



ENERGY STAR Qualified Homes Inspection Checklists For National Program Requirements, Version 3.0

As described in the ENERGY STAR Qualified Homes National Program Requirements, Version 3.0, one prerequisite for qualification is that a home must meet the requirements of the four attached checklists:

- Thermal Enclosure System Rater Checklist
- HVAC System Quality Installation Contractor Checklist
- HVAC System Quality Installation Rater Checklist
- Water Management System Builder Checklist (or Indoor airPLUS Verification Checklist)¹

To be eligible for qualification, a home must also meet the other requirements listed in the national program requirements document, including verification of all requirements by a Rater.² Note that compliance with these guidelines is not intended to imply compliance with all local code requirements that may be applicable to the home to be built. Where requirements of the local codes, manufacturers' installation instructions, engineering documents, or regional ENERGY STAR programs overlap with the requirements of these guidelines, EPA offers the following guidance:

- a. In cases where the overlapping requirements exceed the ENERGY STAR guidelines, these overlapping requirements shall be met;
- b. In cases where overlapping requirements conflict with a requirement of these ENERGY STAR guidelines (e.g., slab insulation is prohibited to allow visual access for termite inspections), then the conflicting requirement within these guidelines shall not be met. Qualification shall only be allowed if the rater has determined that no equivalent option is available that could meet the intent of the conflicting requirement of these ENERGY STAR guidelines (e.g., switching from exterior to interior slab edge insulation).

Raters are expected to use their experience and discretion to verify that each checklist item is installed per the inspection guidelines (i.e., identifying major defects that undermine the intent of the checklist item versus identifying minor defects that the Rater may deem acceptable). Alternative methods of meeting the checklist requirements may be used if the Provider deems them to be equivalent to or more stringent than the checklist guidelines. However, in all cases, these "equivalent" determinations shall be reported prior to project completion to energystarhomes@energystar.gov. This will allow EPA to make formal policy decisions, as needed, to ensure consistent enforcement of the guidelines and to provide a resource for other partners with similar questions.

The Rater must review all items on the rater checklists. The column titled "N/A," which denotes items that are "not applicable," should be used when the checklist item is not present in the home or conflicts with local requirements.

In the event that a Rater finds an item that is inconsistent with the checklist guidelines, the home cannot earn the ENERGY STAR until the item is corrected. If correction of the item is not possible, the home cannot earn the ENERGY STAR. In the event that an item on a Rater checklist cannot be inspected by the Rater, the home also cannot earn the ENERGY STAR. The only exceptions to this rule are in the Thermal Enclosure System Rater Checklist, where the builder may assume responsibility for verifying a maximum of eight items. This option shall only be used at the discretion of the Rater. When exercised, the builder's responsibility will be formally acknowledged by the builder signing off on the checklist for the item(s) that they verified.

The Rater is required to keep hard copies of the completed and signed checklists. The signature of the HVAC technician is required if any of the HVAC equipment specified on the HVAC System Quality Installation Contractor Checklist is installed in the home.

All checklists, including the HVAC System Quality Installation Contractor Checklist and Water Management System Builder Checklist may be completed for a batch of homes using a RESNET-approved sampling protocol to qualify homes as ENERGY STAR. For example, if the approved sampling protocol requires rating one in seven homes, then all of the checklists must be completed for the one required rating.

Rater Name: _____
Rater Company Name: _____
Builder Company Name: _____
HVAC Company Name: _____



ENERGY STAR Qualified Homes Inspection Checklist Notes



1. A completed and signed Indoor airPLUS Verification Checklist may be submitted in lieu of the Water Management System Builder checklist. Indoor airPLUS is a complimentary EPA label recognizing new homes equipped with a comprehensive set of Indoor Air Quality (IAQ) features. Indoor airPLUS verification can be completed by a Rater during the ENERGY STAR verification process. For more information, see www.epa.gov/indoorairplus
2. The term "Rater" refers to the person completing the third-party inspections required for qualification. This party may be a certified Home Energy Rater, BOP Inspector, or an equivalent designation as determined by a Verification Oversight Organization such as RESNET.



ENERGY STAR Qualified Homes Thermal Enclosure System Rater Checklist

Home Address: _____ City: _____ State: _____				
Inspection Guidelines	Must Correct	Builder Approved ¹	Rater Approved	N/A
1. High-Performance Windows				
1.1 <i>Prescriptive Path</i> : Windows shall meet or exceed ENERGY STAR window requirements ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 <i>Performance Path</i> : Windows shall meet or exceed 2009 IECC requirements ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Quality-Installed Insulation				
2.1 Ceiling, floor, and wall insulation levels shall meet or exceed 2009 IECC levels ⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2 For Climate Zones 4 and higher, slab insulation shall meet or exceed 2009 IECC levels ⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3 Insulation shall achieve RESNET-defined Grade I installation or, alternatively, Grade II for walls with insulated sheathing, (see checklist item 4.3.1 for required insulation levels)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Fully-Aligned Air Barriers⁵				
At each location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows:				
<ul style="list-style-type: none"> • At interior surface of ceilings in all Climate Zones • At exterior surface of walls in all Climate Zones; and also at interior surface of walls for Climate Zones 4-8⁶ • At interior surface of floors in all Climate Zones, including supports to ensure permanent contact and blocking at exposed edges⁷ 				
3.1 Walls				
3.1.1 Walls behind showers and tubs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.2 Walls behind fireplaces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.3 Attic knee walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.4 Skylight shaft walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.5 Wall adjoining porch roof	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.6 Staircase walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.7 Double walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.8 Garage rim / band joist adjoining conditioned space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.9 All other exterior walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Floors				
3.2.1 Floor above garage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.2 Cantilevered floor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.3 Floor above unconditioned basement or vented crawlspace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 Ceilings				
3.3.1 Dropped ceiling/soffit below unconditioned attic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3.2 At all insulated ceilings, including wind baffles installed at eaves in every bay, or equivalent air barrier, at edge of ceiling insulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3.3 Insulated attic slopes/walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Reduced Thermal Bridging				
4.1 Raised-heel truss or equivalent framing method used in the attic ⁸	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2 HVAC and other attic platforms installed to allow for full-depth insulation below	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3 Reduced thermal bridging at walls with one of the following options:				
4.3.1 Continuous rigid insulation sheathing, insulated siding, or combination of the two; \geq R-3 in Climate Zones 1-4, \geq R-5 in Climate Zones 5-8 ^{9,10} , OR ;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3.2 Structural Insulated Panels (SIPs), OR ;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3.3 Insulated Concrete Forms (ICFs), OR ;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3.4 Double-wall framing ¹¹ , OR ;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3.5 Advanced framing, including all of the items below:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3.5a All corners insulated \geq R-6 to edge ¹² , AND ;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3.5b All headers above windows & doors insulated ¹³ , AND ;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3.5c Framing limited at all windows & doors ¹⁴ , AND ;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3.5d All interior / exterior wall intersections insulated ¹⁵ , AND ;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3.5e Minimum stud spacing of 16" for 2 x 4 framing and 24" for 2 x 6 framing unless construction documents specify other spacing is structurally required ¹⁶	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



ENERGY STAR Qualified Homes Thermal Enclosure System Rater Checklist

Inspection Guidelines	Must Correct	Builder Approved ¹	Rater Approved	N/A
5. Air Sealing				
5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam				
5.1.1 Duct / flue shaft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1.2 Plumbing / piping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1.3 Electrical wiring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1.4 Bathroom and kitchen exhaust fans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1.5 Recessed lighting fixtures ICAT labeled and fully gasketed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2 Cracks in the building envelope fully sealed				
5.2.1 Foam gasket placed beneath sill plate and foundation; sill plate sealed to foundation with caulk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2.2 For walls, continuous top plates or sealed blocking using silicone caulk, latex foam, or equivalent material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2.3 Sheetrock sealed to top plate at all attic/wall interfaces using silicone caulk, latex foam, or equivalent material. Construction adhesive shall not be used.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2.4 Rough opening around windows & exterior doors sealed with caulk or foam	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2.5 Marriage joints between modular home modules at all exterior boundary conditions fully sealed with gasket and foam	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2.6 All seams at Structural Insulated Panels (SIPs) foamed and taped	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2.7 In multi-family buildings, the gap between the drywall shaft wall (i.e. common wall) and the structural framing between units fully sealed at all exterior boundary conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3 Other Openings				
5.3.1 Exterior doors gasketed or made substantially air-tight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3.2 Attic access panels and drop-down stairs equipped with $\geq R-10$ insulated cover and gasketed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3.3 Whole-house fans equipped with $\geq R-10$ insulated cover that is either installed on the house side or mechanically operated, and gasketed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____ Rater Pre-Drywall Inspection Date: _____ Rater Initials: _____				
Rater Name: _____ Rater Final Inspection Date: _____ Rater Initials: _____				
Builder Employee: _____ Builder Inspection Date: _____ Builder Initials: _____				

Notes:

- At the discretion of the Rater, the builder may verify up to eight items specified in this checklist. When exercised, the builder's responsibility will be formally acknowledged by the builder signing off on the checklist for the item(s) that they verified.
- For Prescriptive Path:* All windows, doors, and skylights shall meet ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows except fenestration utilized as part of a passive solar design. These windows shall be facing within 15 degrees of true south and directly coupled to thermal storage mass that has a heat capacity > 20 btu/ft³x°F and provided in a ratio of at least 3 sq. ft per sq. ft. of south facing fenestration. Generally, thermal mass materials will be at least 2" thick. Also, note that the U-value and SHGC for doors apply to the whole door, not just to the glazing portion.
- For Performance Path:* All windows, doors and skylights shall meet or exceed IECC 2009 U-factor and SHGC requirements specified in the 2009 IECC – table 402.1.1.
- Insulation levels in a home shall meet or exceed those specified in the 2009 IECC. Compliance can be determined by meeting component insulation requirements in Table 402.1.1, using U-factor alternatives in Table 402.1.3, or using a total UA alternative, as described in Section 402.1.4 of the 2009 IECC. Note that the U-factor for steel-frame envelope assemblies shall be calculated using the ASHRAE zone method or a method providing equivalent results, and not a series-parallel path calculation method. Additionally, reduction of ceiling insulation in space-constrained roof/ceiling assemblies shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. Finally, slab insulation shall extend to the top of the slab to provide a complete thermal break.
- For purposes of this checklist, an air barrier is defined as any durable solid material that blocks air flow between conditioned space and unconditioned space, including necessary sealing to block excessive air flow at edges and seams. EPA recommends, but does not require, rigid air barriers. If flexible air barriers are used, they shall be fully taped and sealed as required for a complete air barrier assembly and shall not be made of materials that are easily torn, including paper-based products such as kraft paper. Additional information on proper air sealing of thermal bypasses can be found on the Building



ENERGY STAR Qualified Homes

Thermal Enclosure System Rater Checklist

America Web site (www.eere.energy.gov/buildings/building_america) and in the EEBA Builder's Guides (www.eeba.org). These references include guidance on identifying and sealing air barriers as well as details on many of the items included in the checklist.

6. Band joists are currently exempt from interior air barrier requirement in Climate Zones 4 thru 8, but highly encouraged by EPA as a best practice.
7. Examples of supports necessary for permanent contact include staves for batt insulation or netting for blown-in insulation.
8. Raised-heel trusses or equivalent framing techniques shall elevate the roof adequately to allow for insulation at a depth at the inside face of the stud wall below of at least 75% of full insulation level used throughout the rest of the attic.
9. If used, insulated siding shall provide the required R-value at its minimum thickness and be attached directly over a water-resistive barrier and sheathing. If non-insulated structural sheathing is used at corners, advanced framing details listed under requirement 4.3.5 shall be met for those wall sections.
10. Steel framing shall meet the reduced thermal bridging requirements by complying with item 4.3.1 of the checklist.
11. Double-wall framing is defined as any framing method that ensures a continuous layer of insulation covering the studs to at least the R-value required in Section 4.3.1 of the checklist, such as offset double-stud walls, aligned double-stud walls with continuous insulation between the adjacent stud faces, or single-stud walls with 2x2 or 2x3 cross-framing. In all cases, insulation shall fill the entire wall cavity from the interior to exterior sheathing except at windows, doors and other penetrations.
12. All exterior corners shall have insulation extend to exterior wall sheathing using either "California Corners" or equivalent alternative framing technique that uses no more than three studs per corner and allows access to insulate the cavity to \geq R-6.
13. Headers shall be minimum R-3 for Climate Zones 1 through 4 and R-5 for Climate Zones 5-8 using continuous rigid insulation sheathing, SIP headers, other prefabricated insulated headers, two-member headers with insulation between, single-member headers insulated on one side, or an equivalent assembly, except where structural engineered framing layout indicates that full-depth solid headers are the only acceptable option. R-value requirement refers to manufacturer's nominal insulation value.
14. Framing at windows shall be limited to a maximum of one pair of king studs and one pair jack studs per window opening to support the header and window sill. Additional jack studs shall be used only as needed for structural support and cripple studs only as needed to maintain on-center spacing of studs.
15. Insulation shall run continuously behind interior/exterior wall intersections using ladder blocking, full length 2"x6" or 1"x6" furring behind the first partition stud, drywall clips, or other equivalent alternative.
16. Vertical framing members shall either be on-center or have an alternative structural purpose that is apparent to the rater or documented by the builder, architect or engineer. No more than 5% of studs may lack an apparent or documented structural purpose, which is equivalent to one vertical stud for every 30 linear feet of wall, assuming 16" stud spacing.



ENERGY STAR Qualified Homes Inspection Checklists

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ENERGY STAR Qualified Homes HVAC System Quality Installation Contractor Checklist¹

Home Address: _____ City: _____ State: _____

1. Whole-Building Mechanical Ventilation Design²

- 1.1 Ventilation system designed to meet ASHRAE 62.2-2007 requirements³ Contractor Approved
- 1.2 Ventilation system does not utilize an intake duct to the return side of the HVAC system unless coupled with a motorized damper and control system Contractor Approved
- 1.3 Documentation is attached with ventilation system type, location and design rate Contractor Approved
- 1.4 If present, continuously-operating ventilation and exhaust fans designed to operate during all occupiable hours Contractor Approved N/A
- 1.5 If present, intermittently-operating whole-house ventilation system designed to automatically operate at least once per day and at least 10% of every 24 hours Contractor Approved N/A

2. Heating & Cooling System Design^{2,4} - The following design parameters shall be used in the design calculations:

- A. Outdoor design temps. comply with procedure being used⁵
- B. Indoor temp. setpoints = 70°F for heating; 75°F for cooling
- C. Infiltration rate = "Tight", or equivalent rate
- D. Insulation levels and window U-Values/SHGC's match rated home
- E. Airflow accounts for MERV 6 air filter
- F. ASHRAE 62.2 ventilation load accounted for

- 2.1 Heat Loss / Gain Method: Manual J v8 ASHRAE 2005 Other: _____
- 2.2 Duct Design Method: Manual D Other: _____
- 2.3 Equipment Selection Method: Manual S OEM Recommended Other: _____
- 2.4 Outdoor Design Temperatures Used: 1%: _____ °F 99%: _____ °F
- 2.5 Design Latent Heat Gain: _____ BTUh
- 2.6 Design Sensible Heat Gain: _____ BTUh
- 2.7 Design Total Heat Gain: _____ BTUh
- 2.8 Design Sensible Heat Ratio (SHR): _____ (Value 2.6 ÷ Value 2.7)
- 2.9 Design Total Heat Loss: _____ BTUh
- 2.10 Design Airflow: _____ CFM
- 2.11 Design Duct Static Pressure: _____ IWC
- 2.12 Copy of load calculations attached? Contractor Approved

3. Selected Cooling Equipment, If Cooling Equipment to be Installed

- 3.1 Condensor Manufacturer & Model: _____
- 3.2 Condensor Serial #: _____
- 3.3 Evaporator Manufacturer & Model: _____
- 3.4 Evaporator Serial #: _____
- 3.5 AHRI Reference #:⁶ _____ N/A
- 3.6 Listed Efficiency: _____ EER _____ SEER
- 3.7 Metering Device Type: TXV Fixed orifice Other: _____
- 3.8 Refrigerant Type: R-22 R-410a Other: _____
- 3.9 Fan Speed Type:⁷ Fixed Variable (ECM/ICM) Other: _____
- 3.10 Selected Latent Capacity at Design Cond.: _____ BTUh
- 3.11 Selected Sensible Capacity at Design Cond.: _____ BTUh
- 3.12 Selected Total Capacity at Design Cond.: _____ BTUh
- 3.13 Selected Sensible Heat Ratio (SHR): _____ (Value 3.11 ÷ Value 3.12)
- 3.14 Selected SHR (Value 3.13) ≤ Design SHR (Value 2.8) Contractor Approved No
- 3.15 If No, ENERGY STAR qualified dehumidifier installed? Contractor Approved N/A
- 3.16 Capacity (Value 3.12) is 95-115% of Design Heat Gain (Value 2.7) or next nom. size Contractor Approved N/A
Or for Heat Pumps in Climate Zones 4-8, 95-125% or next nominal size Contractor Approved N/A
- 3.17 AHRI Certificate Attached?⁶ Contractor Approved

4. Selected Heat Pump Equipment, If Heatpump to be Installed

- 4.1 AHRI Listed Efficiency: _____ HSPF
- 4.2 Performance at 17°F: Capacity: _____ BTUh Efficiency: _____ COP
- 4.3 Performance at 47°F: Capacity: _____ BTUh Efficiency: _____ COP

5. Selected Furnace, If Furnace to be Installed

- 5.1 Furnace Manufacturer & Model: _____
- 5.2 Furnace Serial #: _____
- 5.3 Listed Efficiency: _____ AFUE
- 5.4 Selected Gross Capacity: _____ BTUh
- 5.5 Gross capacity (Value 5.4) is 100-140% of design heat loss (Value 2.9) or next nom. size Contractor Approved



ENERGY STAR Qualified Homes HVAC System Quality Installation Contractor Checklist¹

6. Refrigerant Tests - Run system for 15 minutes before testing

Note: If cold weather makes it impossible to verify proper refrigerant charge, system must include a TXV⁸

- 6.1 Outdoor ambient temp. at condensor: _____ °F DB
- 6.2 Return-side air temperature measured inside duct near evaporator:
Cooling Mode _____ °F WB
- 6.3 Liquid line pressure: _____ psig
- 6.4 Liquid line temperature: _____ °F DB
- 6.5 Suction line pressure: _____ psig
- 6.6 Suction line temperature: _____ °F DB

7. Refrigerant Calculations

- 7.1 Condensor saturation temp.: _____ °F DB (Using Value 6.3)
- 7.2 Evaporator saturation temp.: _____ °F DB (Using Value 6.5)
- 7.3 Subcooling: _____ °F DB (Value 7.1 - Value 6.4)
- 7.4 Superheat: _____ °F DB (Value 7.2 - Value 6.6)

For TXV

- 7.5 OEM subcooling goal: _____ °F DB
- 7.6 Subcooling deviation: _____ °F DB (Value 7.3 - Value 7.5)

For Fixed Orifice

- 7.7 Superheat goal: _____ °F DB (From superheat lookup tables, based on Values 6.1 and 6.2)
- 7.8 Superheat deviation: _____ °F DB (Value 7.4 - Value 7.7)

7.9 Value 7.6 is $\pm 3^{\circ}\text{F}$ or Value 7.8 is $\pm 5^{\circ}\text{F}$? Contractor Approved

8. Electrical Measurements

- 8.1 Evaporator/air handler fan: _____ amps _____ volts _____ watts
- 8.2 Condensor fan: _____ amps _____ volts _____ watts
- 8.3 Compressor: _____ amps _____ volts _____ watts

8.4 Electrical measurements within OEM specified tolerance of nameplate value? Contractor Approved

9. Air Flow Tests

- 9.1 Air volume at evaporator: _____ CFM
- 9.2 Test performed in which mode? Heating Cooling
- 9.3 Return static pressure: _____ IWC Location: _____
- 9.4 Supply static pressure: _____ IWC Location: _____
- 9.5 Measurement method used: Flow grid Pressure matching⁹ Anemometer
 Fan curve Temperature rise (heating only) Other:

9.6 Airflow volume at evaporator (Value 9.1), at fan design speed and full operating load, +/- 15% of the airflow required per system design (Value 2.10) or within range recommended by OEM? Contractor Approved

10. Air Balance

10.1 Individual room airflows within the greater of $\pm 20\%$ or 25 CFM of the design/application requirements for the supply and return ducts? Contractor Approved

11. System Controls

11.1 Operating and safety controls meet OEM requirements Contractor Approved

12. Drain pan

12.1 Corrosion-resistant drain pan, properly sloped to drainage system, included¹⁰ Contractor Approved

Technician Name: _____ Equipment Installation Date: _____
Technician Signature: _____ Company: _____

If the HVAC system design (Sections 1 & 2) was not completed by the HVAC technician, then Designer shall sign below:

Designer Name: _____ System Design Date: _____
Designer Signature: _____ Company: _____



ENERGY STAR Qualified Homes HVAC System Quality Installation Contractor Notes

1. The HVAC System Quality Installation Contractor Checklist is designed to align with the requirements of ASHRAE 62.2-2007 and published addenda and ANSI / ACCA's 5 QI-2007 protocol, thereby improving the performance of HVAC equipment in new homes when compared to homes built to minimum code. However, these features alone cannot prevent all ventilation, indoor air quality, or HVAC problems; for instance those caused by a lack of maintenance by the occupants. Therefore, this checklist is not a guarantee of proper ventilation, indoor air quality, or HVAC performance.

This checklist applies to ventilation systems, split air conditioners, unitary air conditioners, air-source/water-source heat pumps up to 65,000 Btu/h and furnaces up to 225,000 Btu/h. All other equipment is exempt.

This checklist shall be provided by the Rater to the HVAC contractor who shall complete one checklist for each system. Upon completion, the HVAC contractor shall return the checklist(s) to the Rater.

This checklist with supporting documents may also be used to demonstrate compliance with Indoor airPLUS specifications 4.1, 4.2, 4.5, 4.6, and 7.1.

2. The person responsible for the heating, cooling, and ventilation design, whether it be the HVAC technician or other qualified HVAC design professional, shall be responsible for completing sections 1 and 2 of this checklist.
3. For proper procedures, exceptions, and selection methods see ASHRAE 62.2-2007 and published addenda. All components shall be designed and installed per local codes, manufacturers' installation instructions, engineering documents, and regional ENERGY STAR program requirements.

The system shall have at least one supply or exhaust fan with associated ducts and controls. Local exhaust fans are allowed to be part of an exhaust ventilation system. Outdoor air ducts connected to the return side of an air handler are allowed to be part of a supply ventilation system if manufacturers' requirements for return air temperature are met.

4. Heating and cooling loads shall be calculated, equipment capacity shall be selected, and duct systems shall be sized according to the latest editions of ACCA Manuals J, S, & D, respectively, ASHRAE 2005 Handbook of Fundamentals, or a substantively equivalent procedure.
5. If prevailing local practice uses alternative design temperatures due to the presence of microclimate conditions, those temperatures may be used if the corresponding weather data documentation is attached.
6. All evaporators and condensing units and furnaces shall be properly matched as demonstrated by an attached AHRI certificate. If an AHRI certificate is not available, a copy of OEM-provided catalog data indicating acceptable combination selection and performance data shall be attached.
7. Fan speed type shall be variable (ECM/ICM) if whole-house ventilation system utilizes the HVAC air handler fan.
8. Either factory-installed or field-installed TXV may be used. For field-installed TXV's, ensure that sensing bulbs are insulated and tightly clamped to the vapor line with good linear thermal contact at the recommended orientation, usually 4 or 8 o'clock.
9. The pressure matching method uses a calibrated fan to match the supply plenum pressure produced when the HVAC air handler fan is in operation. The airflow through the calibrated fan that produces the same pressure is assumed to match the HVAC air handler fan airflow.
10. Corrosion-resistant materials include stainless steel and plastic. Drain pan shall be sloped enough so it does not retain standing condensate; shall drain condensate to a drainage system, rather than just depositing underneath the foundation; shall not be drained to the plumbing waste system; and, when drained to a shared drainage system such as a storm water management system, shall be equipped with backflow prevention valve.



ENERGY STAR Qualified Homes Inspection Checklists

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ENERGY STAR Qualified Homes HVAC System Quality Installation Rater Checklist¹

Home Address: _____ City: _____ State: _____			
Inspection Guidelines	Must Correct	Rater Approved	N/A
1. Review of HVAC System Quality Installation Contractor Checklist			
1.1. HVAC System Quality Installation Contractor checklist completed in its entirety. ²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Duct Quality Installation <i>Applies to All Heating, Cooling, Ventilation, Exhaust, and Pressure Balancing Ducts</i>			
2.1 Connections and routing of ductwork completed without kinks or sharp bends. ³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2 No excessive coiled or looped flexible ductwork. ⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3 Flexible ducts in unconditioned space not be installed in cavities smaller than outer duct diameter; in conditioned space not installed in cavities smaller than inner duct diameter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4 Flexible ducts supported at intervals as recommended by manufacturer but at a distance ≤ 5 ft.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5 Building cavities shall not be used as supply or return ducts unless they meet items 3.2, 3.3, 4.1, and 4.2 of this checklist.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6 HVAC ducts, cavities used as ducts, and combustion inlets and outlets may pass perpendicularly through exterior walls but shall not be run within exterior walls unless at least R-6 continuous insulation is provided on exterior side of the cavity, along with an interior and exterior air barrier where required by the Thermal Enclosure Checklist.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7 Bedrooms pressure-balanced by a) providing 1 sq. in. of free area opening per 1 CFM of measured supply air using transfer grills and/or jump ducts; b) using dedicated return ducts; or c) achieving a measured pressure differential ≤ 3 Pa (0.012 in. w.c.) with respect to the outside when bedroom doors are closed and the air handler is operating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Duct Insulation <i>Applies to All Heating, Cooling, Supply Ventilation, and Pressure Balancing Ducts</i>			
3.1 All connections to trunk ducts in unconditioned space insulated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 <i>Prescriptive Path:</i> Supply ducts in unconditioned attic have insulation \geq R-8. <i>Performance Path:</i> Supply ducts in unconditioned attic have insulation \geq R-6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 All other supply ducts and all return ducts in unconditioned space have insulation \geq R-6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Duct Leakage <i>Applies to All Heating, Cooling, and Balanced Ventilation Ducts</i>			
4.1 Total measured duct leakage ≤ 6 CFM25 per 100 sq. ft. of conditioned floor area. ⁵	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Measured duct leakage to outdoors ≤ 4 CFM25 per 100 sq. ft. of conditioned floor area. ^{5, 6}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3 Duct boots sealed to floor, wall, or ceiling using caulk, foam, mastic tape, or mastic paste.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Whole-Building Delivered Ventilation			
5.1 Measured ventilation rate is within 100-120% of HVAC contractor design values. ⁷	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2 In Warm-Humid climates, measured net exhaust flow < 7.5 CFM per 100 sq. ft. ^{7, 8, 9}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3 In very cold climates (i.e., CZ 7-8), measured net supply flow < 7.5 CFM per 100 sq. ft. ^{7, 9}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Ventilation Controls			
6.1 Continuously-operating ventilation and exhaust fans include readily accessible override controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2 Controls labeled, unless function is obvious (e.g., bathroom exhaust fan).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Air Inlets & Ventilation Source			
7.1 Air inlets located ≥ 10 ft. from contamination sources such as stack, vent, exhaust hood, or locations where vehicle exhaust may be present and ≥ 3 ft. from dryer exhausts and contamination sources exiting through the roof	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2 Air inlets ≥ 2 ft. above grade or roof deck in Climate Zones 1-3 or ≥ 4 ft. above grade or roof deck in Climate Zones 4-8 and not obstructed by snow, plantings, or other material at time of inspection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3 Air inlets provided with mesh rodent / insect screen with mesh ≤ 0.5 in.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4 Ventilation air comes directly from outdoors and not from adjacent dwelling units, garages, unconditioned crawlspaces, or attics.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



ENERGY STAR Qualified Homes HVAC System Quality Installation Rater Checklist¹

Inspection Guidelines			Must Correct	Rater Approved	N/A
8. Local Mechanical Exhaust					
In each kitchen and bathroom, system installed that exhausts directly to the outdoors and meets one of the following measured airflow standards: ^{7, 10, 13}					
Location	Continuous Rate	Intermittent Rate¹¹			
8.1 Kitchen	> 5 ACH, based on kitchen volume	> 100 CFM ¹²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2 Bathroom	> 20 CFM	> 50 CFM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3 If fans share common exhaust duct, back-draft dampers installed.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4 Common exhaust duct not shared by fans in separate dwellings. ¹⁴			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.5 Clothes dryers, except electric condensing dryers equipped with condensate drain, vented directly to outdoors.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Ventilation & Exhaust Fan Ratings (Exemptions for HVAC and Remote-Mounted Fans)¹⁵					
9.1 Intermittent supply & exhaust fans rated at ≤ 3 sones by manufacturer, unless rated flow ≥ 400 CFM.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2 Continuous supply & exhaust fans rated at ≤ 1 sone by manufacturer.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3 Bathroom fans used as part of a whole-house mechanical ventilation system shall be ENERGY STAR qualified; unless rated flow rate ≥ 500 CFM.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Combustion Appliances					
10.1 Furnaces, boilers, and water heaters located within the home's pressure boundary are mechanically drafted or direct-vented to outdoors. As an exception, atmospherically vented equipment is allowed in Climate Zone 1-3. For atmospherically vented furnaces, boilers, and water heaters, the Rater has conducted BPI's combustion safety test procedure and determined that the CO test results are less than 25 ppm and the combustion appliance zone depressurization limit is not exceeded. ^{16,17,18}			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2 If atmospherically vented fireplaces are located inside the home's pressure boundary, total net rated exhaust flow of the two largest exhaust fans (excluding summer cooling fans) is ≤ 15 CFM per 100 sq. ft. of occupiable space when at full capacity. ^{9, 17, 19}			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Filtration					
11.1 MERV 6 or better filter installed in ducted mechanical systems. ²⁰			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.2 All return air and mechanically supplied outdoor air pass through filter prior to conditioning.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.3 Filter located and installed so as to facilitate access and regular service by the owner.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.4 Filter access panel includes gasket or comparable sealing mechanism and fits snugly against the exposed edge of filter when closed to prevent bypass.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____ Date Checklist Inspected: _____					
Rater Signature: _____ Rater Company Name: _____					



ENERGY STAR Qualified Homes HVAC System Quality Installation Rater Notes

1. The HVAC System Quality Installation Rater Checklist is designed to align with the requirements of ASHRAE 62.2-2007 and published addenda and ANSI / ACCA's 5 QI-2007 protocol, thereby improving the performance of HVAC equipment in new homes when compared to homes built to minimum code. However, these features alone cannot prevent all ventilation, indoor air quality, and HVAC problems, for instance those caused by a lack of occupant maintenance. Therefore, this checklist is not a guarantee of proper ventilation, indoor air quality, or HVAC performance. This checklist with supporting documents may also be used to demonstrate compliance with Indoor airPLUS specifications 4.1, 4.2, 4.5, 4.6, and 7.1.
2. The Rater is only responsible for ensuring that the Contractor has completed the Contractor checklist in its entirety, not for assessing the accuracy of the load calculations or field verifications included. It is the contractor's exclusive responsibility to ensure the system design and installation comply with the Contractor checklist specifications.
3. Kinks are to be avoided and are caused when ducts are bent across sharp corners such as framing members. Sharp bends are to be avoided and occur when the radius of the duct centerline is less than one duct diameter.
4. Ducts shall not include coiled or looped ductwork except to the extent needed for acoustical control. Balancing dampers shall be used instead of loops to limit flow to diffusers.
5. Duct leakage shall be determined and documented by a Rater using a RESNET-approved testing protocol. Duct leakage testing can be waived if all ducts & air handling equipment are located within the home's air and thermal barriers AND envelope leakage has been tested to be less than or equal to *half* of the prescriptive path infiltration limit for the Climate Zone where the home is to be built. For all homes that have less than 1,200 sq ft of conditioned floor area (CFA), total measured duct leakage shall be ≤ 8 CFM25 per 100 sq. ft. of CFA and measured duct leakage to outdoors shall be ≤ 5 CFM25 per 100 sq. ft. of CFA.
6. If total duct leakage is ≤ 4 CFM25 per 100 sq. ft. of conditioned floor area, or ≤ 5 CFM25 per 100 sq. ft. of conditioned floor area for homes that have less than 1,200 sq. ft. of conditioned floor area, then leakage to outdoors need not be tested.
7. The whole-house ventilation air flow and local exhaust air flows shall be measured by the Rater using a flow hood, flow grid, anemometer (in accordance with AABC, NEBB or ASHRAE procedures), or substantially equivalent method.
8. Warm-Humid climates are defined by section 301.2 of the 2009 IECC and include Climate Zones 1, 2 and parts of 3. All other climates are exempt from this requirement.
9. The term "net-exhaust flow" is referenced from ASHRAE 62.2-2007 and published addenda and is defined as the flow through an exhaust system minus the compensating outdoor airflow through any supply system that is interlocked to the exhaust system. If net exhaust flow exceeds allowable limit, net exhaust flow shall be reduced or compensating outdoor airflow provided. The term "net supply flow" is intended to represent the inverse.
10. Per ASHRAE 62.2-2007, an exhaust system is 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.
11. An intermittent mechanical exhaust system, where provided, shall be designed to operate as needed by the occupant. Control devices shall not impede occupant control in intermittent systems.
12. If intermittent fan flow rate of at least 100 CFM is less than 5 ACH, based on kitchen volume, then a vented range hood is required.
13. Per ASHRAE 62.2-2007, a bathroom is any room containing a bathtub, shower, spa, or similar source of moisture.
14. Exhaust outlets from more than one dwelling unit may be served by a single exhaust fan if the fan runs continuously or if each outlet has a back-draft damper to prevent cross-contamination when the fan is not running.
15. Fans exempted from this requirement include HVAC air handlers and remote-mounted fans (i.e., fans outside habitable spaces, bathrooms, toilets, and hallways and with ≥ 4 ft. ductwork between fan and intake grills). Per ASHRAE 62.2-2007, habitable spaces are intended for continual human occupancy; such space generally includes areas used for living, sleeping, dining, and cooking but does not generally include bathrooms, toilets, hallways, storage areas, closets, or utility rooms.
16. Per the 2009 International Mechanical Code, a direct-vent appliance is one that is constructed and installed so that all air for combustion is derived from the outdoor atmosphere and all flue gases are discharged to the outside atmosphere. Furthermore, a mechanical draft system is a venting system designed to remove flue or vent gases by mechanical means consisting of an induced draft portion under non-positive static pressure or a forced draft portion under positive static pressure. All atmospherically vented combustion appliances other than fireplaces shall comply with the Building Performance Institute's (BPI's) Combustion Safety Test Procedure for Vented Appliances.
17. The pressure boundary is the primary air enclosure boundary separating indoor and outdoor air. For example, a volume that has more leakage to outside than to conditioned space would be outside the pressure boundary.
18. In alignment with ASHRAE 62.2-2007, these ENERGY STAR guidelines do not address unvented combustion space heaters.
19. Per ASHRAE 62.2-2007, occupiable space is any enclosed space inside the pressure boundary and intended for human activities, including, but not limited to, all habitable spaces, toilets, closets, halls, storage and utility areas, and laundry areas. See footnote 15 for definition of "habitable spaces".



ENERGY STAR Qualified Homes

HVAC System Quality Installation Rater Notes

20. Manufacturer filter media boxes designed to accomplish this purpose meet these requirements. Per ASHRAE 62.2-2007, ducted mechanical systems are those that supply air to an occupiable space through ductwork exceeding 10 ft in length and through a thermal conditioning component, except for evaporative coolers.



ENERGY STAR Qualified Homes Water Management System Builder Checklist^{1,2,3}

Home Address: _____ City: _____ State: _____			
Inspection Guidelines	Must Correct	Builder Approved	N/A
1. Water-Managed Site and Foundation			
1.1 Patio slabs, walks, and driveways sloped ≥ 0.25 in. per ft. away from home to edge of surface or 10 ft., whichever is less. ⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Final grade is, or is scheduled by builder to be, sloped ≥ 0.5 in. per ft. away from home for ≥ 10 ft. and back-fill tamped to prevent settling ⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Capillary break beneath all concrete slabs using either: ⁵			
1.3.1 4 in. bed of ≥ 0.5 in. clean aggregate covered with ≥ 6 mil polyethylene sheeting lapped 6-12 in. or ≥ 1 " extruded polystyrene insulation with taped joints, in direct contact with concrete slab above, OR ;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3.2 4 in. uniform layer of sand overlaid with geotextile drainage matting and covered with sheeting or ≥ 1 " extruded polystyrene insulation with taped joints.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4 Capillary break for all crawlspace floors using either: ⁶			
1.4.1 Concrete slab over ≥ 6 mil polyethylene sheeting, lapped 6-12 in., OR ;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4.2 ≥ 6 mil polyethylene sheeting, lapped 6-12 in. and attached to bottom of walls and piers with furring strips or equivalent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5 Exterior surface of below-grade walls finished as follows: <ul style="list-style-type: none"> • For poured concrete, concrete masonry, and insulated concrete forms, finish with damp-proofing coating • For wood framed walls, finish with polyethylene and adhesive or other equivalent waterproofing 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6 Permeability of materials used on interior surface of below-grade exterior walls >0.1 ⁷	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.7 Sump pump covers mechanically attached with full gasket seal or equivalent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8 Drain tile surrounded with clean gravel and fabric filter ⁸	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Water-Managed Wall Assembly			
2.1 Flashing at bottom of exterior walls with weep holes included for masonry veneer and weep screed for stucco cladding systems, or equivalent drainage system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Fully sealed continuous drainage plane behind exterior cladding that laps over flashing in Section 2.1 ⁹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3 Window and door openings fully flashed ¹⁰	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Water-Managed Roof Assembly			
3.1 Step and kick-out flashing at all roof-wall intersections, extending ≥ 4 " on wall surface above roof deck and integrated with drainage plane above ¹¹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Gutters & downspouts empty to lateral piping that deposits water on sloping finish grade ≥ 5 ft. from foundation or to underground catchment system ≥ 10 ft. from foundation ¹²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 Self-sealing bituminous membrane or equivalent at all valleys and roof deck penetrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4 In 2009 IECC Climate Zones 5 and higher, self-sealing bituminous membrane or equivalent over sheathing at eaves, extending > 2 ft. up roof deck from wall plane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Water-Managed Building Materials			
4.1 Wall-to-wall carpet <u>not</u> installed within 2.5 feet of toilets, tubs, and showers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Cement board or equivalent moisture-resistant backing material installed on walls behind tub and shower enclosures composed of tile or panel assemblies with caulked joints. Paper-faced backerboard shall not be used. ¹³	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3 In Warm-Humid climates, permeability rating of materials used on interior side of exterior walls is > 0.1 except at shower and tub walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4 Building materials with visible signs of water damage or mold <u>not</u> installed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5 Interior walls <u>not</u> enclosed (e.g., with drywall) if either the framing members or insulation products have high moisture content ¹⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Builder Employee: _____			
Builder Signature: _____		Date: _____	
<i>Builder has completed Builder checklist in its entirety¹⁵</i>			
Rater Signature: _____		Date: _____	



ENERGY STAR Qualified Homes

Water Management System Builder Notes

1. The specifications in this checklist are designed to help improve moisture control in new homes compared with homes built to minimum code. However, these features alone cannot prevent all moisture problems. For example, leaky pipes or overflowing sinks or baths can lead to moisture issues and negatively impact the performance of this checklist's specified features.
2. This checklist shall be provided by the Rater to the Builder who shall complete the checklist. Upon completion, the Builder shall return the checklist to the Rater for review. If desired by the Builder, the Rater may verify any item on this checklist.
3. A completed and signed Indoor airPLUS Verification Checklist may be submitted in lieu of the Water Management System Builder checklist. For more information, see www.epa.gov/indoorairplus
4. Where setbacks limit space to less than 10 ft., swales or drains designed to carry water from foundation shall be provided. Backfill tamping is not required if proper drainage can be achieved using non-settling compact soils, as determined by a certified hydrologist, soil scientist, or engineer.
5. Polyethylene sheeting and aggregate bed are not required in Dry (B) climates as shown in 2009 IECC Figure 301.1 and Table 301.1, except in U.S. EPA Zone 1 Radon areas. In areas with free-draining soils, identified as Group 1 in the IRC by a certified hydrologist, soil scientist, or engineer through a site visit, a gravel layer or geotextile matting is not required.
6. Polyethylene sheeting is not required for raised-pier foundation with no walls. Polyethylene sheeting is also not required in Dry (B) climates or in Marine climates as shown in 2009 IECC Figure 301.1 and Table 301.1 if no air handler or return ducts are installed in the crawlspace. EPA recommends, but does not require, radon-resistant features for homes built in EPA Radon Zones 1, 2 and 3. For more information, see www.epa.gov/indoorairplus
7. Impermeable materials such as ceramic tile may be used at shower and tub walls.
8. Protected drain tile shall be installed at the footings of basement and crawlspace walls, level or sloped to discharge to outside grade (daylight) or to a sump pump. The top of each drain tile pipe shall always be below the bottom of the concrete slab or crawlspace floor. Each pipe shall be surrounded with at least 6 inches of $\frac{1}{2}$ to $\frac{3}{4}$ inc. washed or clean gravel. The gravel layer shall be fully wrapped with fabric cloth to prevent fouling of the drain tile.
9. Any of the following systems may be used: a monolithic weather-resistant barrier (i.e., house wrap) sealed or taped at all joints; weather resistant sheathings (e.g., faced rigid insulation) fully taped at all "butt" joints; lapped shingle-style building paper or felts; or other water-resistive barrier recognized by ICC-ES or other accredited agency.
10. Include pan flashing at sills, side flashing that extends over pan flashing, and top flashing that extends over side flashing.
11. Intersecting wall siding shall terminate 1 in. above the roof or higher, per manufacturer's recommendations. Continuous flashing shall be installed in place of step flashing for metal and rubber membrane roofs. Not required in dry climates as shown in 2009 IECC Figure 301.1 and Table 301.1.
12. Roof design without gutters is also acceptable if it deposits rainwater to a grade-level rock bed with a waterproof liner and a drain pipe that deposits water on a sloping finish grade \geq 5 ft. from foundation. Rainwater harvesting systems may also be used to meet this requirement when designed to properly drain overflow, meeting the discharge-distance requirements above.
13. Monolithic tub and shower enclosures (e.g., fiberglass with no seams) are exempt from this backing material requirement unless required by the manufacturer. Paper-faced backerboard may only be used behind monolithic enclosures and only if it meets ASTM mold-resistant standards.
14. For wet-applied insulation products, follow manufacturer's drying recommendations. As guidance, EPA recommends that lumber not exceed 18% moisture content.
15. The Rater is only responsible for ensuring that the Builder has completed the Builder checklist in its entirety. The Rater is not responsible for assessing the accuracy of the field verifications included in the Builder checklist. It is the builder's exclusive responsibility to ensure the design and installation comply with the Builder checklist specifications.