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Energy Star New Homes Program
Attn: Mr. Sam Rashkin
U.S. Environmental Protection Agency
1200 Pennsylvania Ave., NW (6202J)
Washington, DC 20460

RE: Proposed ENERGY STAR Qualified New Homes 2011 Guidelines

After reviewing the proposed Energy Star Qualified New Homes 2011 guidelines, ACCA recommends that EPA revise its Energy Star checklists to align with the requirements of the preexisting heating, ventilating, and air conditioning (HVAC) Quality Installation (QI) program.

The current EPA Energy Star QI program for existing homes is based on the ANSI/ACCA 5 QI - 2007 (*HVAC Quality Installation Specification*). This industry-recognized standard was published after two years of development by HVAC Stakeholders (including the EPA). The ACCA 5 QI (QI Standard) establishes the minimum requirements, tolerances, procedures, and documentation that an HVAC system must meet.

Further, the current EPA Energy Star QI program verifies the HVAC installations meet the QI requirements using the ANSI/ACCA 9 QIVP – 2009 (*HVAC Quality Installation Verification Protocols*). This standard was developed by another group of HVAC industry stakeholders (including the EPA) to prescribe how HVAC systems are to be verified to ensure they meet the requirements provided in the QI Standard. The QI Verification Protocols (QIVP) Standard also discusses the roles and responsibilities of the Contractor, Verifier, and Administrator.

The existing QI Standard has been made available for free public download, and as mentioned, is in use by the EPA Energy Star QI program and by ACCA member contractors. Similarly, the existing QIVP Standard has been adopted by administrators of Energy Star QI programs providing objective 3rd party verification in California, Connecticut, Massachusetts, Texas, and other states.

The new home's HVAC checklists in the proposed guidelines will cause confusion with the existing Energy Star program. Both programs should use the same standard for the same goal, quality HVAC installations.

It was also observed that this program seemed to be specifically crafted for use by RESNET HERS raters. ACCA recommends using trained Verifiers who are skilled at providing the level of confirmation needed.

Specific recommended changes to the Energy Star Checklists are offered in Enclosures A and B.

In closing, ACCA commends the EPA for continuing to lead the energy efficiency community. It is anticipated that the EPA will continue to strike for harmony in their programs. ACCA stands ready to assist the EPA in the effort to improve occupant comfort, reduce waste, and save natural resources in new homes across America.

Wesley R. Davis
Manager, Technical Services
Air Conditioning Contractor's of America

Enclosure A: Energy Star HVAC Quality Installation Contractor Checklist
Enclosure B: Energy Star HVAC Quality Installation Rater Checklist

Contractor Checklist:

The following are specific recommendations to the Contractor Checklist used in the Energy Star HVAC Quality Installation portion of the program.

A1: Specific Recommendations to the Contractor Checklist		
Section	Current Requirement	Proposed Revisions (<u>new text is underlined</u> , deleted text is in strikethrough)
§2.1	Heat gain calculation method compliant with Manual J or equivalent, using the following assumptions	Revised text: Heat <u>loss and heat</u> gain calculation method compliant with Manual J or equivalent, using the following assumptions: Justification: Heat gain calculations address only the cooling load. ACCA recommends following the QI Standard requirement for heat loss and heat gain load calculations. The heat loss calculation can be used to evaluate the furnace, heat pump, or supplemental heat source.
§2.1.1.a)	Outdoor design temperature: a) 99.0% design as published in ASHRAE Handbook of Fundamentals	Revised text: a) 99.0% design as published in ASHRAE Handbook of Fundamentals <u>The outdoor design temperatures shall comply with the procedure being used</u> Justification: This requirement is confusing; Manual J does not list ASHRAE 99% design temperature requirements. Further, the ASHRAE 99% temperature is used for heat loss (not heat gain) calculations. It is recommended that the designer should use the values listed in the procedure being followed, i.e., Manual J or equivalent.
§2.1.1.b)	Outdoor design temperature: b) based on prevailing local practice reflecting documented weather data.	Revised text: b) based on prevailing local practice reflecting documented weather data <u>code or regulation that specifies another set of conditions.</u> Justification: Basing a design temperature on “prevailing local practice” could promote equipment over-sizing based on extreme conditions infrequently experienced.
§2.1.2	Indoor setpoint set at 75°F	Revised text: Indoor <u>design setpoints: set at heating 70°F, cooling 75°F</u> Justification: The default design temperatures required by Manual J (see §A5-3). Use of only one 75°F set point creates unnecessarily high heat loss calculations. It is recommended that additional language, like that used for alternative outdoor design temperatures, be added.
§2.5	In warm, humid counties in Climate Zones 1 - 3, equipment’s sensible heat ratio ≤ 0.70 or stand-alone ENERGY STAR qualified dehumidifier installed	Revised text: In warm, humid counties in Climate Zones 1 - 3, equipment’s sensible heat ratio ≤ 0.70 or stand-alone ENERGY STAR qualified dehumidifier installed <u>The sensible and latent capacity of the selected equipment will satisfy the building’s sensible and latent load. A supplemental ENERGY STAR qualified dehumidifier shall be installed if necessary.</u> Justification: During the equipment selection process the equipment SHR should be evaluated against the application’s needs. ACCA supports this added requirement of specifying a supplemental dehumidification if the equipment SHR is insufficient to meet the home’s latent load.
§4.	Equipment Capacity End note 6: Measured field value shall be within 5% of design value.	Revised text: Equipment Capacity (Remove the requirement for measuring equipment capacity.) Justification: These measurements (Latent, Sensible, and Total equipment capacity) have no industry approved standard method of test. When the equipment is properly selected based on the load calculations, then the equipment’s capacity will be acceptable when the airflow and refrigerant charge (or combustion rate) are within the acceptable tolerance.
§5.2	Duct static pressure – supply (WC)	Revised text: <u>Provide the values taken to demonstrate equipment airflow</u> Duct static pressure – supply (WC). Justification: The requirement is too restrictive. ACCA recommends that Energy Star allow other approved methods. The QI Standard §4.1, offers four approved procedures (static pressure is one of them) for determining equipment airflow.
§5.3	Duct static pressure – return (WC)	See the comment for §5.2.

A2: Comments on QI Standard Requirements Missing from the Proposed Energy Star Checklists	
Missing requirement	Justification for incorporating the additional requirement
Electrical	Comparing the measured electric value and comparing it to the nameplate value the manufacturer defines provides assurance that the components are consuming energy as intended.
Combustion	Verifying the combustion of fossil fuel appliances ensures it is consuming fuel as designed.
Venting	Auditing the venting of a fossil fuel appliance ensures harmful gasses are carried away from the occupants.
Controls	Reviewing the selection of the controls, and their proper sequence of operation, will ensure the equipment is performing as intended.
Airflow Balance	The rationale for this requirement is discussed below addressing §2.2.
Documentation	Requiring the compilation of files the owner will need for future service, repairs, or replacement will promote energy efficiency in the future.
Education	Owners, when applicable, should be taught how to use the equipment, what their warranty covers, and of whom to contact in the case of maintenance or a warranty claim. The home builder probably already provides this instruction for homes that have been built but have not been purchased.

A3: Comments on Energy Star Requirements Above the QI Standard		
Section	Requirement	Comment
§2.2	Duct design method compliant with Manual D or equivalent?	<p>Duct systems are designed and installed to carry air, ACCA recommends requiring a test and balance report to reveal how well the duct system performs this function.</p> <p>The requirement for compliance with Manual D can be subjective. The QI Standard addressed the goal of meeting the ACCA Manual D requirement by requiring:</p> <ol style="list-style-type: none"> 1. That airflow over the heat exchanger is proper, and 2. That duct leakage is low, 3. The measurement of the air delivered to the conditioned space, 4. Verification that the airflow was within the established tolerance of the design airflow. <p>In this way, a subjective design is not evaluated, but the performance of the design and installation of the duct system are evaluated.</p>
§2.4	Terminal design method compliant with Manual T or equivalent?	<p>ACCA recommends that this requirement be removed. This intent of the requirement is understood, but not required by the QI Standard. The variables affecting the “correct” or “approved” selection of a diffuser or grille were deemed too broad for inclusion into the QI Standard. This aspect of the HVAC system is discussed as an additional element in the QI Standard, Appendix 1.</p>

Rater Checklist:

The following are specific recommendations to the Contractor Checklist used in the Energy Star HVAC Quality Installation portion of the program.

B1: Specific Comments to the Rater Checklist		
Section	Current Requirement	Proposed Revisions (<u>new text is underlined</u> , deleted text is in strikethrough)
Title	ENERGY STAR Qualified Homes 2011 HVAC Quality Installation Rater Checklist	Revised text: ENERGY STAR Qualified Homes 2011 HVAC Quality Installation Rater <u>Verifier</u> Checklist Justification: The HVAC industry stakeholders involved with the creation of the QI Verification Protocols chose the word “Verifier” as the title of the person who evaluated HVAC systems for compliance to the QI Standard.
§2.1	Connections and routing of ductwork completed without kinks or bends > 90°	Revised text: Connections and routing of ductwork completed without kinks or bends > 90° No excess coiled or looped flexible ductwork No compression of flexible ductwork
§2.2	No excess coiled or looped flexible ductwork	Verify the Test and Balance report in accordance with the <u>ACCA 9 QIVP</u> . (Replace the requirements in §2.1, 2.2, and 2.3 with a requirement for a Test and Balance report.) Justification: The requirements in these sections seek to ensure the volume of air designed for the space is delivered there by the duct distribution system. Airflow to the conditioned space should be measured and compared with the design airflow, if the airflow is within tolerance (see the QI Standard) then the duct work meets its stated purpose, carrying air to its designated location.) A Test and Balance report records the necessary measurements to ensure the installed ducts deliver the design airflow (within tolerance). The revised requirement would extend coverage to other duct types such as: flexible, fiberglass duct board, sheet metal, etc.
§2.3	No compression of flexible ductwork	
§2.5	All connections to trunk ducts in unconditioned space insulated	Revised text: <u>All</u> ducts in unconditioned attics have insulation > R-8. All other ducts in unconditioned space have insulation > R-6. (Remove the requirement in §2.5.) Justification: The requirement in §2.5 would become redundant to the requirement in §2.7.
§2.7	Ducts in unconditioned attics have insulation > R-8; All other ducts in unconditioned space have insulation > R-6.	
§2.8	Total duct leakage ≤6 CFM per 100 sq. ft. of conditioned floor area	Revised text: <u>Meet the requirements set in the ANSI/ACCA 5 QI, §5.1.</u> Justification: The QI specification was developed by HVAC industry stakeholders and went through two public-review periods as part of the consensus process. The tolerances for duct leakage set there were developed with input from the EPA. The duct leakage to the outdoors requirement in §2.9 of the proposed checklist is mirrored in the QI Standard. The total duct leak requirement in §2.8 of the proposed checklist is considered to exceed or be equivalent to the tolerance level set.
§2.9	Duct leakage to outdoors ≤4 CFM per 100 sq. ft. of conditioned floor area	
§2.10	Bedroom pressure-balanced such that 1 sq. in. of opening is provided per 1 CFM of supply air. Dedicated return ducts, transfer grills, and/or jump ducts may be used to meet this requirement.	Revised text: Bedrooms: <u>provide a balanced return duct or pressure balanced return air path⁵</u> <u>End note # 5: Transfer grills, and/or jump ducts may be used to meet this requirement.</u> pressure-balanced such that 1 sq. in. of opening is provided per 1 CFM of supply air. Dedicated return ducts, transfer grills, and/or jump ducts may be used to meet this requirement. Justification: Dedicated return ducts, transfer grilles, transfer ducts, or door undercuts may require much less than 1 sq. in. of opening per 1 CFM, the desired result will be reflected in the test and balance report. Relocation of a proposed procedure to an end note is offered to simplify the requirement and improve comprehension.

B2: Comments on QI Standard Requirements Missing from the Proposed Energy Star Checklists	
Missing requirement	Justification for additional requirement
Electrical	Comparing the measured electric value and comparing it to the nameplate value the manufacturer defines provides an additional check that the components are consuming energy as intended.
Combustion	Verifying the combustion of fossil fuel appliances ensures it is consuming fuel as designed.
Venting	Auditing the venting of a fossil fuel appliance ensures harmful gasses are carried away from the occupants.
Controls	Reviewing the selection of the controls, and their proper sequence of operation, will ensure the equipment is performing as intended.
Airflow Balance	The rationale for this requirement is discussed below addressing §2.1, 2.2, and 2.3.
Documentation	Requiring the compilation of files the owner will need for future service, repairs, or replacement will promote energy efficiency in the future.
Education	Owners, when applicable, should be taught how to use the equipment, what their warranty covers, and of whom to contact in the case of maintenance or a warranty claim.