

ENERGY STAR. The simple choice for energy efficiency.



Stepping Up From the HERS Index to ENERGY STAR

RESNET Building Performance Conference

February 16th, 2015



Introduction



Value vs Cost



OR



ENERGY STAR. The simple choice for energy efficiency.



Value vs Cost



OR



OR



Value vs Cost

REVISION 08

OR





Value vs Cost of ENERGY STAR

- It takes more for a home to be ENERGY STAR certified than to complete a standard HERS rating, but the key questions are:
 - How much value does it add?
 - How much more does it cost?



Agenda

- The value of ENERGY STAR.
 - Five areas of added value relative to a HERS rating.
- The cost of ENERGY STAR.
 - Preview of Revision 08!
 - Stepping up from a HERS rating at:
 1. Plan review.
 2. Pre-drywall inspection.
 3. Final inspection.

The Value of ENERGY STAR





The Value of ENERGY STAR

1. Branding.



ENERGY STAR. The simple choice for energy efficiency.



Every single day,
consumers choose
ENERGY STAR
products more than

800,000 times



ENERGY STAR. The simple choice for energy efficiency.



Awareness
now exceeds **85%** and preference
is **growing**



ENERGY STAR. The simple choice for energy efficiency.



The Value of ENERGY STAR

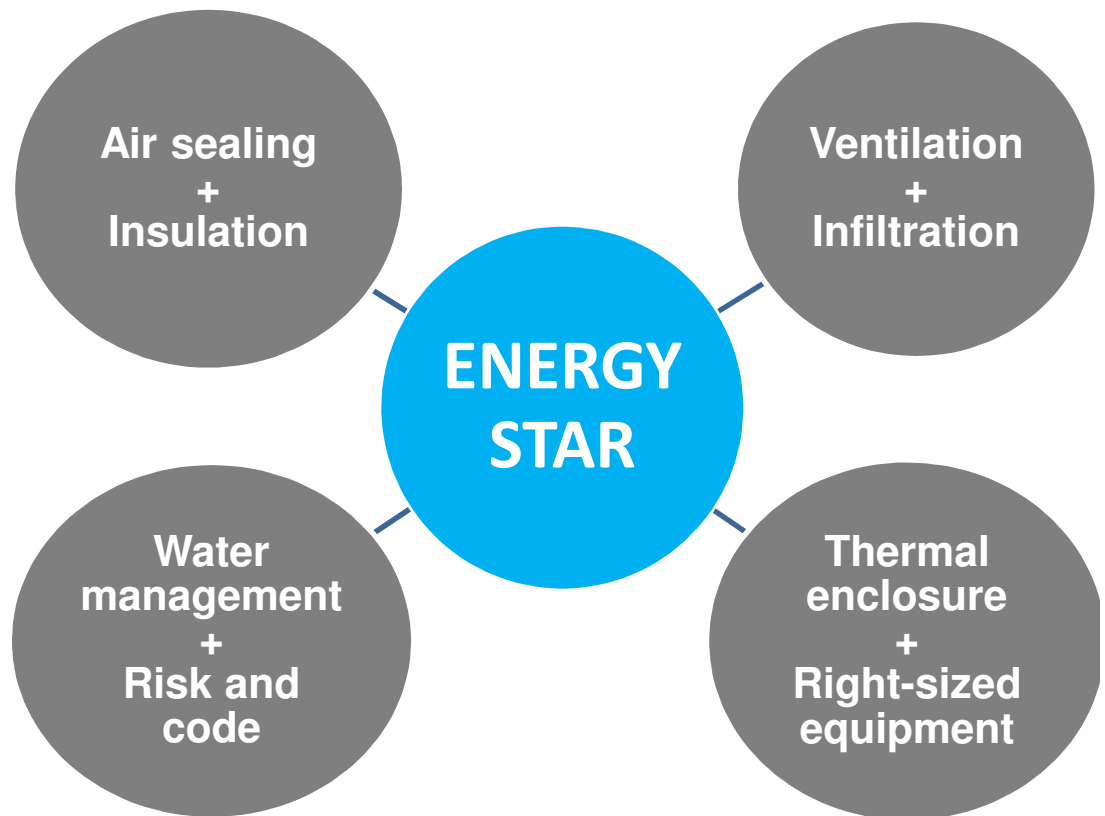
1. Branding.





The Value of ENERGY STAR

1. Branding.
2. Systems based approach.





The Value of ENERGY STAR

1. Branding.
2. Systems based approach.
3. Preparing for 2012 & 2015 IECC.



The Value of ENERGY STAR

1. Branding.
2. Systems based approach.
3. Preparing for 2012 & 2015 IECC.
4. Cost controls.



The Value of ENERGY STAR

1. Branding.
2. Systems based approach.
3. Preparing for 2012 & 2015 IECC.
4. Cost controls.
5. Risk mitigation.





The Value of ENERGY STAR

1. Branding.
2. Systems based approach.
3. Preparing for 2012 & 2015 IECC.
4. Cost controls.
5. Risk mitigation.



The Cost of ENERGY STAR





The Cost of ENERGY STAR

- How much does it really cost?
 - It depends..
 - .. but it may not be as much as you think.
 - EPA's most recent estimate is ~\$2,000-2,500 for a typical home..
 - .. but most of that cost is for measures to hit the HERS index target



The Cost of ENERGY STAR

- The average HERS Index of rated homes in 2013 was 64.
- This is the same ballpark as the ENERGY STAR HERS index target.



Audience Poll

- What is the average HERS Index of homes you rated in the last year?
 - 60 or below
 - 61 to 65
 - 66 to 70
 - Above 70
 - I'm not sure, or I didn't rate any homes

ENERGY STAR. The simple choice for energy efficiency.



REVISION 08



We're doing well. We're planning to do even better..

- Based on partner feedback, we want to address the following concerns:
 - Too much paperwork
 - Challenging workflow
 - Discomfort regarding Rater oversight of HVAC requirements



Guiding Principles for Revision 08

1. Keep, but streamline, the requirements that provide the most value.
2. Eliminate requirements that create the most hassle, and provide the least value.
3. Better align the process for ENERGY STAR with a HERS rating.



Preview of Revision 08: Greatly reduced paperwork

- Raters will no longer collect water management system checklist.
- Raters will no longer collect full load calculations, an AHRI certificate, or a test & balance report.
- Raters will no longer collect the HVAC system commissioning checklist.
- Raters will only collect a single HVAC design report per system design.
- Thermal Enclosure System and HVAC System Rater checklists will be consolidated into:
 - A half-page Rater Plan Review Checklist
 - A single-page Rater Field Inspection Checklist



Preview of Revision 08: Greatly improved workflow

- Old HVAC System QI Contractor Checklist split into two parts:
 - HVAC Design Report goes from designer to Rater once per system design, earlier in the process.
 - HVAC System Commissioning Checklist held by contractor; no longer collected by Rater.
- Rater Plan Review Checklist completed once per plan/system design, typically at same time as HERS modeling is completed.
- Rater Field Checklist has fewer items at final inspection, reducing uncertainty.



Preview of Revision 08: Reduced HVAC oversight role for Raters, for time-being

- No document collection from installing contractor.
- No more math check on refrigerant charge.
- No more collection or verification of Test & Balance report.
- No more basic system controls check.
- Streamlined visual inspections for ventilation inlets and exhaust ducts.
- Raters will continue to measure static pressure, but will no longer check against contractor readings.
- Sound limits for intermittent exhaust fans recommended, but not required.



Preview of Revision 08: Summary

HVAC System Design Report ¹
ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 08)

House Plan, Option(s), & Elevation(s): _____

System Description ² _____ Cooling system for temporary occupant load? ³ Yes ☐ No ☐

1. Whole-Building Mechanical Ventilation Design

System Description	Designer Verified ⁴	N/A						
A whole-house ventilation system has been designed and specified that meets the following requirements ⁵ :	<input checked="" type="checkbox"/>	-						
1.1 airflow: Ventilation airflow design rate & run-time meet the requirements of ASHRAE 62.2-2010 or 2013.	<input checked="" type="checkbox"/>	-						
Vent. Design Rate: _____ CFM Max. Cycle Time: _____ Hours Fractional On-Time: _____ Hours								
1.2 controls: System Type: <input type="checkbox"/> Supply <input type="checkbox"/> Exhaust <input type="checkbox"/> Balanced Control Location: _____ (e.g., Master bath, Utility room)								
1.2.1 Specified controls allow the system to operate automatically, without occupant intervention.	<input checked="" type="checkbox"/>	-						
1.2.2 A readily-accessible ventilation override control has been specified and a label has also been specified if its function is not obvious (e.g., a label is required for a standalone wall switch).	<input checked="" type="checkbox"/>	-						
1.2.3 If the system specifies an intake duct to the return side of the HVAC system, then the specified controls are designed to operate intermittently and automatically based on a timer and to restrict outdoor air intake when not in use (e.g., motorized damper). ⁶	<input checked="" type="checkbox"/>	-						
1.3 sound: The fan of the specified system shall not exceed ≤ 3 sones for intermittent systems and ≤ 1 sone for continuous systems (exceptions for HVAC and remote-mounted fans).	<input checked="" type="checkbox"/>	<input type="checkbox"/>						
1.4 efficiency:								
1.4.1 If system utilizes the HVAC fan, then the fan type shall be ECM / ICM, or the controls shall reduce the standalone ventilation run-time by accounting for hours when the HVAC system is heating or cooling.	<input checked="" type="checkbox"/>	-						
1.4.2 Bathroom fans used as part of a whole-house mechanical ventilation system shall be ENERGY STAR certified, unless rated flow rate ≤ 500 CFM.	<input checked="" type="checkbox"/>	-						
1.5 Air Inlet Location: If air inlet location is specified, it shall meet the following requirements:								
1.5.1 Inlet is not within an attic, crawlspace, garage or adjacent dwelling unit.	<input checked="" type="checkbox"/>	-						
1.5.2 Inlet is ≥ 3 ft. of stretched-string distance from known contamination sources (e.g., stack, vent, exhaust hood, or vehicle exhaust) exiting the roof and ≥ 10 ft. from known contamination sources not exiting the roof.	<input checked="" type="checkbox"/>	-						
	N	NE	E	SE	S	SW	W	NW
2.12 Latent Heat Gain (Btuh):								
2.13 Sensible Heat Gain (Btuh):								
2.14 Total Heat Gain (Btuh):								
2.15 Total Heat Loss (Btuh):								
2.16 Variation in Total Heat Gain (Value 2.13) Across Orientations $\leq 15\%$ ¹⁵	(Max. Gain - Min. Gain) / Min. Gain = _____ %							
2.17 Design HVAC Fan Airflow: ¹⁶	Cooling Mode _____ CFM Heating Mode _____ CFM							
2.18 Design HVAC Fan Speed Setting: ¹⁷	Cooling Mode _____ Heating Mode _____							
2.19 Design Total External Static Pressure: ¹⁸	_____ IWC							

• HVAC System Design Report

- Completed by HVAC designer.
- *Collected by Rater once per system design.*
- *Like a HERS model, once its created, can be used again and again.*



Preview of Revision 08: Summary

Rater Plan Review Checklist
ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 08)

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

1. Partnership Status Must Correct Rater Verified N/A

Rater Field Checklists
ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 08)

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

Thermal Enclosure System	Must Correct	Builder Verified	Rater Verified	N/A
1. Fenestration & Insulation				
1.1 Fenestration meets or exceeds performance selected in Item 2.1 of the Rater Design Review Checklist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Insulation meets or exceeds levels selected in Item 3.1 of the Rater Design Review Checklist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3 All insulation achieves RSENET-defined Grade 1 installation. See Footnote 3 for alternative. ¹	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Fully-Aligned Air Barriers ²				
At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows:				
• At interior or exterior surface of ceilings in Climate Zones 1-3; at interior surface of ceilings in Climate Zones 4-8. Also, include barrier at interior edge of attic eave in all climate zones using a wind baffle that extends to the full height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays ³				
• At exterior surface of walls in all climate zones; and also at interior surface of walls for Climate Zones 4-8 ⁴				
• At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edge ⁵				
2.1 Walls, Walls behind showers, tubs, staircases, and fireplaces	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Walls, Attic knee walls and skylight shaft walls ⁶	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3 Walls, Wall adjoining porch roof	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4 Walls, Garage rim / band joist adjoining conditioned space	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5 Walls, Double-walls and all other exterior walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.6 Floors, Floor above garage, floor above unconditioned basement or crawlspace, or cantilevered floor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.7 Ceilings, Dropped ceiling / soffit below unconditioned attic and all other ceilings	<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 at these levels: CZ 1-5: ≥ R-21; CZ 6-8: ≥ R-30 ¹⁴	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2 For stairs on grade in CZ 4 and higher, 100% of slab edge insulated to ≥ R-5 at the depth specified by the 2009 IRC and aligned with thermal boundary of the walls ¹⁵	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3 Insulation beneath attic platforms (e.g., HVAC platforms, walkways) ≥ R-21 in CZ 1-5; ≥ R-30 in CZ 6-8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4 One of the following options used at above-grade walls separating conditioned from unconditioned space (rim / band joists exempted): ¹⁶	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.1 Continuous rigid insulation, insulated siding, or combination of the two; ≥ R-5 in Climate Zones 1 to 4, ≥ R-6 in Climate Zones 5 to 8 ^{14, 16} , 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 ^{14, 17}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3 Advanced framing, including all of the items below:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3a Corners insulated ≥ R-6 to edge ¹⁸ , AND:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.4.3b Headers above windows & doors insulated ≥ R-3 for 2x4 framing or equivalent cavity width, and ≥ R-5 for all other assemblies (e.g., with 2x6 framing) ¹⁸ , 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. ¹⁹ , 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. ²⁰ , 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 Climate Zones 5 through 8, 24 in. o.c. for 2x6 framing. ²¹	<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"/>	<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 a R-10 in CZ 4 and higher.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3 Light tubes include lens separating unconditioned and conditioned space and are gasketed. ²²	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4 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 ^{23, 24}	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5 Continuous top plate or blocking at top of walls adjoining unconditioned space, and sealed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6 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"/>
4.7 Rough opening around windows & exterior doors sealed ²⁵	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8 All seams between Structural Insulated Panels sealed per manufacturer's instructions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.9 In multifamily buildings, the gap between the common wall (e.g. the drywall shaft wall) and the structure framing between units sealed at all exterior boundaries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.10 Doors adjacent to unconditioned space (e.g., attics, garages, basements) or ambient conditions made substantially airtight with weatherstripping or equivalent gasket	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.11 Attic access panels, drop-down stairs, & whole-house fans equipped with durable ≥ R-10 cover that is gasketed (i.e., not caulked). Fan covers either installed on house side or mechanically operated ²⁷	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Effective for homes permitted starting 5/01/2013 Revised 5/01/2013 Page 3 of 9

• Rater Plan Review Checklist

— ½ page.

— Contains checks on partnership/credential status, insulation, fenestration, and HVAC design.

— *Completed by Rater once per plan / system design.*

• Rater Field Inspection Checklist

— 1-page, front and back.

— Contains elements from old Thermal Enclosure System and HVAC System Rater Checklists.

— *Completed by Rater on every home.*



Preview of Revision 08: Summary

HVAC System Commissioning Contractor Checklist¹
ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 08)

The commissioning contractor must be pre-qualified, be responsible for these items, and shall sign this Checklist. The completed Checklist for each commissioned system shall be retained by the contractor for quality assurance purposes. Visit www.energystar.gov/newhomescheck for information about the pre-qualification requirement and this Checklist.

Home Address: _____ City: _____ State: _____ Zip Code: _____

1. Refrigerant Charge - Run system for 15 minutes before testing.
(Note: If outdoor ambient temperature at the condenser is $\geq 55^{\circ}\text{F}$ or, if known, below the manufacturer-recommended minimum operating temperature for the cooling cycle, then the system shall include a TXV, and the contractor shall mark "N/A" on the Checklist for this Section.)

	Contractor	Verified	N/A
1.1 Outdoor ambient temperature at condenser: _____ $^{\circ}\text{F}$ DB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Return-side air temperature inside duct near evaporator, during cooling mode: _____ $^{\circ}\text{F}$ WB	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Water Management System Builder Requirements^{1,2}
ENERGY STAR Certified Homes, Version 3 / 3.1 (Rev. 08)

1. Water-Managed Tile and Foundation

- 1.1 Patio slabs, porch slabs, walks, and driveways sloped ≥ 0.25 in. per ft. away from home to edge of surface or 10 ft., whichever is less. ¹
- 1.2 Backfill has been tamped and final grade sloped ≥ 0.5 in. per ft. away from home for ≥ 10 ft. See Footnote for alternatives. ²
- 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 a 1 in. extruded polystyrene insulation with taped joints. ^{1, 4}
- 1.4 Capillary break at all crawlspace floors using a 6 mil polyethylene sheeting, lapped 6-12 in., & installed using one of the following **options**. ^{1, 4}
 - 1.4.1 Placed beneath a concrete slab; OR,
 - 1.4.2 Lapped up each wall or pier and fastened with furring strips or equivalent; OR,
 - 1.4.3 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 air permeable insulation in ext. below-grade walls. ⁴
- 1.7 Sump pump covers mechanically attached with full gasket seal or equivalent.
- 1.8 Drain tile installed at the exterior side of footings of 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 a 6 in. of 16 to 24 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 pump. ⁸

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. 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 provided behind all stucco and non-structural masonry cladding wall assemblies. ^{11, 12}
- 2.3 Window and door openings fully flashed. ¹³

3. Water-Managed Roof Assembly

- 3.1 Step and kick-out flashing at all roof-wall intersections, extending a 4" on wall surface above roof deck and integrated shingle-style with drainage plane above; boot / collar flashing at all roof penetrations. ¹⁴
- 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 using 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. See Footnote for alternatives & exemptions. ^{1, 14}
- 3.3 Self-sealing bituminous membrane or equivalent at all valleys & roof deck penetrations. ⁴
- 3.4 In 2009 IECC Climate Zones 5 & higher, self-sealing bituminous membrane or equivalent 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

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. ¹⁵
- 4.3 In Warm-Humid climates, Class 1 vapor retarders not installed on the interior side of air permeable insulation in above-grade walls, except at shower and tub walls. ⁴
- 4.4 Building materials with visible signs of water damage or mold not installed or allowed to remain. ¹⁶
- 4.5 Framing members & insulation products having high moisture content not enclosed (e.g., with drywall). ¹⁷

• HVAC System Commissioning Checklist

— Completed / maintained by HVAC installing contractor .

— *Not collected by Rater.*

• Water Management System Builder Requirements

— No per-home documentation required to be completed by builder.

— *Not collected by Rater.*



Preview of Revision 08: Timeline

- Additional informal vetting with partners over next month.
- Expected release in May-June, 2015.
- Can be used immediately once released.



Key Takeaways for Revision 08

For Raters:

- Reduces all paperwork collection to a one-page report per plan.
- Greatly improves predictability at final inspection.
- Easier than ever to include ENERGY STAR certification in your offerings.

For Builders:

- Estimated to reduce costs by ~\$275 from Revision 07.
- Less hassle-factor for them and their trades.
- Continues to help improve performance and reduce cost of HVAC system.



HERS Ratings & ENERGY STAR

1. Phase 1: Plan Review
2. Phase 2: Pre-drywall Inspection
3. Phase 3: Final Inspection





Phase 1: Plan Review

Measure	Cost
Credentialed HVAC Contractor	\$25

ACCA QA



Advanced Energy QAP





Phase 1: Plan Review

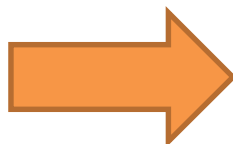
Measure	Cost
Credentialed HVAC Contractor	\$25
Mechanical ventilation	\$100 - 375

Phase 1: Plan Review

Measure	Cost
Credentialed HVAC Contractor	\$25
Mechanical ventilation	\$100 - 375
Reduction in cooling system size	(\$275 - 325)



3.5 tons



3.0 tons



Phase 1: Plan Review

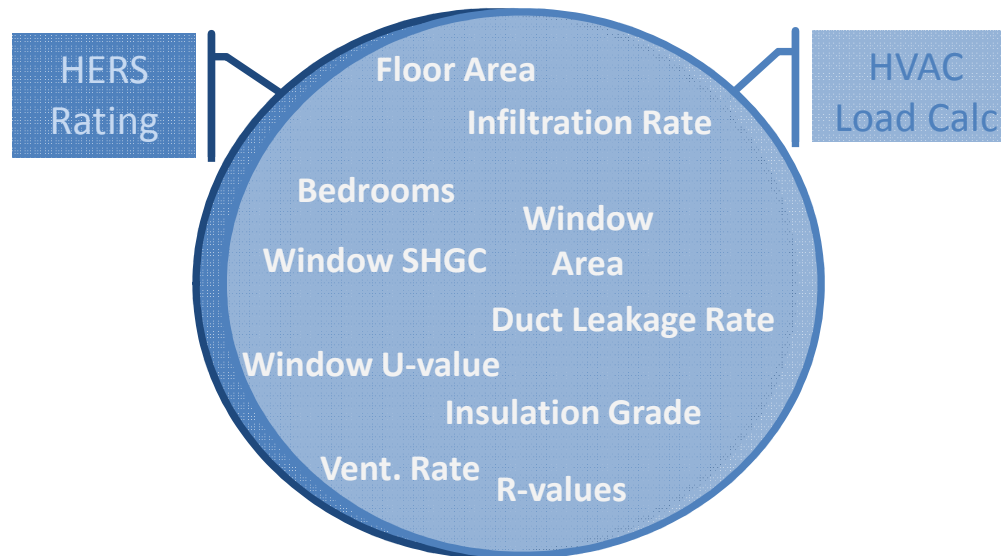
Measure	Cost
Credentialed HVAC Contractor	\$25
Mechanical ventilation	\$100 - 375
Reduction in cooling system size	(\$275 - 325)
Collection of HVAC System Design Report & completion of Rater Plan Review Checklist	\$50 \$25

Rev 08 Preview:

- Only document to collect is HVAC System Design Report.
- ½ page Rater Plan Review Checklist can be completed at design.
- Both only need to be done once per system design / plan.

Phase 1: Plan Review

- Raters verify key inputs of the load calculation to reduce improperly-sized equipment and comfort complaints.



Almost complete overlap in inputs!



Phase 1: Plan Review

Measure	Cost
Credentialed HVAC Contractor	\$25
Mechanical ventilation	\$100 - 375
Reduction in cooling system size	(\$275 - 325)
Collection of HVAC System Design Report & completion of Rater Plan Review Checklist	\$25
Total	\$175 savings up to \$150 cost

Phase 2: Pre-Drywall Inspection

Measure	Cost
Reduced thermal bridging	(\$125 - 175)



Phase 2: Pre-Drywall Inspection

Measure	Cost
Reduced thermal bridging	(\$125 - 175)
Completion of Thermal Enclosure System Section of Rater Field Checklist	\$75





Phase 2: Pre-Drywall Inspection

Measure	Cost
Reduced thermal bridging	(\$125 - 175)
Completion of Thermal Enclosure System Section of Rater Field Checklist	\$75
Total	(\$50 – 100)

Phase 3: Final Inspection

Measure	Cost
Duct blaster	\$0
Blower door	\$0

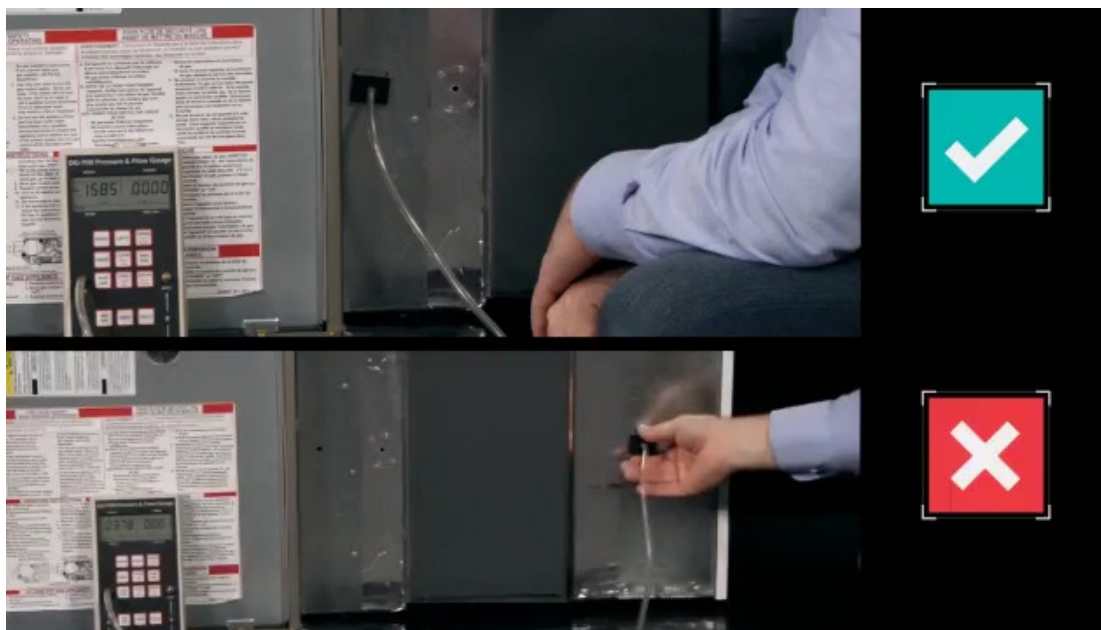


Phase 3: Final Inspection

Measure	Cost
Duct blaster	\$0
Blower door	\$0
Static pressure test (contractor & Rater verification)	\$25

Rev 08 Preview:

- Simply measure and move on.



Phase 3: Final Inspection

Measure	Cost
Duct blaster	\$0
Blower door	\$0
Static pressure test (contractor & Rater verification)	\$25
Refrigerant charge test (contractor & Rater verification)	\$25



Rev 08 Preview:

- No Rater math check of refrigerant charge



Phase 3: Final Inspection

Measure	Cost
Duct blaster	\$0
Blower door	\$0
Static pressure test (contractor & Rater verification)	\$25
Refrigerant charge test (contractor verification)	\$25
Room-by-room airflow testing	\$100 \$0
Filling out the contractor checklist with collected information	\$25

Rev 08 Preview:

- Test & balance recommended, but not required



Phase 3: Final Inspection

Measure	Cost
Duct blaster	\$0
Blower door	\$0
Static pressure test (contractor & Rater verification)	\$25
Refrigerant charge test (contractor verification)	\$25
Filling out the contractor checklist with collected information	\$25
Verification of register location	\$15 \$0
HVAC control verification (i.e., heating, cooling, and fan mode)	\$5 \$0
Bedroom pressure balancing features & verification	\$200
Verification of ventilation system, exhaust fans, & filter	\$50
Sound check for intermittent bath exhaust fans	\$5 \$0



Rev 08 Preview:

- Streamlined HVAC verification tasks



Phase 3: Final Inspection

Measure	Cost
Duct blaster	\$0
Blower door	\$0
Static pressure test (contractor & Rater verification)	\$25
Refrigerant charge test (contractor verification)	\$25
Filling out the contractor checklist with collected information	\$25
Bedroom pressure balancing features & verification	\$200
Verification of ventilation system, exhaust fans, & filter	\$50
Completion and collection of Water Management System checklist	\$25 \$0

Rev 08 Preview:

- Water Management System requirements maintained, but paperwork eliminated



Phase 3: Final Inspection

Measure	Cost
Duct blaster	\$0
Blower door	\$0
Static pressure test (contractor & Rater verification)	\$25
Refrigerant charge test (contractor verification)	\$25
Filling out the contractor checklist with collected information	\$25
Bedroom pressure balancing features & verification	\$200
Verification of ventilation system, exhaust fans, & filter	\$50
Total	\$325



Summary

Measure	Cost
Phase 1: Plan Review	(\$175) - \$150
Phase 2: Pre-Drywall	(\$50 – 100)
Phase 3: Final	\$325
Total	\$50 - 425

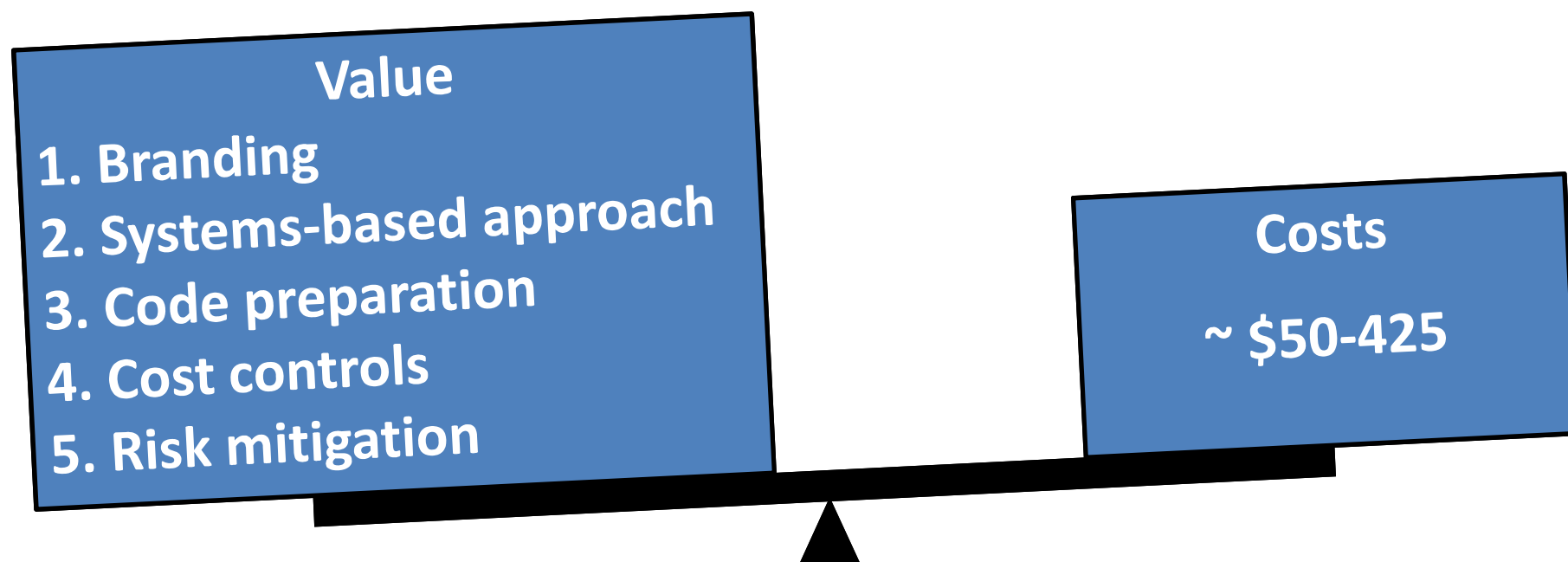


Summary

Task Removed in Revision 08	Cost
Collecting Manual J/S	Priceless
Collecting AHRI Certificates	Priceless
Collecting Test & Balance Report	Priceless
Comparing/Counting Registers	Priceless
Airflow Measurements at All Registers	Priceless
Performing Refrigerant Charge Math	Priceless
Collecting Commissioning Reports	Priceless
Collecting Water Management System Checklist	\$25



Summary





ENERGY STAR Certified Homes

Web:

Main: www.energystar.gov/newhomespartners
Technical: www.energystar.gov/newhomesguidelines
Training: www.energystar.gov/newhomestraining
HVAC: www.energystar.gov/newhomesHVAC

Email:

energystarhomes@energystar.gov

Social Media:



@energystarhomes



facebook.com/energystar

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