.6.1.2 Whole-house solutions overview of how the home works as a system and how to prioritize actions.

705.1.2.6.1.3 The quality of installation of HVAC equipment including information on: proper sizing of equipment, duct sealing, and refrigerant charge and air flow.

705.1.2.6.1.4 The quality of the building envelope air sealing and proper levels of insulation.

705.1.2.6.1.5 An overview of ENERGY STAR or better products and appliances.

705.1.2.6.1.6 Information regarding access to a Building Performance Audit or Comprehensive HERS Rating.

705.1.2.6.1.7 Non-energy benefits of improving the energy efficiency of the home including reduction of carbon emissions.

705.1.2.6.1.8 General statement regarding opportunities to improve the thermal envelope, mechanical equipment, lighting and appliances in the home.

705.1.2.6.1.9 General discussion of observations and concerns regarding combustion safety.

705.1.2.6.1.10 A safety notification form adopted by the Residential Energy Services Network that is filled out and presented when obvious problems are observed in accordance with 704.1.2.5.1. It is recommended that a signed release be obtained from the homeowner indicating that they were made aware of the issues.

705.1.2.6.1.11. Information on relevant utility-based programs that will help the homeowner.

705.1.2.7 Limitations; Unless certified by RESNET as a Building Performance Auditor or Comprehensive HERS Rater, (or by another program recognized by RESNET), the Home Energy Survey Professional must not produce a detailed written work scope for improvements

as part of a Professional Home Energy Survey.

705.2 Building Performance Audit

The purpose of the Building Performance Audit is to cause improvement to be made to the audited home. The Building Performance Audit includes an evaluation, performance testing, computer software analysis and reporting of proposed treatments for improvement of an existing home. The evaluation must include a review of the data collected from any previous energy audit or survey, any further required measurement and performance testing, and combustion appliance testing. The Auditor must determine the appropriate scope of work for the home and must guide the homeowner to a RESNET Qualified Contractor to perform improvements. A homeowner may elect to go through this process with or without a prior Professional Home Energy Survey. A Building Performance Audit includes all of the provisions of the Professional Home Energy Survey (Section 705.1.2.5), plus the performance of diagnostic testing and reporting requirements as follows:

705.2.1. Evaluate building shell air leakage

At a minimum, a single point (50 Pa) blower door depressurization test must be performed in accordance with the envelope testing protocols contained in Appendix A of this Standard and the results thereof must be included in the audit report.

705.2.2. Evaluate duct leakage.

705.2.2.1 If more than 25% of the air-handler ducts are outside the conditioned space, it is recommended that the Auditor perform a duct pressurization test in accordance with the protocols in Appendix A of this Standard to quantify duct-leakage-to-outside, or specify a duct-leakage test prior to beginning any duct-sealing work.

705.2.2.2 If less than 25% of the air-handler ducts are outside the conditioned space, the auditor must perform pressure pan tests in accordance with Appendix A of this Standard to identify duct-sealing opportunities and include them in the report.

705.2.3 Determine any Zonal Pressure Differences

705.2.3.1 If the bedrooms do not have ducted returns, jumper ducts or some other method of equalizing the pressure between the room and the main body of the house when the bedroom door is closed, a Zonal Pressure Difference Test must be performed in accordance with the protocols in Appendix A of this Standard.

705.2.3.2 It is recommended that the Auditor determine the amount of pressurization or depressurization caused by closing rooms off from the area served by a central return, creating pressure zones within the home and measuring the pressure changes between the main body of the home and the outside and between the house and each room. The results of the Zonal Pressure Differences would justify recommendations in the work scope and must be included in the Audit report.

705.2.4. Determine Worst-Case Depressurization and Back-drafting Potential for Combustion Appliances

705.2.4.1 The Worst-Case Depressurization Test is only required when combustion appliances are in the conditioned space.

705.2.4.2 The auditor must determine if there is likelihood for all combustion appliances to have spillage within the building envelope when exhaust fans are operating by following the Worst-Case Depressurization protocol in the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.

705.2.4.3 The auditor must check the combustion appliance zone for the presence of flammable or explosive material near a combustion source.

705.2.4.4 The results of the combustion appliance spillage testing under Worst-Case Depressurization must be presented on the audit report

705.2.5 Perform Carbon Monoxide Testing

705.2.5.1. This test is only required when combustion appliances are within conditioned space.

705.2.5.2 Test the occupied zone of spaces containing combustion appliances for carbon monoxide following the protocol in the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.

705.2.5.3 Ambient CO monitoring must be performed continuously while performing a Worst Case Depressurization test.

705.2.5.4 The results of the CO testing must be presented on the audit report

705.2.6 Optional Thermal Imaging

While thermal imaging is a valuable diagnostic tool, particularly for performance evaluations of existing homes, it is not a required component of a Building Performance Audit.

705.2.7 Prepare a Detailed Retrofit Work Scope

A BPA Report must include a retrofit work scope in accordance with the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.

705.2.7.1 The scopes of work for recommended improvements will be determined by the Auditor and must be based upon the findings of the assessment and the client's budget.

However, at least the first 5 cost-effective items must be identified and recommended no matter what the budget of the client.

705.3 Minimum Building Performance Audit Report Documentation

705.3.1 Upon completion of the audit, provide the client with a written record (physical or electronic) of the audit and resulting recommendations within 3 working days. It must include:

705.3.1.1 General findings of audit as defined in Section 705.1.2.6

705.3.1.2 General recommendations for improvements

705.3.1.3 Scopes of work for suggested improvements

705.3.1.4 Software generated improvement analysis

705.4 Comprehensive HERS Rating

The Comprehensive HERS Rating is the most in-depth performance audit. It not only includes the evaluation, performance testing and reporting of the proposed work scope for improvement of an existing home, it involves a computerized simulation analysis utilizing RESNET Accredited Rating Software to calculate a rating score on the HERS Index. Since HERS Ratings of existing homes will be required to qualify loan applicants for certain mortgage products, the procedures for performing a Comprehensive HERS Rating are governed by Chapter 3 of the *National Energy Rating Technical Standards* and *Appendix A* of the latest version of the *RESNET Mortgage Industry National Home Energy Rating System Standards*. A homeowner is not required to have a Professional Home Energy Survey or Building Performance Audit prior to having a Comprehensive HERS Rating.

705.4.1 In addition to requirements set forth in Chapters 2-3 for certification as a HERS Rater, a *Comprehensive* HERS Rater must be certified by a HERS Provider to perform all required procedures defined in Appendix A and the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard including:

705.4.1.1 Pressure Diagnostics for the building envelope and air handler distribution ducts

705.4.1.2 Worst Case Depressurization and Combustion Appliance Testing.

705.4.1.1 Preparation of Retrofit Scope of Work

706 REQUIRED SKILLS FOR CERTIFICATION

706.1 Minimum skills and knowledge base required to conduct a Professional Home Energy

Survey

- 706.1.1 Basics of heat transfer concepts
- 706.1.2 Basics of building performance testing
- 706.1.3 Basics of air distribution leakage
- 706.1.4 Calculating gross and net areas
- 706.1.5 Definitions/energy terminology
- 706.1.6 Basic combustion appliance concerns
- 706.1.7 Basics of envelope leakage, thermal bypass, thermal bridging
- 706.1.8 Determining envelope insulation
 - 706.1.8.1 Presence/absence of insulation and when observable, the quality of its installation
 - 706.1.8.2 Recommended levels of insulation by climate zone
- 706.1.9 HVAC – determining equipment efficiencies from model numbers or default tables
- 706.1.10 Household appliances – determine efficiency from model numbers or vintage
- 706.1.11 Energy units
- 706.1.12 Measuring building dimensions
- 706.1.13 Identification and documentation of energy survey inspected features of the home
- 706.1.14 Basics of specifications
- 706.1.15 Determining window and door efficiency
- 706.1.16 Determining building orientation and shading characteristics
- 706.1.17 Defining the thermal boundaries
- 706.1.18 Basics of measure interaction, expected life, and bundling for optimal performance considering the house as a system and the emerging need for deep savings

706.2 Minimum skills and knowledge base required for an individual to conduct a Building Performance Audit

- 706.2.1 The skills and knowledge required for an individual to conduct a Home Energy Survey in accordance with section 705.1 of this standard.
- 706.2.2 Ability to perform building envelope leakage testing in accordance with the envelope testing protocols in Appendix A of this Standard.
- 706.2.3 Ability to perform duct leakage testing in accordance with the duct testing protocols contained in Appendix A of this Standard.
- 706.2.4 Ability to perform CAZ testing in accordance with Worst-Case Depressurization and Combustion Appliance Testing protocols contained in the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.
- 706.2.5 Ability to prepare a detailed scope of work in accordance with protocols contained in the RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.
- 706.2.6 Familiarity with local climate conditions and climate specific practices.

706.3 Minimum skills and knowledge base required for an individual to conduct a Comprehensive HERS Rating

- 706.3.1 The skills and knowledge required for an individual to conduct a Building Performance Audit in accordance with section 705.1 and 705.2 of this standard.
- 706.3.2 Familiarity with all HERS Rated features and data collection requirements as defined in Appendix A of the National Home Energy Rating Technical Guidelines
- 706.3.3 Ability to conduct building simulation and performance analysis and provide HERS Ratings in accordance with the requirements of the *Mortgage Industry National Home Energy Rating System Standards*.

707. GENERAL LIMITATIONS AND EXCLUSIONS

707.1 Limitations

707.1.1 The energy use information contained in reports resulting from Professional Home Energy Surveys, Building Performance Audits or Comprehensive HERS Ratings do not constitute any warranty of energy cost or savings.

707.1.2 Surveys, Audits and Ratings that are performed in accordance with these standards:

707.1.2.1 Are not technically exhaustive.

707.1.2.2 Will not identify concealed conditions or latent defects.

707.1.3 Neither the Building Performance Audit nor the Comprehensive HERS Rating is intended to be an inspection of the structural soundness of the home or any other attributes of the home other than the home's energy features.

707.1.4 The Professional Home Energy Survey is not applicable to building design and construction features except those listed in section 704.1.2.5.

708. HOME ENERGY AUDIT TRAINING PROVIDER ACCREDITATION

708.1 Requirements for Accredited HEA-Training Providers

708.1.1 Duties and Responsibilities. In order to maintain their accreditation in good standing for providing HESP and/or BPA training courses, all HEA-Training Providers must fully discharge the following duties and responsibilities.

708.1.1.1 Hold the national core competency questions of the national HESP and BPA test administered by RESNET in the strictest confidence.

708.1.1.2 Submit to RESNET for approval, copies of the HESP and BPA course presentation materials, training manuals, user manuals, course handouts and any other training materials used for training purposes,

708.1.1.3 Submit for approval, copies of all policies, standards, guidelines and procedures to be used by the HEA-Training Provider.

708.1.1.4 Maintain a record, for a period of three years, of all training materials and trainee data, including:

708.1.1.4.1 Historical records of all training schedules and curricula,

708.1.1.4.2 Historical records of all training attendance records,

708.1.1.4.3 Historical records of all examinations and individual examination results,

708.1.1.4.4 Historical records of all certifications issued to any individuals,

708.1.1.5 Maintain acceptable accounting practices, suitable to satisfy the requirements of independent audit procedures.

708.1.1.6 Maintain up-to-date training materials and provide adequate training facilities.

708.1.1.7 Only utilize RESNET Certified BPA Trainers who have at a minimum been certified by RESNET as having passed the 100-question BPA Trainer's Exam with a minimum score of 90%.

708.1.2 Privileges and rights. All accredited HEA-Training Providers in good standing must have certain privileges and rights, as follows:

708.1.2.1 The privilege to display the accreditation seal of the National Accreditation Body on any publications, displays, presentations or marketing materials published, authorized for publication or otherwise issued by the HEA-Training Provider.

708.1.2.2 The privilege to make and use RESNET designated trademarked, copyrighted or otherwise restricted materials for marketing both HESP and BPA Training Courses.

708.1.2.3 Copies of all current policies, standards, guidelines and procedures in use by the HEATraining Provider.

708.1.2.4 The right to present evidence, arguments and a vigorous defense in any action brought under these standards by any party against a HEA-Training Provider.

709 MINIMUM HOME ENERGY AUDIT TRAINER COMPETENCIES

709.1 Required HESP & BPA Trainer Competencies

709.1.1 To teach either HESP or BPA training curriculum, a HEA-Training Provider must maintain RESNET Certified BPA Trainer(s) demonstrating the following skills:

709.1.1.1 Mastery of the Home Energy Audit Standards knowledge base and skills set given in this chapter. The trainers must demonstrate these skills by passing the 100-question RESNET BPA Trainer's Exam with a minimum score of 90%.

709.1.1.2 Ability to communicate effectively the methods, procedures, knowledge and skills to produce accurate and fair Home Energy Audits from building investigation and performance testing and combustion safety in accordance with Chapter 7 and RESNET interim guidelines or the Texas HERO Home Energy Audit Standard.

709.1.1.3 Understanding of the purposes and benefits of home energy surveys and audits and ability to communicate these to students.

709.1.1.4 Understanding the basics of cost-effective energy improvements, preparing a scope of work and the ability to communicate these to students.

Justification

RESNET adopted the National Home Energy Audit Standards. After two years a number of changes were identified. Based upon the experience of the first year operations under the standards, the RESNET National Energy Audit Standard Task has proposed a total revision of the standard