

EnergyStar v3.2

EnergyStar v3.2NextGEN

Presented By Robby Schwarz

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Thinking **ZERO** to 360°

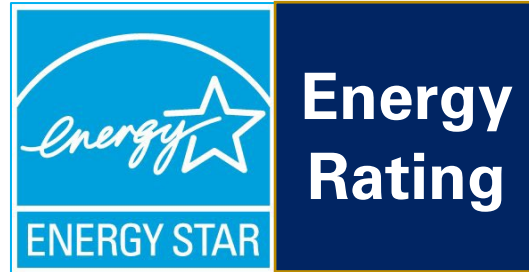
BUILD*Tank*inc.

Our Plan Ahead



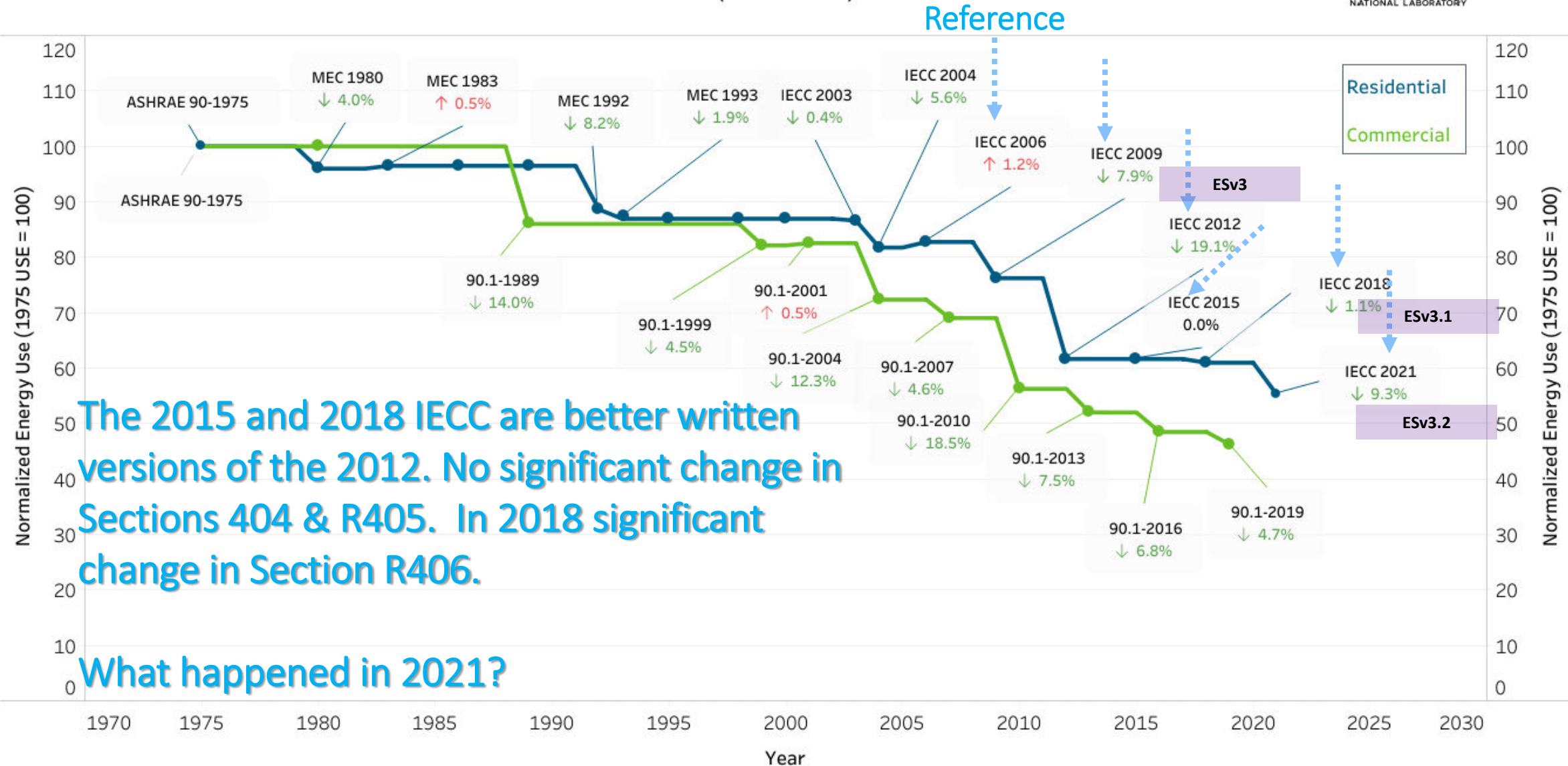
<https://www.orissapost.com/odisha-govt-warns-of-stringent-action-after-end-of-amnesty-scheme/>

Key Components of an ENERGY STAR Certified Home



Efficiency	<ul style="list-style-type: none">• Energy rating with features locked in
Comfort	<ul style="list-style-type: none">• Complete thermal enclosure system• Bedroom comfort vents
Air Quality	<ul style="list-style-type: none">• Whole-house fresh air system• Kitchen and bath fans that work well• MERV 6+ filter, properly installed• Combustion safety
Durability	<ul style="list-style-type: none">• Complete water management system





The 2015 and 2018 IECC are better written versions of the 2012. No significant change in Sections 404 & R405. In 2018 significant change in Section R406.

What happened in 2021?

#1. Pending sunset of National Version 3.0

- Implementation timelines updated to reflect that homes permitted on or after Jan. 01, 2023, will be required to meet National v3.1 instead of v3.0.




Single-Family New Homes Implementation Timeline

State / Territory	Homes Permitted ¹⁴ On or After This Date Must Meet the Adjacent Version & Revision	Version	Revision ¹⁵
AL, AK, AZ, AR, CO, IN, ID, KS, KY, LA, MS, MO, NH, NC, ND, OH, OK, SC, SD, TN, VA, WV, WI, WY	10-01-2020	National v3	Rev. 10
	01-01-2022	National v3	Rev. 11
	01-01-2023	National v3.1	Rev. 11
	01-01-2024	National v3.1	Rev. 12

Use EnergyStar Checklist Revision 12

#2. Incorporation of National v3.2 + misc. improvements


- Incorporated newly developed National Version 3.2 into program documents.



ENERGY STAR Single-Family New Homes

National Program Requirements, Version 3.2 (Rev. 12)

Eligibility Requirements
Site-built or modular ¹ Dwelling Units in certain low-rise buildings. See Footnote 1 for details.
While primarily intended for use in the ENERGY STAR SFNH program, this checklist may be used for other purposes.
For information about other ENERGY STAR programs, visit [energystar.gov](https://www.energystar.gov).
Note that compliance with the requirements of this checklist does not guarantee that a building will be eligible for the ENERGY STAR certification.



ENERGY STAR Single-Family New Homes

National Rater Design Review Checklist, Version 3 / 3.1 / 3.2 (Rev. 12)

If pursuing Track A - HVAC Grading, complete this page. ¹

Home Address: _____ City: _____ State: _____ Permit Date: _____

	Must Correct	Rater ² Verified	N/A ³
1. Partnership Status			
1.1 Rater has verified and documented that builder has an ENERGY STAR partnership agreement using energystar.gov/ResPartnerDirectory . ⁴	<input type="checkbox"/>	<input type="checkbox"/>	-
2. High-Performance Fenestration			
2.1 Specified fenestration meets or exceeds 2009 IECC or, for National v3.2, 2021 IECC requirements. ^{5, 6}	<input type="checkbox"/>	<input type="checkbox"/>	-
3. High-Performance Enclosure			
3.1 Specified total building thermal envelope UA meets one of the following options. Note: Item 3.1.2 is not an option for National v3.2.			
3.1.1 Achieves ≤ 100% of the total UA resulting from the U-factors in 2009 IECC Table 402.1.3 or, for National v3.2, 2021 IECC Table 402.1.2. See exception in Fn. 7 ^{6, 7, 8, 9} OR;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Side Note #1:
URL has been updated in the RDRC

Side Note #2:
An 'N/A' column has been added to the RDRC

What is a Revision?

1

It clarifies

+

2

It simplifies

3

It improves

EnergyStar v3.2 Certification Process

- The certification process provides flexibility
- Assess **Customized specification** that are equivalent in performance to the ENERGY STAR Reference Design Home **through an** EPA-recognized Home Certification Organization (HCO)'s **Approved Software Rating Tool**
- The Energy Rating Software determines the **ENERGY STAR ERI Target Score**, which is the highest ERI value that each rated home may achieve to earn the ENERGY STAR



EnergyStar v3.2 Certification Process

Note:

- Measures within the EnergyStar checklists that are pertinent to the home are **Mandatory Requirements**
- The **checklists impose constraints on the efficiency measures selected**
 - (e.g., insulation levels, insulation installation quality, window performance, duct leakage, water management)
- Furthermore, **on-site power generation may not be used to meet the ENERGY STAR ERI Target**

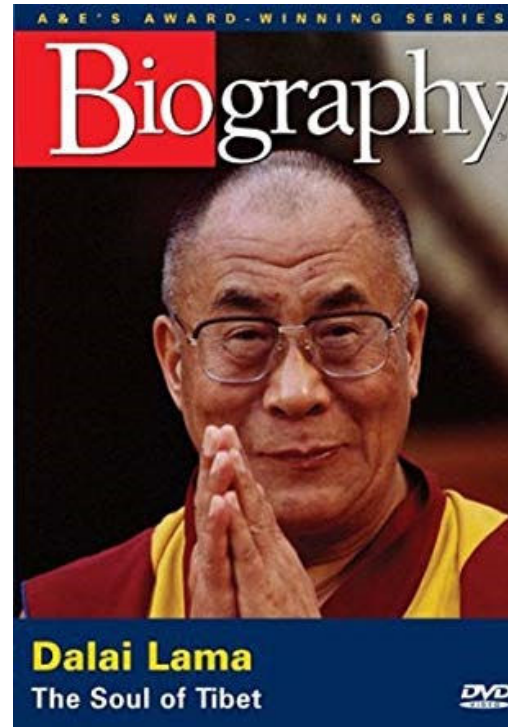


EnergyStar Foot Notes

**“Learn the rules so you
know how to break
them properly”**

Author: Dalai Lama

Date: Feb 25, 2008



<https://www.energy.gov/energysaver/energy-efficient-home-design/advanced-house-framing>



Example Footnotes

- 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 and adequate support to resist positive and negative pressures without displacement or damage. EPA recommends, but does not require, rigid air barriers.
- Insulation shall run behind interior / exterior wall intersections using ladder blocking, full length 2x6 or 1x6 furring behind the first partition stud, drywall clips, or other equivalent alternative.
- The Rater shall measure and record the external static pressure in the return-side and supply-side of the system using the contractor-provided test locations. However, at this time, the Rater need not assess whether these values are within a specific range to certify the home.



Example Footnote #15

- Slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade.
- Slab insulation shall extend to the top of the slab to provide a complete thermal break.
- If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall.
- Alternatively, the thermal break is permitted to be created using $\geq R-3$ rigid insulation on top of the slab. In such cases, up to 10% of the slab surface is permitted to not be insulated (e.g., for sleepers, for sill plates).
- Insulation installed on top of slab shall be covered by a durable floor surface (e.g., hardwood, tile, carpet).



Example Footnote #16

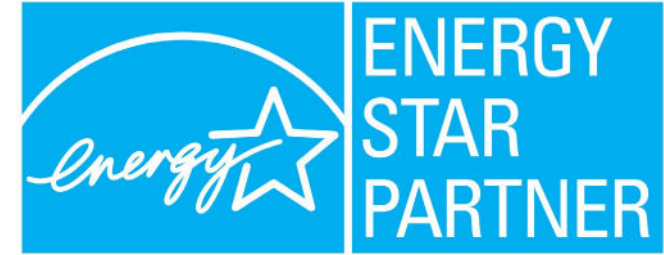
- Where an insulated wall separates a garage, patio, porch, or other unconditioned space from the conditioned space of the house, slab insulation shall also be installed at this interface to provide a thermal break between the conditioned and unconditioned slab.
- Where specific details cannot meet this requirement, partners shall provide the detail to EPA to request an exemption prior to the home's certification.
- EPA will compile exempted details and work with industry to develop feasible details for use in future revisions to the program.
- A list of currently exempted details is available at: energystar.gov/slabeledge.



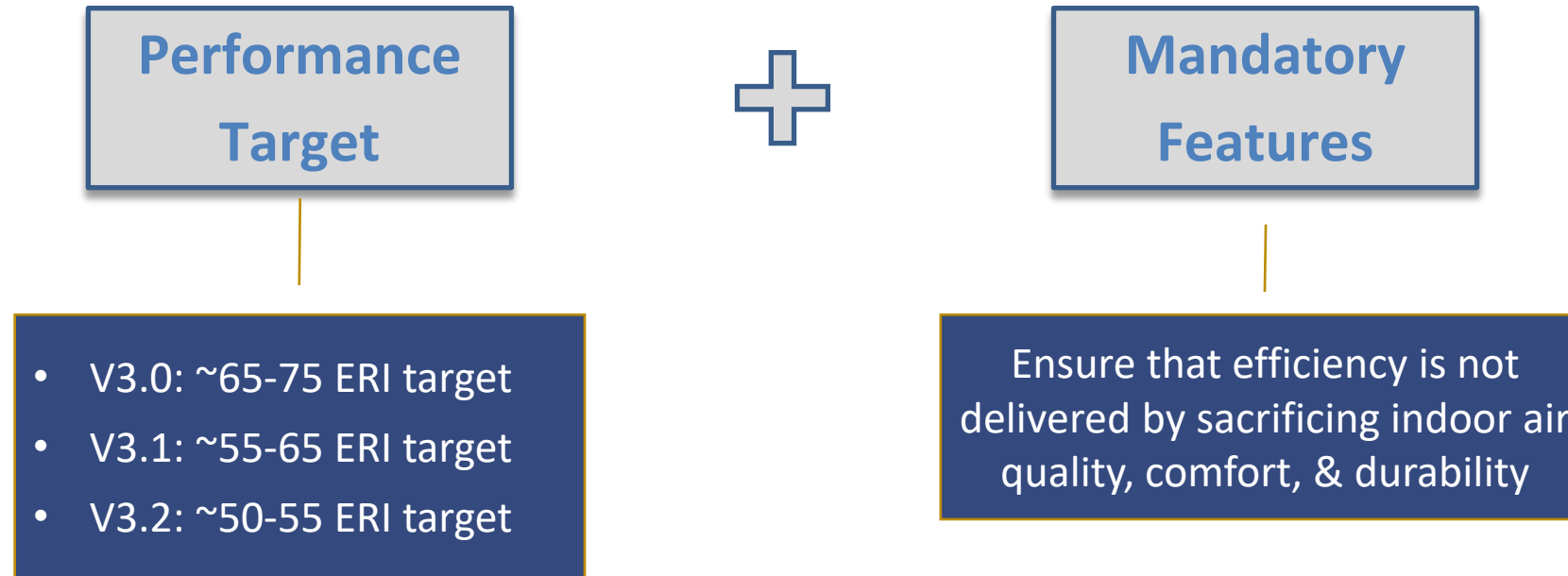
EnergyStar v3.2 Certification Process

Verification and Inspection

- Energy Raters operate under an HCO certification program
- Energy Raters verify that all requirements have been met in accordance with the Mandatory Requirements for All Certified Homes and with the inspection procedures for minimum rated features in ANSI / RESNET / ICC 301
- Energy Raters submit the home to the HCO for final certification and follow the HCO's certification and oversight procedures (e.g., quality assurance, recordkeeping, and reporting)
- The Rater is required to keep electronic or hard copies of the completed and signed National Rater checklists and the National HVAC Design Report
- It is recommended that Raters collect all checklist

A vertical form with a blue header. The header has the "energy" logo on the left and "CERTIFIED NEW HOME" in white text on a blue background. Below the header, the form has several white input fields with blue labels: "Address:", "Built by:", "Verified by:", "Date:", and "ENERGY STAR® for Homes Version Number:". Below these is a section for "Optional information:". At the bottom, there is a small disclaimer: "This home has been independently verified to meet EPA's strict guidelines for energy efficiency." and a link: "Learn more at energystar.gov".

EnergyStar v3.2 Certification Process



For Marshall Fire Rebuilds

Software has not been updated for modeling Esv3.2

EnergyStar guidance

Achieve an ERI of **50** or lower to prequalify the home



EnergyStar v3.2 Checklist

HVAC Contractor's Responsibilities

- HVAC Design Report
- HVAC Commissioning Checklist

Energy Rater's Responsibilities

- Energy Rater Design Review Checklist
- Energy Rater Field Checklist
- HVAC Design Supplement to Std. 310 Checklist

Builder's Responsibilities

- BUILDER Water Management Checklist



HVAC Design Report Page 1

- Design Overview
 - One report per system installed
 - Designer information
- Whole House Controlled Mechanical Ventilation
 - Air Flow
 - Ventilation System Type and Controls
 - Sound
 - Efficiency
 - Air Inlet Location
- Room-by-Room Heating and Cooling Loads
 - Outlines parameters of design



HVAC Designer Responsibilities:

- Complete one National HVAC Design Report for each system design for a house plan, created for either the specific plan configuration (i.e., elevation, option, orientation, & county) of the home to be certified or for a plan that is intended to be built with different configurations (i.e., different elevations, options, and/or orientations). Visit www.energystar.gov/newhomeshvacdesign and see Footnote 2 for more information. ²
- Obtain efficiency features (e.g., window performance, insulation levels, and infiltration rate) from the builder or Rater. ³
- Provide the completed National HVAC Design Report to the builder or credentialed HVAC contractor and to the Rater.

1. Design Overview

1.1 Designer name: _____ Designer company: _____ Date: _____

1.2 Select which party you are providing these design services to: ☐ Builder or ☐ Credentialed HVAC contractor

1.3 Name of company you are providing these design services to (if different than Item 1.1): _____

1.4 Area that system serves: ☐ Whole-house ☐ Upper-level ☐ Lower-level ☐ Other _____

1.5 Is cooling system for a temporary occupant load? ☐ Yes ☐ No

1.6 House plan: _____ Check box to indicate whether the system design is site-specific or part of a group: ²
☐ Site-specific design. Option(s) & elevation(s) modeled: _____
☐ Group design. Group #: _____ out of _____ total groups for this house plan. Configuration modeled: _____

2. Dwelling Unit Mechanical Ventilation System Design ("Vent System") ^{5, 6, 7} & Inlets in Return Duct ⁸


	Designer Verified
Airflow:	
2.1 Ventilation airflow design rate & run-time meet the requirements of ASHRAE 62.2-2010 or later. ⁹	<input type="checkbox"/>
2.2 Ventilation airflow rate required by 62.2 for a continuous system: _____ CFM	-
2.3 Design for this system: Vent. airflow rate: _____ CFM Run-time per cycle: _____ minutes Cycle time: _____ minutes	-
System Type & Controls:	
2.4 Specified system type: <input type="checkbox"/> Supply <input type="checkbox"/> Exhaust <input type="checkbox"/> Balanced	-
2.5 Specified control location: _____ (e.g., Master bath, utility room)	-
2.6 Specified controls allow the system to operate automatically, without occupant intervention.	<input type="checkbox"/>
2.7 Specified controls include a readily-accessible ventilation override and a label has also been specified if its function is not obvious (e.g., a label is required for a toggle wall switch, but not for a switch that's on the ventilation equipment).	<input type="checkbox"/>
2.8 For any outdoor air inlet designed to connect to a ducted return of the HVAC system, specified controls automatically restrict airflow using a motorized damper during ventilation off-cycle and occupant override. ^{8, 10}	<input type="checkbox"/>
Sound: 2.9 The fan of the specified system is rated ≤ 3 sones if intermittent and ≤ 1 sone if continuous, or exempted. ¹¹	<input type="checkbox"/>
Efficiency:	
2.10 If Vent System controller operates the HVAC fan, then HVAC fan operation is intermittent and either the fan type in Item 4.7 is ECM / ICM or the controls will reduce the run-time by accounting for HVAC system heating or cooling hours. ¹²	<input type="checkbox"/>
2.11 If bathroom fans are specified as part of the system, then they are ENERGY STAR certified. ¹³	<input type="checkbox"/>
Air Inlet Location: (Complete this section if system has a specified air inlet location; otherwise check "N/A"). ¹⁴	<input type="checkbox"/> N/A
2.12 Inlet pulls ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit.	<input type="checkbox"/>
2.13 Inlet is ≥ 2 ft. above grade or roof deck; ≥ 10 ft. of stretched-string distance from known contamination sources (e.g., stack, vent, exhaust, vehicles) not exiting the roof, and ≥ 3 ft. from known sources exiting the roof.	<input type="checkbox"/>

3. Room-by-Room Heating & Cooling Loads ¹⁵

3.1 Room-by-room loads calculated using: <input type="checkbox"/> Unabridged ACCA Manual J v8 <input type="checkbox"/> 2013 ASHRAE Fundamentals <input type="checkbox"/> Other per AHJ ¹⁶	-
3.2 Indoor design temperatures used in loads are 70°F for heating and 75°F for cooling.	<input type="checkbox"/>
3.3 Outdoor design temperatures used in loads: (See Footnote 17 and energystar.gov/hvacdesign temps) ¹⁷ County & State, or US Territory, selected: _____ Cooling season: _____ °F Heating season: _____ °F	-
3.4 Number of occupants used in loads: ¹⁸ _____	-
3.5 Conditioned floor area used in loads: ¹⁹ _____ Sq. Ft.	-
3.6 Window area used in loads: ²⁰ _____ Sq. Ft.	-
3.7 Predominant window SHGC used in loads: ²¹ _____	-
3.8 Infiltration rate used in loads: ²² Summer: _____ Winter: _____	-
3.9 Mechanical ventilation rate used in loads: _____ CFM	-
Loads At Design Conditions (kBtu/h)	N NE E SE S SW W NW
3.10 Sensible heat gain (By orientation ²³):	-
3.11 Latent heat gain (Not by orientation):	-
3.12 Total heat gain (By orientation ²³):	-
3.13 Maximum – minimum total heat gain (Item 3.12) across orientations = _____ kBtu/h Variation is ≤ 8 kBtu/h. ^{23, 24}	<input type="checkbox"/>
Heating 3.14 Total heat loss (Not by orientation):	-

HVAC Design Report Page 2

- Heating and Cooling equipment Selection
 - Manual S / Systems capacity
 - Air Conditioner/Heat Pump model #
 - AHRI Reference numbers
- Furnace
 - Manual S / Systems capacity
- Duct design
 - Manual D system air flow
- Room by room duct flow

 **ENERGY STAR Single-Family New Homes**
National HVAC Design Report, Version 3 / 3.1 / 3.2 (Rev. 12) ¹

4. Heating & Cooling Equipment Selection ¹⁵ Designer Verified

4.1 Equipment selected per ACCA Manual S (see Footnote 25 & 26). ^{25, 26} ☐ N/A

Air Conditioner / Heat Pump (Complete if air conditioner or heat pump will be installed; otherwise check "N/A") ☐ N/A

4.2 Equipment type: ☐ Cooling-only air conditioner or ☐ Cooling & heating heat pump -

4.3 Condenser manufacturer & model: -

4.4 Evaporator / fan coil manufacturer & model: -

4.5 AHRI reference #: ²⁷ -

4.6 AHRI listed efficiency: _____ / _____ EER / SEER Air-source heat pump: _____ HSPF Ground-source heat pump: _____ COP -

4.7 Evaporator fan type: ☐ PSC ☐ ECM / ICM ☐ Other: -

4.8 Compressor type: ☐ Single-speed ☐ Two-speed ☐ Variable-speed -

4.9 Latent capacity at design conditions, from OEM expanded performance data: ²⁸ _____ kBtu/h -

4.10 Sensible capacity at design conditions, from OEM expanded performance data: ²⁸ _____ kBtu/h -

4.11 Total capacity at design conditions, from OEM expanded performance data: ²⁸ _____ kBtu/h -

4.12 Air-source heat pump capacity: At 17°F: _____ kBtu/h At 47°F: _____ kBtu/h ☐ N/A -

4.13 Cooling sizing % = Total capacity (Item 4.11) divided by maximum total heat gain (Item 3.12): _____ % -

4.14 Complete this Item if Condition B Climate will be used to select sizing limit in Item 4.15. Otherwise, check "N/A": ²⁹ ☐ N/A

4.14.1 Load sensible heat ratio = Max. sensible heat gain (Item 3.10) / Max. total heat gain (Item 3.12) = _____ % -

4.14.2 HDD / CDD ratio (Visit energystar.gov/hvacdesigntemps to determine this value for the design location) = _____ -

4.15 Check box of applicable cooling sizing limit from chart below: ^{25, 28} -

Equipment Type (Per Item 4.2) & Climate Condition (Per Item 4.14)	Compressor Type (Per Item 4.8)		
	Single-Speed	Two-Speed	Variable-Speed
For Cooling-Only Equipment or For Cooling Mode of Heat Pump in Condition A Climate	<input type="checkbox"/> Recommended: 90 – 115% Allowed: 90 – 130%	<input type="checkbox"/> Recommended: 90 – 120% Allowed: 90 – 140%	<input type="checkbox"/> Recommended: 90 – 130% Allowed: 90 – 160%
For Cooling Mode of Heat Pump in Condition B Climate	<input type="checkbox"/> 90% - 100%, plus 15 kBtu/h	<input type="checkbox"/> 90% - 100%, plus 15 kBtu/h	<input type="checkbox"/> 90% - 100%, plus 15 kBtu/h

4.16 Cooling sizing % (4.13) is within cooling sizing limit (4.15). ☐

Furnace (Complete if furnace will be installed; otherwise check "N/A"). ☐ N/A

4.17 Furnace manufacturer & model: -

4.18 Listed efficiency: _____ AFUE -

4.19 Total capacity: ³⁰ _____ kBtu/h -

4.20 Heating sizing % = Total capacity (Item 4.19) divided by total heat loss (Item 3.14): _____ % -

4.21 Check box of applicable heating sizing limit from chart below:

When Used for Heating Only	When Paired With Cooling
<input type="checkbox"/> 100 – 140%	<input type="checkbox"/> Recommended: 100 – 140% Allowed: 100 – 400%

4.22 Heating sizing % (4.20) is within heating sizing limit (4.21). ☐

5. Duct Design (Complete if heating or cooling equipment will be installed with ducts; otherwise check "N/A"). ¹⁵ ☐ N/A

5.1 Duct system designed for the equipment selected in Section 4, per ACCA Manual D. ☐

5.2 Design HVAC fan airflow: ³¹ Cooling mode _____ CFM Heating mode _____ CFM -

5.3 Design HVAC fan speed setting (e.g., low, medium, high): ³² Cooling mode _____ Heating mode _____ -


5.4 Design total external static pressure (corresponding to the mode with the higher airflow in Item 5.2): ³³ _____ IWC -

5.5 Room-by-room design airflows documented below (which must sum to the mode with the higher airflow in Item 5.2): ^{34, 35} -

Room Name	Design Airflow (CFM)	Room Name	Design Airflow (CFM)	Room Name	Design Airflow (CFM)
1		12		23	
2		13		24	
3		14		25	
4		15		26	
5		16		27	
6		17		28	
7		18		29	
8		19		30	
9		20		31	
10		21		32	
11		22		Total for all rooms	

HVAC Commissioning Checklist

- One Checklist per system installed
- Commissioning Overview
 - HVAC Credentialing information
- Refrigerant Charge Measurements
- Indoor HVAC Fan Air Flow Measurements
- Air Balancing of Supplies and Returns
 - Recommended but not required

 **ENERGY STAR Single-Family New Homes**
National HVAC Commissioning Checklist, Version 3 / 3.1 / 3.2 (Rev. 12) ^{1,2}

HVAC Commissioning Contractor Responsibilities:

- The commissioning contractor must be credentialed by an HVAC oversight organization to complete this checklist. One checklist must be completed and signed by the commissioning contractor for each HVAC system that is commissioned.
- The completed checklist for each commissioned system, along with the corresponding National HVAC Design Report, shall be retained by the contractor for a minimum of three years for quality assurance purposes. Furthermore, the contractor shall provide the completed checklist to the builder, the Rater ³ responsible for certifying the home, and the HVAC oversight organization upon request.
- Visit www.energystar.gov/newhomeshvac for information about the credential requirement and this checklist.

1. Commissioning Overview

1.1 Contractor name: _____ Contractor company: _____ Date: _____

1.2 Organization that your company is credentialed with: ☐ ACCA ☐ Advanced Energy ☐ NYSERDA

1.3 Builder client name: _____

1.4 Home address: _____ City: _____ State: _____ Zip code: _____

1.5 National HVAC Design Report corresponding to this system has been collected from designer or builder. ☐ Contractor-verified

1.6 Area that system serves, per Item 1.4 of National HVAC Design Report: ☐ Whole-house ☐ Upper-level ☐ Lower-level ☐ Other _____

1.7 House plan, per Item 1.6 of National HVAC Design Report: _____ ☐ Site-specific design ☐ Group design #: _____

2. Refrigerant Charge - Run system for 15 minutes before testing. If outdoor ambient temperature at the condenser is $\leq 55^{\circ}\text{F}$ or, if known, below the manufacturer-recommended minimum operating temperature for the cooling cycle, then the system shall include a TXV, the outdoor temperature shall be recorded in Item 2.1, and the contractor shall check "N/A" in this Section. ⁴ Ducted or non-ducted single-packaged systems (i.e., PTAC) are exempt from this section.

	Contractor Verified	N/A
2.1 Outdoor ambient temperature at condenser: _____ $^{\circ}\text{F}$ DB	-	-
2.2 Return-side air temperature inside duct near evaporator, during cooling mode: _____ $^{\circ}\text{F}$ WB	-	<input type="checkbox"/>
2.3 Liquid line pressure: _____ psig	-	<input type="checkbox"/>
2.4 Liquid line temperature: _____ $^{\circ}\text{F}$ DB	-	<input type="checkbox"/>
2.5 Suction line pressure: _____ psig	-	<input type="checkbox"/>
2.6 Suction line temperature: _____ $^{\circ}\text{F}$ DB	-	<input type="checkbox"/>
For System with Thermal Expansion Valve (TXV):		
2.7 Condenser saturation temperature: _____ $^{\circ}\text{F}$ DB (Using Item 2.3)	-	<input type="checkbox"/>
2.8 Subcooling value: _____ $^{\circ}\text{F}$ DB (Item 2.7 - Item 2.4)	-	<input type="checkbox"/>
2.9 OEM subcooling goal: _____ $^{\circ}\text{F}$ DB	-	<input type="checkbox"/>
2.10 Subcooling deviation: _____ $^{\circ}\text{F}$ DB (Item 2.8 - Item 2.9)	-	<input type="checkbox"/>
For System with Fixed Orifice:		
2.11 Evaporator saturation temperature: _____ $^{\circ}\text{F}$ DB (Using Item 2.5)	-	<input type="checkbox"/>
2.12 Superheat value: _____ $^{\circ}\text{F}$ DB (Item 2.6 - Item 2.11)	-	<input type="checkbox"/>
2.13 OEM superheat goal: _____ $^{\circ}\text{F}$ DB (Using superheat tables and Items 2.1 & 2.2)	-	<input type="checkbox"/>
2.14 Superheat deviation: _____ $^{\circ}\text{F}$ DB (Item 2.12 - Item 2.13)	-	<input type="checkbox"/>
2.15 Item 2.10 is $\pm 3^{\circ}\text{F}$ or Item 2.14 is $\pm 5^{\circ}\text{F}$	<input type="checkbox"/>	<input type="checkbox"/>
2.16 An OEM test procedure (e.g., as defined for a ground-source heat pump) has been used in place of the sub-cooling or super-heat process and documentation has been attached that defines this procedure.	<input type="checkbox"/>	<input type="checkbox"/>

HVAC Design Supplement to Std. 310 Checklist

- Whole House Mechanical Ventilation
 - Air Flow
 - Systems Control
 - Sound
 - Efficiency
 - Air Inlet Location
- Local/Spot Ventilation
 - Kitchen
 - Bathrooms
- Air Conditioners/Heat Pumps
- Furnaces
 - Duct Design



ENERGY STAR Single-Family New Homes, All Versions (Rev. 11)
ENERGY STAR Multifamily New Construction, All Versions (Rev. 02)
National HVAC Design Supplement to Std. 310 for Dwellings & Units ¹

1. Design Basis			
1.1 Design description (optional):			
1.2 Designer company:		Designer name:	Date:
2. Dwelling Unit Mechanical Ventilation System Design ("Vent System") & Inlets in Return Duct ^{2,3,4}			
Airflow:			
2.1 Ventilation airflow design rate & run-time for each Vent System meets ASHRAE 62.2-2010 or later edition. ⁶		<input type="checkbox"/>	
2.2 Access point is specified for Rater to measure ventilation airflow rate and inspect any motorized / shutoff dampers. ^{4,7}		<input type="checkbox"/>	
System Controls:			
2.3 Specified controls for each Vent System allow it to operate automatically, without occupant intervention.		<input type="checkbox"/>	
2.4 Specified controls for each Vent System include a readily-accessible override & a label has also been specified if its function is not obvious (e.g., a label is required for a toggle wall switch, but not for a switch that's on the vent. equip.). ⁸		<input type="checkbox"/>	
2.5 For any outdoor air inlet designed to connect to a ducted return of the HVAC system, specified controls automatically restrict airflow using a motorized damper during ventilation off-cycle and occupant override. ^{4,9}		<input type="checkbox"/>	<input type="checkbox"/>
Sound: 2.6 Specified fan of each Vent System is rated ≤ 3 sones if intermittent and ≤ 1 sone if continuous, or exempted. ¹⁰		<input type="checkbox"/>	
Efficiency: (Complete if Vent System controller operates HVAC fan or Vent System uses bath fans; otherwise, check "N/A")		<input type="checkbox"/>	
2.7 If Vent System controller operates the HVAC fan, then HVAC fan operation is intermittent and either fan type in HVAC design report is ECM or controls will reduce the run-time by accounting for HVAC system heating or cooling hours. ¹¹		<input type="checkbox"/>	<input type="checkbox"/>
2.8 If bathroom fans are specified as part of any Vent System, then they are ENERGY STAR certified. ¹²		<input type="checkbox"/>	<input type="checkbox"/>
2.9 MFNC Only: ¹³ If central exhaust fans are specified as part of the Vent System, then if ≤ 1 HP, they are direct-drive, ECM, with variable speed controllers; and if > 1 HP, they are specified with NEMA Premium™ Motors or equivalent.		<input type="checkbox"/>	<input type="checkbox"/>
Air Inlet Location: (Complete this section if system has a specified air inlet location; otherwise check "N/A") ¹⁴		<input type="checkbox"/>	
2.10 Inlet(s) pull ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit.		<input type="checkbox"/>	
2.11 Inlet(s) are ≥ 2 ft. above grade or roof deck; ≥ 10 ft. of stretched-string distance from known contamination sources (e.g., stack, vent, exhaust, vehicles) not exiting the roof, and ≥ 3 ft. from known sources exiting the roof.		<input type="checkbox"/>	
2.12 Inlet(s) are provided with rodent / insect screen with ≤ 0.5 inch mesh.		<input type="checkbox"/>	
3. Dwelling Unit Local Mechanical Exhaust Design			
3.1 System(s) are designed that mechanically exhaust air from each dwelling unit kitchen and bathroom directly to the outdoors or to ventilation risers and meet the requirements in Table 1. ¹⁵		<input type="checkbox"/>	
Kitchens:	Runtime: ¹⁶ <input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent ¹⁷	Dwelling Units Served by Fan: ¹⁸ <input type="checkbox"/> Single Unit <input type="checkbox"/> Multiple Units	
Bathrooms:	Runtime: ¹⁶ <input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent ¹⁷	Dwelling Units Served by Fan: ¹⁸ <input type="checkbox"/> Single Unit <input type="checkbox"/> Multiple Units	
4. Heating Equipment, Cooling Equipment, & Equipment Controls Selection			
4.1 MFNC Only: ¹⁹ If using Prescriptive Path, equipment serving dwelling units meet the efficiency levels specified in Exhibit X of the National Rater Field Checklist, have programmable thermostatic controls, & do not use electric resistance heating.		<input type="checkbox"/>	<input type="checkbox"/>
4.2 MFNC Only: ¹⁹ Thermostatic controls for systems serving a dwelling unit are within the unit and not located on exterior walls. If more than one system provides heating or cooling to the same space, controls prevent simultaneous operation.		<input type="checkbox"/>	<input type="checkbox"/>
Air Conditioners & Heat Pumps If none will be installed, check N/A <input type="checkbox"/>		1	2
4.3 Unique name or ID for each system:			
4.4 Maximum sensible and total heat gain load of zone served (kBtu/h):			
4.5 Sensible, latent, & total cooling capacity at design conditions (kBtu/h): ¹⁹			
4.6 If HP, heating capacity at 17°F and at 47°F (kBtu/h):		N/A <input type="checkbox"/>	N/A <input type="checkbox"/>
4.7 Compressor speed type:			
4.8 Cooling sizing % & applicable sizing limit key from Table 2: ^{20,21}			
4.9 If C2 chosen in Item 4.8, load sensible heat ratio & HDD / CDD ratio: ²²		N/A <input type="checkbox"/>	N/A <input type="checkbox"/>
4.10 Affirm that cooling sizing % is within cooling sizing limit (4.8):		<input type="checkbox"/>	<input type="checkbox"/>
Furnaces If none will be installed, check N/A <input type="checkbox"/>		1	2
4.11 Unique name or ID for each system:			
4.12 Total heat loss load of zone served (kBtu/h):			
4.13 Total heating capacity (kBtu/h):			
4.14 Heating sizing % & applicable sizing limit key from Table 3: ^{23,24}			
4.15 Affirm that heating sizing % is within heating sizing limit (4.14):		<input type="checkbox"/>	<input type="checkbox"/>
5. Duct Design 5.1 All duct requirements in Table 4 have been included in the design, where applicable.		<input type="checkbox"/>	<input type="checkbox"/>

Energy Rater Design Review Checklist

EnergyStar V3.2

- Choose either track A or Track B
- Track A
 - **ANSI 310 HVAC Grading**
 - HVAC Contractor does NOT have to be credentialed
- Track B
 - **Traditional ES Compliance**
 - The HVAC Contractor **Must** be credentialed



EnergyStar NextGen

- House must use Track A

Energy Rater Design Review Checklist Track A

- Builder Partnership Status
- High Performance Fenestration
- High Performance Insulation
- Review of ANSI / RESNET / ACCA Std. 310 HVAC Design Report with ENERGY STAR Supplement



ENERGY STAR Single-Family New Homes

National Rater Design Review Checklist, Version 3 / 3.1 / 3.2 (Rev. 12)

If pursuing Track A - HVAC Grading, complete this page. ¹						
Home Address: _____ City: _____ State: _____ Permit Date: _____						
1. Partnership Status				Must Correct	Rater ² Verified	N/A³
1.1 Rater has verified and documented that builder has an ENERGY STAR partnership agreement using energystar.gov/ResPartnerDirectory . ⁴				<input type="checkbox"/>	<input type="checkbox"/>	-
2. High-Performance Fenestration						
2.1 Specified fenestration meets or exceeds 2009 IECC or, for National v3.2, 2021 IECC requirements. ^{5,6}				<input checked="" type="checkbox"/>	<input type="checkbox"/>	-
3. High-Performance Enclosure						
3.1 Specified total building thermal envelope UA meets one of the following options. Note: Item 3.1.2 is not an option for National v3.2.						
3.1.1 Achieves $\leq 100\%$ of the total UA resulting from the U-factors in 2009 IECC Table 402.1.3 or, for National v3.2, 2021 IECC Table 402.1.2. See exception in Fn. 7 ^{6,7,8,9} OR;				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.2 For all Versions except National v3.2: Achieves $\leq 133\%$ of the total UA resulting from the U-factors in 2009 IECC Table 402.1.3, per guidance in Footnote 7, AND specified home infiltration does not exceed the following: ^{6,7,8,9}				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2009 IECC Climate Zone		1 - 2	3 - 4	5 - 7	8	
Infiltration Limit (ACH50)		≤ 3.0	≤ 2.5	≤ 2.0	≤ 1.5	
4a. Review of ANSI / RESNET / ACCA / ICC 310 HVAC Design Report with ENERGY STAR Supplement ¹⁰						
4a.1 HVAC design report compliant with ANSI / RESNET / ACCA / ICC 310, and the National HVAC Design Supplement to Std. 310 for Dwellings & Units, collected for records, with no applicable Items left blank. ¹¹				<input type="checkbox"/>	<input type="checkbox"/>	-
4a.2 ANSI / RESNET / ACCA / ICC 310 design review criteria have been met for applicable housing type.				<input type="checkbox"/>	<input type="checkbox"/>	-
4a.3 Cooling sizing % is within the cooling sizing limit selected by the HVAC designer.				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____					Date of Review: _____	
Rater Signature: _____					Rater Company Name: _____	



HVAC Grading Update on Implementation

HVAC Design Supplement to Std. 310 Checklist

The Five Key Sequential Tasks in Standard 310

Task 1	Task 2	Task 3	Task 4	Task 5
Design Review	Total Duct Leakage	Blower Fan Airflow	Blower Fan Watt Draw	Refrigerant Charge

HVAC grading makes it easier to certify ENERGY STAR homes and apartments:

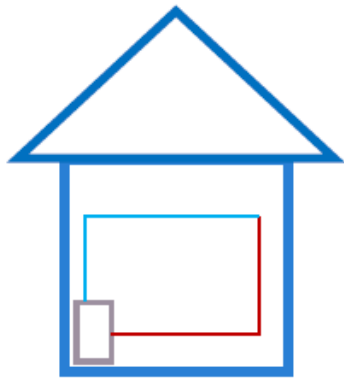
- Integrates most ENERGY STAR HVAC requirements into an ERI rating
- For eligible systems, does not require a credentialed HVAC contractor / FT agent
- For eligible systems, eliminates / streamlines the HVAC Commissioning Checklist
- Rewards proper installation with ERI points and helps meet the 45L tax credit



#3. Clarifications on HVAC design documentation (cont.)

- Track A – HVAC Grading. New footnote added to Rater Design Review Checklist to reinforce when design review must be done:
 - The Std. 310 design report must always be collected and reviewed per the Standard's design review criteria.
 - If the home has an AC or HP, then also meet the sizing limit in Item 4a.2.

Example



**Home with
boiler & no AC**

1. Even though home does not have forced-air systems that can be graded, collect the completed Std. 310 design report.
 2. Review report to ensure it meets Std. 310 design review criteria.
- Note that no cooling sizing check is required because there is no cooling system.

#3. Clarifications on HVAC design documentation (cont.)

- Track A – HVAC Grading. Added an allowance to collect the National HVAC Design Report in lieu of the National HVAC Design Supplement to Std. 310:

11. As an alternative, the ENERGY STAR National HVAC Design Report may be collected in lieu of the ENERGY STAR National HVAC Design Supplement to Std. 310 for Dwellings & Units. In such cases, at least two documents will still be collected – an HVAC design report compliant with ANSI / RESNET / ACCA 310 plus the ENERGY STAR National HVAC Design Report. Note that for projects with more than one HVAC system, one ENERGY STAR National HVAC Design Report per system would need to be collected.

ANSI / RESNET / ACCA 310 HVAC Design Report ^{1,2}	
1. Design Basis & Architectural Scope	
1.1 Design description (optional):	
1.2 Designer company:	Designer name: Date:
1.3 Software name and version used to complete design: N/A <input type="checkbox"/>	
For a Dwelling / Townhouse, or Dwelling / Sleeping Unit Within (i.e., duplex):	
1.4 Architectural plan name or address of the property:	
1.5 Architectural options used in the design: ³	
1.6 Other architectural options that the design can be used with: ⁴	
For a Dwelling / Sleeping Unit Not Within a Dwelling or Townhouse (e.g., condo, apartment):	
1.7 Unique ID for the bldg. that the dwelling / sleeping unit is in: ⁵	
1.8 Architectural plan used in design (e.g., dwelling unit model):	
1.9 Other architectural plans that the design can be used with: ⁴	
1.10 Architectural options used in the design: ³	
1.11 Other architectural options that the design can be used with: ⁴	
1.12 Dwelling / sleeping unit location used in design: ⁷	



ENERGY STAR Single-Family New Homes National HVAC Design Report, Version 3 / 3.1 / 3.2 (Rev. 12) ¹	
ENERGY STAR	
HVAC Designer Responsibilities:	
<ul style="list-style-type: none">Complete one National HVAC Design Report for each system design for a house plan, created for either the specific plan configuration (i.e., elevation, option, orientation, & county) of the home to be certified or for a plan that is intended to be built with different configurations (i.e., different elevations, options, and/or orientations). Visit www.energystar.gov/newhomeshvacdesign and see Footnote 2 for more information. ²Obtain efficiency features (e.g., window performance, insulation levels, and infiltration rate) from the builder or Rater. ³Provide the completed National HVAC Design Report to the builder or credentialed HVAC contractor and to the Rater.	
1. Design Overview	
1.1 Designer name: Designer company: Date:	
1.2 Select which party you are providing these design services to: <input type="checkbox"/> Builder or <input type="checkbox"/> Credentialed HVAC contractor	
1.3 Name of company you are providing these design services to (if different than Item 1.1):	
1.4 Area that system serves: <input type="checkbox"/> Whole-house <input type="checkbox"/> Upper-level <input type="checkbox"/> Lower-level <input type="checkbox"/> Other	
1.5 Is cooling system for a temporary occupant load? ⁴ <input type="checkbox"/> Yes <input type="checkbox"/> No	
1.6 House plan: Check box to indicate whether the system design is site-specific or part of a group: ²	
<input type="checkbox"/> Site-specific design. Option(s) & elevation(s) modeled:	
<input type="checkbox"/> Group design. Group #: out of total groups for this house plan. Configuration modeled:	

- This allowance is less relevant now that ENERGY STAR supplement can be printed directly from Wrightsoft and EnergyGauge.

Energy Rater Design Review Checklist Track B

- Builder Partnership Status
- High Performance Fenestration
- High Performance Enclosure
- Review of ENERGY STAR National HVAC Design Report



ENERGY STAR Single-Family New Homes

National Rater Design Review Checklist, Version 3 / 3.1 / 3.2 (Rev. 12)

If pursuing Track B - HVAC Credential, complete this page.			
Home Address: _____ City: _____ State: _____ Permit Date: _____			
1. Partnership Status	Must Correct	Rater² Verified	N/A³
1.1 Rater has verified and documented that builder has an ENERGY STAR partnership agreement using energystar.gov/ResPartnerDirectory . ⁴	<input type="checkbox"/>	<input type="checkbox"/>	-
1.2 Rater has verified and documented ¹² that HVAC contractor holds credential required to complete National HVAC Commissioning Checklist, unless all equipment to be installed in home to be certified is an exempted type, in which case check "N/A". ¹³ HVAC Contractor Company Name: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. High-Performance Fenestration			
2.1 Specified fenestration meets or exceeds 2009 IECC or, for National v3.2, 2021 IECC requirements. ^{5, 6}	<input type="checkbox"/>	<input type="checkbox"/>	-
3. High-Performance Enclosure			
3.1 Specified total building thermal envelope UA meets one of the following options. Note: Item 3.1.2 is not an option for National v3.2.			
3.1.1 Achieves $\leq 100\%$ of the total UA resulting from the U-factors in 2009 IECC Table 402.1.3 or, for National v3.2, 2021 IECC Table 402.1.2. See exception in Fn. 7. ^{6,7,8,9} OR;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.2 For all Versions except National v3.2: Achieves $\leq 133\%$ of the total UA resulting from the U-factors in 2009 IECC Table 402.1.3, per guidance in Footnote 7, AND specified home infiltration does not exceed the following: ^{6,7,8,9}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2009 IECC Climate Zone	1 - 2	3 - 4
	Infiltration Limit (ACH50)	≤ 3.0	≤ 2.5
		5 - 7	8
		≤ 2.0	≤ 1.5
4b. Review of ENERGY STAR National HVAC Design Report^{14, 15}			
4b.1 National HVAC Design Report collected for records, with no applicable items left blank.	<input type="checkbox"/>	<input type="checkbox"/>	-
4b.2 National HVAC Design Report reviewed by Rater for the following parameters (National HVAC Design Report Item # in parenthesis):			
4b.2.1 Cooling season and heating season outdoor design temperatures used in loads (3.3) are within the limits defined for the State and County, or US Territory, where the home will be built, or the designer has provided an allowance from EPA to use alternative values. All limits are published at energystar.gov/hvacdesigntemps . Note that revised (i.e., 2019 Edition) limits are required to be used for all HVAC Design Reports generated after 10/01/2020. ¹⁶	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.2 Number of occupants used in loads (3.4) is within ± 2 of the home to be certified. ¹⁷	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.3 Conditioned floor area used in loads (3.5) is between 100 sq. ft. smaller and 300 sq. ft. larger than the home to be certified. ¹⁸	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.4 Window area used in loads (3.6) is between 15 sq. ft. smaller and 60 sq. ft. larger than the home to be certified, or, for homes to be certified with > 500 sq. ft. of window area, between 3% smaller and 12% larger. ¹⁹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.5 Predominant window SHGC used in loads (3.7) is within 0.1 of predominant value in the home to be certified. ²⁰	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.6 Sensible, latent, & total heat gain are documented (3.10 - 3.12) for the orientation of the home to be certified. ²¹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.7 The variation in total heat gain across orientations (3.13) is ≤ 6 kBtu/h. ²¹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4b.2.8 Cooling sizing % (4.13) is within the cooling sizing limit (4.15) selected by the HVAC designer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____ Date of Review: _____			
Rater Signature: _____ Rater Company Name: _____			

Energy Rater Field Checklist #1

Thermal Enclosure

- High performance Fenestration and Insulation
- Fully Aligned Air Barrier
- Reduced Thermal Bridging
- Air Sealing



Home Address:	City:	State:	Permit Date:	
Thermal Enclosure System				
1. High-Performance Fenestration & Insulation				
1.1 Fenestration meets or exceeds specification in Item 2.1 of the National Rater Design Review Checklist.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
1.2 Insulation meets or exceeds specification in Item 3.1 of the National Rater Design Review Checklist. ⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
1.3 All insulation achieves Grade 1 install, per ANSI / RESNET / ICC 301. Alternatives in Footnote 5. ^{5,6}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
2. Fully-Aligned Air Barriers ⁷ - At each insulated location below, a complete air barrier is provided that is fully aligned as follows:				
Ceilings: At interior or exterior horizontal surface of ceiling insulation in Climate Zones 1-3; at interior horizontal surface of ceiling insulation in Climate Zones 4-8. Also, at exterior vertical surface of ceiling insulation in all climate zones (e.g., using a wind baffle that extends to the full height of the insulation in every bay or a tabbed baffle in each bay with a soffit vent that prevents wind washing in adjacent bays). ⁸				
2.1 Dropped ceilings / soffits below unconditioned attics, and all other ceilings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walls: At exterior vertical surface of wall insulation in all climate zones; also at interior vertical surface of wall insulation in Climate Zones 4-8. ⁹				
2.2 Walls behind showers, tubs, staircases, and fireplaces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3 Attic knee walls and skylight shaft walls. ¹⁰	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4 Walls adjoining porch roofs or garages.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5 Double-walls and all other exterior walls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
Floors: At exterior vertical surface of floor insulation in all climate zones and, if over unconditioned space, also at interior horizontal surface including supports to ensure alignment. Alternatives in Footnotes 12 & 13. ^{11, 12, 13}				
2.6 Floors above garages, floors above unconditioned basements or crawlspaces, and cantilevered floors.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7 All other floors adjoining unconditioned space (e.g., rim / band joists at exterior wall or at porch roof).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Reduced Thermal Bridging				
3.1 For insulated ceilings with attic space above (i.e., non-cathedralized), Grade 1 insulation extends to the inside face of the exterior wall below and is $\geq R-21$ in CZ 1-5; $\geq R-30$ in CZ 6-8. ¹⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 For slabs on grade in CZ 4-8, 100% of slab edge insulated to $\geq R-5$ at the depth specified by the 2009 IECC and aligned with the thermal boundary of the walls. ^{15, 16}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 Insulation beneath attic platforms (e.g., HVAC platforms, walkways) $\geq R-21$ in CZ 1-5; $\geq R-30$ in CZ 6-8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4 At above-grade walls separating conditioned from unconditioned space, one of the following options used (rim / band joists exempted): ¹⁷				
3.4.1 Continuous rigid insulation, insulated siding, or combination of the two is: $\geq R-3$ in CZ 1-4; $\geq R-5$ in CZ 5-8 ^{18, 19, 20} OR;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.2 Structural Insulated Panels OR; Insulated Concrete Forms OR; Double-wall framing OR; ^{18, 21}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3 Advanced framing, including all of the items below: ²²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3a Corners insulated $\geq R-6$ to edge ²³ AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3b Headers above windows & doors insulated $\geq R-3$ for 2x4 framing or equivalent cavity width, and $\geq R-5$ for all other assemblies (e.g., with 2x6 framing) ²⁴ AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3c Framing limited at all windows & doors to one pair of king studs, plus one pair of jack studs per window opening to support the header and sill, AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3d Interior / exterior wall intersections insulated to same R-value as rest of exterior wall, ²⁵ AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3e Minimum stud spacing of 16 in. o.c. for 2x4 framing in all Climate Zones and, in CZ 6-8, 24 in. o.c. for 2x6 framing. ²⁶	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Air Sealing (Unless otherwise noted below, "sealed" indicates the use of caulk, foam, or equivalent material)				
4.1 Ducts, flues, shafts, plumbing, piping, wiring, exhaust fans, & other penetrations to unconditioned space sealed, with blocking / flashing as needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
4.2 Recessed lighting fixtures adjacent to unconditioned space ICAT labeled and gasketed. Also, if in insulated ceiling without attic above, exterior surface of fixture insulated to $\geq R-10$ in CZ 4-8.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3 Above-grade sill plates adjacent to conditioned space sealed to foundation or sub-floor. Gasket also placed beneath above-grade sill plate if resting atop concrete / masonry & adjacent to cond. space. ^{27, 28}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4 Continuous top plate or blocking is at top of walls adjoining unconditioned space, and sealed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5 Drywall sealed to top plate at all unconditioned attic / wall interfaces using caulk, foam, drywall adhesive (but not other construction adhesives), or equivalent material. Either apply sealant directly between drywall and top plate or to the seam between the two from the attic above.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6 Rough opening around windows & exterior doors sealed. ²⁹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
4.7 Walls that separate attached garages from occupiable space sealed and, also, an air barrier installed and sealed at floor cavities aligned with these walls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8 In multifamily buildings, the gap between the common wall (e.g., the drywall shaft wall) and the structural framing between units sealed at all exterior boundaries.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.9 Doors adjacent to unconditioned space (e.g., attics, garages, basements) or ambient conditions made substantially air-tight with weatherstripping or equivalent gasket.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.10 Attic access panels, drop-down stairs, & whole-house fans equipped with durable $\geq R-10$ cover that is gasketed (i.e., not caulked). Fan covers either installed on house side or mechanically operated. ³⁰	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Energy Rater Field Checklist #2

HVAC Systems

- Heating and Cooling Equipment Grading
- Duct Quality Installation
 - Rough and Final Duct leakage testing
- Whole House Mechanical Ventilation
 - Measured ventilation rate
- Local/Spot Ventilation
 - Measure flows
- Filtration
- Combustion Appliances

ENERGY STAR Single-Family New Homes		National Rater Field Checklist, Version 3 / 3.1 / 3.2 (Rev. 12)		
HVAC System ³¹		Must Correct	Rater Verified ²	N/A ³
5. Heating & Cooling Equipment - Complete Track A - HVAC Grading ³² or Track B - HVAC Credential ³³				
Track A	5a.1 Blower fan volumetric airflow is Grade I or II per ANSI / RESNET / ACCA / ICC 310.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5a.2 Blower fan watt draw is Grade I or II per ANSI / RESNET / ACCA / ICC 310.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5a.3 Refrigerant charge is Grade I per ANSI / RESNET / ACCA / ICC 310. See Footnote 34 for exemptions. ³⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Track B	5b.1 HVAC manufacturer & model number on installed equipment matches either of the following (check box): ³⁵ <input type="checkbox"/> National HVAC Design Report <input type="checkbox"/> Written approval received from designer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5b.2 External static pressure measured by Rater at contractor-provided test locations and documented below: ³⁶ Return-Side External Static Pressure: _____ IWC Supply-Side External Static Pressure: _____ IWC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5b.3 Permitted, but not required: National HVAC Commissioning Checklist collected, with no items left blank.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6. Duct Quality Installation (Applies to Heating, Cooling, Ventilation, Exhaust, & Pressure Balancing Ducts, Unless Noted in Footnote)			
6.1 Ductwork installed without kinks, sharp bends, compressions, or excessive coiled flexible ductwork. ³⁷		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2 Bedrooms pressure-balanced (e.g., using transfer grilles, jump ducts, dedicated return ducts, undercut doors) to achieve a Rater-measured pressure differential ≥ -3 Pa and $\leq +3$ Pa with respect to the main body of the house when all air handlers are operating. Test configuration and an alternative compliance option in Footnote 38. ³⁸		<input type="checkbox"/>	<input type="checkbox"/>	-
6.3 All supply and return ducts in unconditioned space, including connections to trunk ducts, are insulated to $\geq R-6$. ³⁹		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4 Rater-measured total duct leakage meets one of the following two options. Alternative in Footnote 41: ^{40, 41, 42}				
6.4.1 Rough-in: The greater of ≤ 4 CFM25 per 100 sq. ft. of CFA or ≤ 40 CFM25, with air handler & all ducts, building cavities used as ducts, & duct boots installed. All duct boots sealed to finished surface, Rater-verified at final. ⁴³		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4.2 Final: The greater of ≤ 8 CFM25 per 100 sq. ft. of CFA or ≤ 80 CFM25, with the air handler & all ducts, building cavities used as ducts, duct boots, & register grilles atop the finished surface (e.g., drywall, floor) installed. ⁴⁴		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5 Rater-measured duct leakage to outdoors the greater of ≤ 4 CFM25 per 100 sq. ft. of CFA or ≤ 40 CFM25. ^{40, 45}		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Dwelling Unit Mechanical Ventilation Systems ("Vent System") ⁴⁶ & Inlets in Return Duct ⁴⁷				
7.1 Rater-measured ventilation rate is within either ± 15 CFM or $\pm 15\%$ of design report value. ⁴⁸		<input type="checkbox"/>	<input type="checkbox"/>	-
7.2 A readily-accessible ventilation override control installed and also labeled if its function is not obvious (e.g., a label is required for a toggle wall switch, but not for a switch that's on the ventilation equipment). ⁴⁹		<input type="checkbox"/>	<input type="checkbox"/>	-
7.3 For any outdoor air inlet connected to a ducted return of the HVAC system (Complete if present; otherwise check "N/A"): ⁴⁷				<input type="checkbox"/>
7.3.1 Controls automatically restrict airflow using a motorized damper during vent. off-cycle and occupant override. ⁵⁰		<input type="checkbox"/>	<input type="checkbox"/>	-
7.3.2 Rater-measured vent. rate is ≤ 15 CFM or 15% above design value at highest HVAC fan speed. Alt. in Fn. 51. ⁵¹		<input type="checkbox"/>	<input type="checkbox"/>	-
7.4 System fan rated ≤ 3 sones if intermittent and ≤ 1 sone if continuous, or exempted. ⁵²		<input type="checkbox"/>	<input type="checkbox"/>	-
7.5 If Vent System controller operates the HVAC fan, then HVAC fan operation is intermittent and either the fan type is ECM / ICM or the controls will reduce the run-time by accounting for HVAC system heating or cooling hours. ⁵³		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.6 Bathroom fans are ENERGY STAR certified if used as part of the Vent System. ⁵⁴		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.7 Air inlet location (Complete if ventilation air inlet location was specified on design report; otherwise check "N/A"): ^{55, 56}				<input type="checkbox"/>
7.7.1 Inlet pulls ventilation air directly from outdoors and not from attic, crawlspace, garage, or adjacent dwelling unit.		<input type="checkbox"/>	<input type="checkbox"/>	-
7.7.2 Inlet is ≥ 2 ft. above grade or roof deck; ≥ 10 ft. of stretched-string distance from known contamination sources not exiting the roof, and ≥ 3 ft. distance from dryer exhausts and sources exiting the roof. ⁵⁷		<input type="checkbox"/>	<input type="checkbox"/>	-
7.7.3 Inlet is provided with rodent / insect screen with ≤ 0.5 inch mesh.		<input type="checkbox"/>	<input type="checkbox"/>	-
8. Local Mechanical Exhaust - In each kitchen and bathroom, a system is installed that exhausts directly to the outdoors and meets one of the following Rater-measured airflow and manufacturer-rated sound level standards: ^{48, 58}				
Location		Continuous Rate	Intermittent Rate ⁵⁹	
8.1 Kitchen	Airflow	≥ 5 ACH, based on kitchen volume ^{60, 61}	≥ 100 CFM and, if not integrated with range, also ≥ 5 ACH based on kitchen volume ^{60, 61, 62}	<input type="checkbox"/>
	Sound	Recommended: ≤ 1 sone	Recommended: ≤ 3 sones	<input type="checkbox"/>
8.2 Bathroom	Airflow	≥ 20 CFM	≥ 50 CFM	<input type="checkbox"/>
	Sound	Required: ≤ 1 sone	Recommended: ≤ 3 sones	<input type="checkbox"/>
9. Filtration				
9.1 MERV 6+ filter(s) installed in each ducted mech. system, designed so all return and mechanically supplied outdoor air passes through filter(s) prior to conditioning, and located to facilitate occupant access & regular service. ⁶³		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2 Filter access panel includes gasket and fits snugly against exposed edge of filter when closed to prevent bypass. ⁶⁴		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Combustion Appliances				
10.1 Furnaces, boilers, & water heaters are mechanically drafted or direct-vented. Alternatives in Footnote 67. ^{65, 66, 67}		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2 Fireplaces are mechanically drafted or direct-vented. Alternatives in Footnote 68. ^{65, 66, 68}		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.3 No unvented combustion appliances other than cooking ranges or ovens are located inside the home's pressure boundary. Alternative in Footnote 70. ^{65, 69, 70}		<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: _____



Builder Water Management Checklist

- Water Managed Site and Foundation
- Water Managed Wall Assemblies
- Water Managed Roof Assemblies
- Water Managed Building Materials

Builder Responsibilities:

- It is the exclusive responsibility of builders to ensure that each certified home is constructed to meet these requirements.
- While builders are not required to maintain documentation demonstrating compliance for each individual certified home, builders are required to develop a process to ensure compliance for each certified home (e.g., incorporate these requirements into the Scope of Work for relevant sub-contractors, require the site supervisor to inspect each home for these requirements, and / or sub-contract the verification of these requirements to a Rater²).
- In the event that the EPA determines that a certified home was constructed without meeting these requirements, the home may be decertified.

1. Water-Managed Site and Foundation

- 1.1 Impermeable surfaces (e.g., patio, porch, or plaza slabs; sidewalks; ramps; driveways) sloped ≥ 0.25 in. per ft. away from home to edge of surface or 10 ft., whichever is less.³
- 1.2 Back-fill has been tamped, and permeable surfaces sloped ≥ 0.5 in. per ft. away from home for ≥ 10 ft. Alternatives in Footnote.³
- 1.3 Capillary break beneath all slabs (e.g., slab on grade, basement slab) except crawlspace slabs using either: ≥ 6 mil polyethylene sheeting, lapped 6-12 in., or ≥ 1 in. extruded polystyrene insulation with taped joints.^{4, 5, 6}
- 1.4 Capillary break at all crawlspace floors using one of the following options:^{4, 5, 6}
 - 1.4.1 Concrete slab over one of the following materials:
 - 1.4.1a ≥ 6 mil polyethylene sheeting, lapped 6-12 in.; OR,
 - 1.4.1b ≥ 1 in. extruded polystyrene insulation with taped joints.
 - 1.4.2 ≥ 6 mil polyethylene sheeting, lapped 6-12 in., & installed using one of the following:
 - 1.4.2a Lapped up each wall or pier and fastened with furring strips or equivalent; OR,
 - 1.4.2b Secured in the ground at the perimeter using stakes.
- 1.5 Exterior surface of below-grade walls of basements & unvented crawlspaces finished as follows:
 - a) For poured concrete, masonry, & insulated concrete forms, finish with damp-proofing coating.⁷
 - b) For wood framed walls, finish with polyethylene and adhesive or other equivalent waterproofing.
- 1.6 Class 1 vapor retarder not installed on interior side of vapor permeable insulation in exterior below-grade walls.⁸
- 1.7 Sump pit cover mechanically attached with full gasket seal or equivalent.
- 1.8 Drain tile installed at basement and crawlspace walls, with the top of the drain tile pipe below the bottom of the concrete slab or crawlspace floor. Drain tile surrounded with ≥ 6 in. of $\frac{1}{2}$ to $\frac{3}{4}$ in. washed or clean gravel and with gravel layer fully wrapped with fabric cloth. Drain tile level or sloped to discharge to outside grade (daylight) or to a sump pit with a pump. If drain tile is on interior side of footing, then channel provided through footing to exterior side.⁹

2. Water-Managed Wall Assembly

- 2.1 Flashing at bottom of exterior walls, with weep holes included for anchored stone / masonry veneer and weep screed for adhered stone / masonry veneer or stucco cladding, or equivalent drainage system.¹⁰
- 2.2 Fully sealed continuous drainage plane behind exterior cladding that laps over flashing in Item 2.1 and fully sealed at all penetrations. Additional bond-break drainage plane layer provided behind all adhered stone / masonry veneer or stucco cladding.^{10, 11}
- 2.3 Window and door openings fully flashed.¹²

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 shingle-style with drainage plane above; boot / collar flashing at all roof penetrations.¹³
- 3.2 For homes that don't have a slab-on-grade foundation and do have expansive or collapsible soils, gutters & downspouts provided that empty to lateral piping that discharges water on sloping final grade ≥ 5 ft. from foundation, or to underground catchment system not connected to the foundation drain system that discharges water ≥ 10 ft. from foundation. Alternatives & exemptions in Footnote.^{4, 14, 15}
- 3.3 Self-adhering polymer-modified bituminous membrane at all valleys & roof deck penetrations.^{4, 16}
- 3.4 In 2009 IECC Climate Zones 5 & higher, self-adhering polymer-modified bituminous membrane over sheathing at eaves from the edge of the roof line to > 2 ft. up roof deck from the interior plane of the exterior wall.^{4, 16}

4. Water-Managed Building Materials

- 4.1 Wall-to-wall carpet not installed within 2.5 ft. of toilets, tubs, and showers.
- 4.2 Cement board or equivalent moisture-resistant backing material installed on all walls behind tub and shower enclosures composed of tile or panel assemblies with caulked joints. Paper-faced backerboard shall not be used.¹⁷
- 4.3 In Warm-Humid climates, Class 1 vapor retarders not installed on the interior side of vapor permeable insulation in above-grade walls, except at shower and tub walls.⁸
- 4.4 Building materials with visible signs of water damage or mold not installed or allowed to remain.¹⁸
- 4.5 Framing members & insulation products having high moisture content not enclosed (e.g., with drywall).¹⁹
- 4.6 For each condensate-producing HVAC component, corrosion-resistant drain pan (e.g., galvanized steel, plastic) included that drains to a conspicuous point of disposal in case of blockage. Backflow prevention valve included if connected to a shared drainage system.



ENERGY STAR

BUILT FOR A CLEAN ENERGY FUTURE

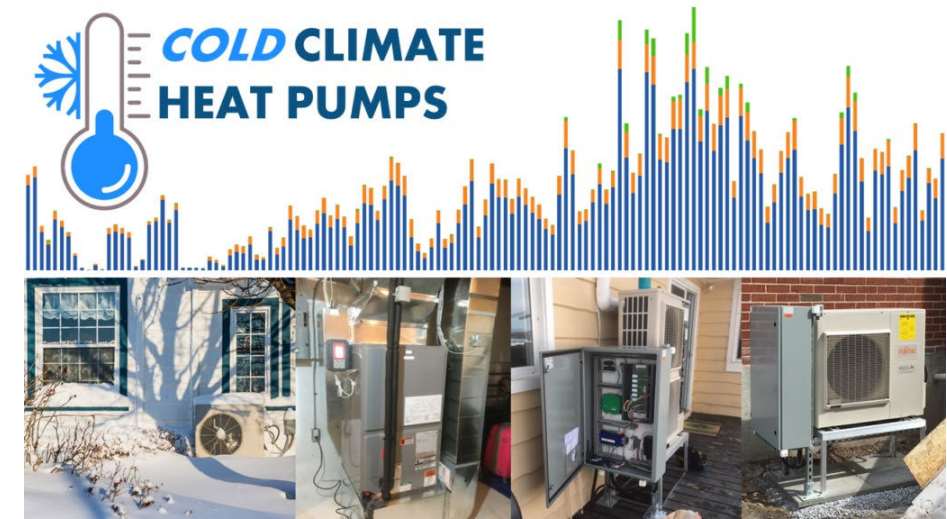
NextGen
CERTIFIED HOMES
& APARTMENTS



ENERGY STAR v3.2/NextGen Certified Homes

2. EnergyStar certified Connected Heat Pump

- ENERGY STAR certified two-speed or variable-speed heat pump installed that serves the design load of each heated zone
 - In Climate Zones 5-8, installed heat pumps are **ENERGY STAR Cold Climate certified**
- Each heat pump
- **must also meet EPA's 'connected' criteria or be controlled by an ENERGY STAR certified smart thermostat**
- Blower fan volumetric airflow, blower fan watt draw, and refrigerant charge are Grade I per ANSI / RESNET / ACCA Std. 310



3. ENERGY STAR Certified Heat Pump Water Heaters

- ENERGY STAR certified heat pump water heater that is 208/240 volts
- Each heat pump water heater has **minimum tank capacity** as follows:

Bedrooms	0 – 1	2	3	4
Tank Capacity	36	45	59	72

- Each heat pump water heater located within occupiable space has a sone rating <55 dBA
 - Listed** Tier 3 and 4 heat pump water heaters on [NEEA’s Advanced Water Heating Specification](#)
- Each heat pump water heater meets EPA’s **‘connected’** criteria



4. Induction /Electric Cooking

- Cooktops and range elements/burners use induction technology
- and ovens are electric or convection



5. Electric Vehicle Charging Infrastructure

Electric Vehicle – Ready charging station:

- One parking space is provided per dwelling unit that includes all of the items:
 - A powered 208/240 receptacle is installed in garage or within 3 feet of driveway or dedicated parking space*
 - The electric service panel includes a **40-amp breaker (or greater)**, and panel directory identifies the branch circuit as “Electric vehicle charging”



*Footnote #10

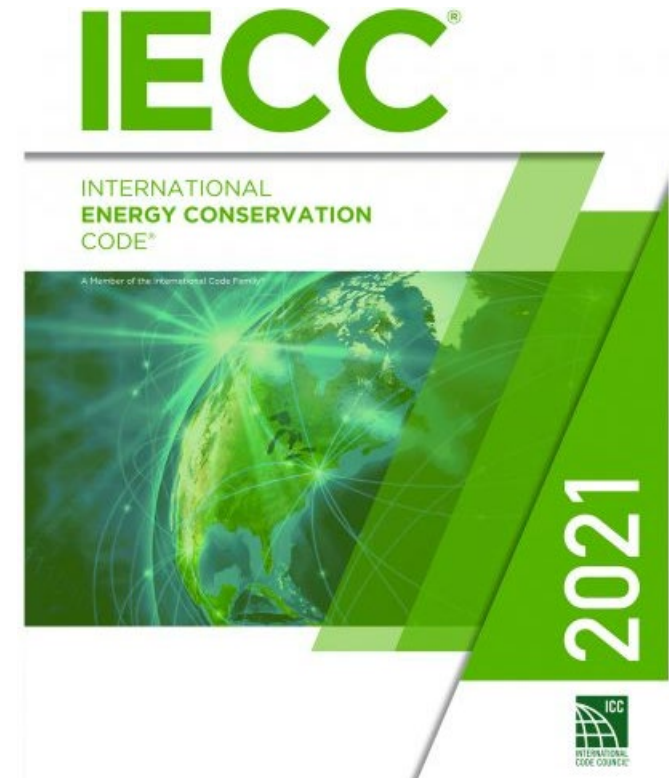
If the addition of the 40-amp Electric Vehicle Charging branch circuit increases the electrical service to the next nominal size (i.e., from 200-amp to 400-amp service), connecting the circuit to the electrical panel is not required. The Rater shall retain a copy of the electrical sizing calculations or statement from the electrical designer for their records but need not evaluate the documentation to certify the home.

State of Colorado Electrification Incentive

- Additional \$10,000
- Requires the 4 main NextGEN requirements
 1. Multi-stage ENERGY STAR certified connected heat pump
 2. ENERGY STAR certified connected heat pump water heater
 3. Induction cooktop* and electric oven
 4. Electric vehicle charging capability

5th REQUIREMENT

- Permit house using the 2021 IECC or UCBC BuildSmart Codes





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- High-efficiency heating and cooling system for improved comfort.
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reasons to
celebrate.



Thank you!

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303-927-0025

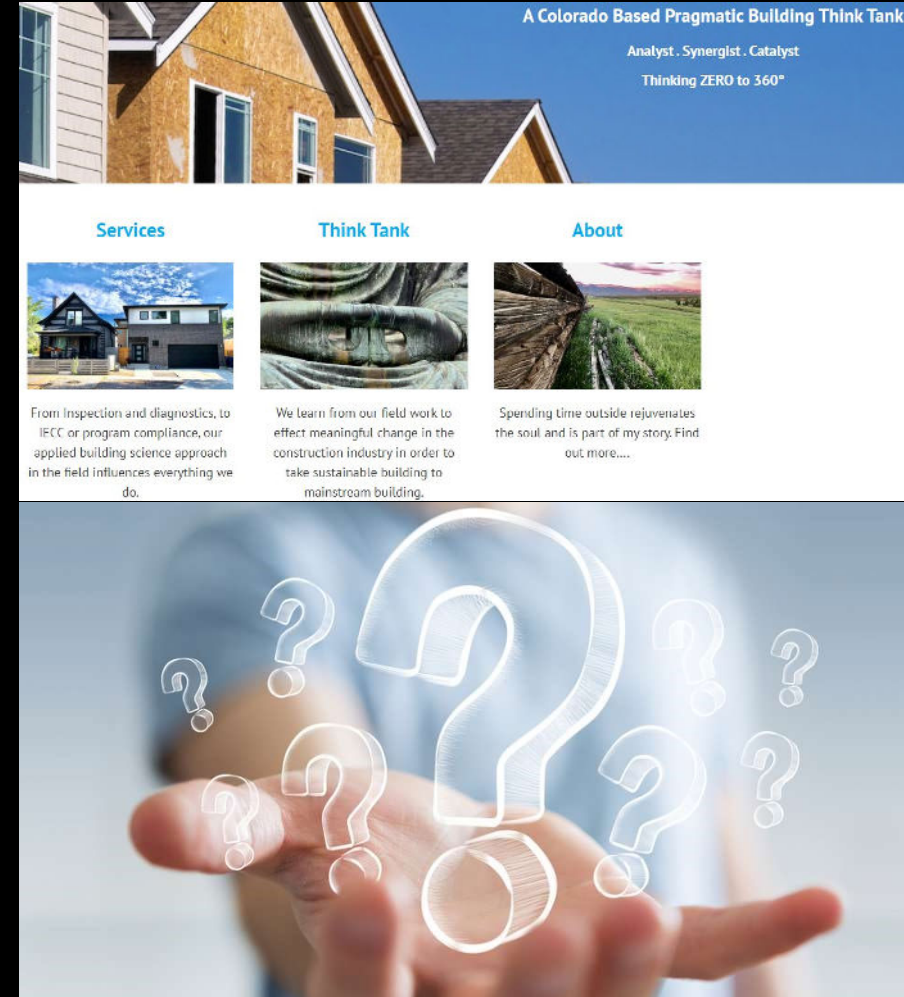
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