

ENERGY STAR® New Construction

Northwest Regional

Program Requirements

Historically, regional program requirements were used to certify homes and apartments in Idaho, Montana, Oregon, and Washington. Specifically, in these states, the Northwest ENERGY STAR Program Requirements for Single-Family Homes were used to certify homes permitted prior to January 1, 2016, and the Northwest ENERGY STAR Homes Program Requirements for Multifamily Dwellings were used to certify multifamily dwelling units permitted before January 1, 2017. These program requirements and additional resources have been compiled below.

For the most current program requirements, visit www.energystar.gov/newhomesrequirements. Contact energystarhomes@energystar.gov if you have any questions.

September 2025



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Implementation Timeline for Single-Family Program Requirements in Northwest States

The table below lists the ENERGY STAR Single-Family New Homes (SFNH) program requirements applicable to homes in Northwest states during the period of 2016-2019 when the regional Northwest program requirements were being phased out.

State	Version of Program Requirements	Applicable to Homes with the Following Permit Date
ID	SFNH National Version 3	On or After 01/01/2016
MT	SFNH National Version 3.1	On or After 01/01/2016
OR	SFNH National Version 3.1 SFNH OR and WA Version 3.2	01/01/2016 to 03/31/2019 On or After 04/01/2019
WA	SFNH National Version 3.1 SFNH OR and WA Version 3.2	01/01/2016 to 06/30/2018 On or After 07/01/2018

Historical program requirement documents referenced above can be found in the [Archives](#).

Northwest Program Requirements For Single-Family Homes

These regional program requirements were used to certify single-family homes in the Northwest.



Northwest ENERGY STAR® Single-Family Homes Requirements

Updated: July 1, 2015

Single-Family
Washington, Oregon,
Idaho, Montana

Effective November 1, 2014, the use of Northwest REM/Rate™ will be the required means for Northwest ENERGY STAR® Homes certification for single-family homes. This document outlines the programmatic and technical requirements for building and qualifying homes for certification, including measures used to establish the Reference Home for your state.

Qualifying Homes

In Washington, Oregon, Idaho and Montana, the following homes are eligible for Northwest ENERGY STAR Homes certification:

- Detached dwelling units¹ (e.g., single-family homes) **OR**
- Dwelling units in any townhome building with four units or less

Note that compliance with these guidelines is not intended to imply compliance with all local code requirements that may be applicable to the home.²

Northwest ENERGY STAR Compliance Requirements

Modeling in Northwest REM/Rate™ provides flexibility to select a custom combination of measures for each home that is equivalent in performance to the minimum requirements of the Northwest ENERGY STAR Reference Home for your state, listed in Exhibit 1. Equivalent performance is assessed through energy modeling.

Follow the steps below:

1. Using the Northwest REM/Rate™ software program, configure the preferred set of energy measures for the rated home according to the program requirements³ and limitations set forth in the Modeling Guidelines for Northwest REM/Rate™. Regardless of the measures selected, all homes must meet the mandatory requirements listed in Exhibit 2. Note that the Rater Field Checklist requires that all insulation, windows, doors and skylights meet or exceed 2009 IECC requirements.^{4,5,6,7}
2. Verify that the resulting annual energy consumption is less than or equal to that of the Reference Home. This can be verified with the Northwest ENERGY STAR Homes Compliance Report.
 - The Compliance Report generates annual energy consumption in MMBtu/yr for heating, cooling, water heating and lights/appliances, and flags errors or non-compliance issues.
 - A home may also be constructed prescriptively according to all of the building measures listed for the appropriate Reference Home, as outlined in Exhibit 1, and qualify for certification. The listed building measures are considered minimums; no trade-offs below the building measures are available if choosing this path.
 - i. All other requirements listed in this document must still be met, including producing a Northwest REM/Rate™ .blg file.
 - ii. If your state code requires additional energy credits for homes exceeding a certain conditioned floor area,⁸ building prescriptively to the Reference Home is not an acceptable means of qualifying for certification. Certification of these projects is dependent upon results of the Compliance Report.
 - iii. If the same floor plan is used to construct multiple homes, only one .blg file must be created. The Rater may re-use this .blg file for all subsequent homes rather than creating a new one each time from scratch. This allowance will be made providing RESNET procedures for worst case analysis are used. (http://www.resnet.us/about/worst-case_analysis.pdf)
 - If the resulting total annual energy consumption is less than or equal to that of the Reference Home, proceed to step 3. If not, reconfigure the energy measures for the rated home. The Rater can view a comparison of each detailed input between the Rated home and the Reference Home by running a Building File Report in Northwest REM/Rate™.
3. Construct the home according to the measures selected in Step 1 and the Checklists outlined in Exhibit 2
4. The Rater⁹ shall verify that the home meets all aforementioned requirements, as well as:
 - On-Site Minimum Rated Features for duct leakage,¹⁰ heat pump efficiencies,^{11,12} ventilation strategy,^{13,14,15} water fixtures,¹⁶ slab insulation, infiltration rate¹⁹, built-in appliances, programmable thermostats,²¹ and hot water pipe insulation specified on the state-specific Reference Home (Exhibit 1); **AND**
 - Northwest REM/Rate™ Modeling Guidelines; **AND**
 - Revision 8 Checklists



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Exhibit 1: Northwest ENERGY STAR Reference Homes

Exhibit 1 displays the measures used to construct the state-specific Reference Homes (used to model target energy consumption). Only the items listed in step 4 above are considered on-site minimum specifications. The Reference Home measures will be adjusted and updated as new energy codes are adopted. While the table below will be updated periodically, Raters will have real-time access to the current Reference Homes by running a Building File Report in Northwest REM/Rate™.

Building Measures	Reference Home Oregon Requirements (NG Furnaces and Electric HPs)	Reference Home Washington Requirements (NG Furnaces and Electric HPs)	Reference Home Montana and Idaho Requirements (NG Furnaces and Electric HPs)
Furnace	≥ 92 AFUE	≥ 95 AFUE	≥ 90 AFUE
Heat pump ¹¹	8.5 HSPF (9 climate zone 5) / 14.5 SEER / 12 EER	9.0 HSPF / 14.5 SEER / 12 EER	9.0 HSPF / 14.5 SEER / 12 EER
AC	≥ 13 SEER	≥ 13 SEER	≥ 13 SEER
NG water heater	0.61 EF gas tank	0.62 EF gas tank	0.61 EF gas tank
Electric water heater ¹⁸	.93 EF electric storage tank	.93 EF electric storage tank	.93 EF electric storage tank
Lighting - CFL	≥ 80%	≥ 90%	≥ 80%
Spot and whole-house exhaust fans ^{13, 15}	Reference Home assumes exhaust fan for whole-house ventilation, high efficacy (2.857 CFM/Watt)	Reference Home assumes exhaust fan for whole-house ventilation, high efficacy (2.857 CFM/Watt)	Reference Home assumes exhaust fan for whole-house ventilation, high efficacy (2.857 CFM/Watt)
Walls ²	U ≤ .051	U ≤ .051	U ≤ .051
Below grade wall	R-19	R-19	R-19
Flat ceilings	R-49 with ≥ R-21 at edge	R-49 with ≥ R-21 at edge	R-38 (R-49 in climate zone 6) with ≥ R-21 at edge
Scissor truss vault	R-38	R-38	R-38
Rafter vault	R-30	R-30	R-30
Floors	R-30	R-38	R-30
Slab	R-10 full+R-15 per.+R-15 break	R-10 full+R-5 break	MT: R-10, 4 ft/R-15 heated slab ID: R-10, 2 ft per
Infiltration rate ^{19, 20}	4 ACH@50	3 ACH@50	4 ACH@50
Duct leakage ¹⁰	Leakage to outside = (.015 x conditioned floor area)	Leakage to outside = (.015 x conditioned floor area)	Leakage to outside = (.045 x conditioned floor area)
Duct location ²⁰	Conditioned space	Conditioned space	Matches design home
Windows	≤ 0.30 U value	≤ 0.28 U value	≤ 0.30 U value
Skylights	≤ 0.50 U value	≤ 0.50 U value	≤ 0.50 U value
Glazing percentage ²⁰	≤ 21%	≤ 21%	≤ 15%
Doors	≥ R-5	≥ R-5	≥ R-5
Water Fixtures ¹⁶	1.75 gpm showerheads 1.5 gpm kitchen faucet 1.0 gpm bathroom faucets	EPA WaterSense models	1.75 gpm showerheads 1.5 gpm kitchen faucet 1.0 gpm bathroom faucets
Appliances	Built-in appliances ENERGY STAR qualified	Built-in appliances ENERGY STAR qualified	Built-in appliances ENERGY STAR qualified
Programmable thermostats ²¹	Required	Required	Required
Hot water pipe insulation	R-4, pipes in unconditioned spaces only	R-4, all pipes	R-4, pipes in unconditioned spaces only



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Exhibit 2: Mandatory Requirements for All Qualified Homes

Design Phase	Build Phase
HVAC Designer <ul style="list-style-type: none"> Completes one HVAC Design Report per system design. 	HVAC Contractor <ul style="list-style-type: none"> Completes HVAC Commissioning Checklist once per system installed (HVAC contractor must keep on file in case Rater requests it).
Rater <ul style="list-style-type: none"> Collects HVAC Design report once per system design. Completes Rater Design Review Checklist once per system design. 	Builder <ul style="list-style-type: none"> Ensures that Water Management System Builder Requirements are met for each home. No per-home documentation required.
	Rater <ul style="list-style-type: none"> Completes Rater Field Checklist once per home.

Partnership, Training and Credentialing Requirements

Prior to home qualification, builders, Raters, HVAC contractors and performance testers must become Northwest ENERGY STAR Partners by satisfying all training requirements detailed at <http://www.northwestenergystar.com/partners/join-program>.

Footnotes

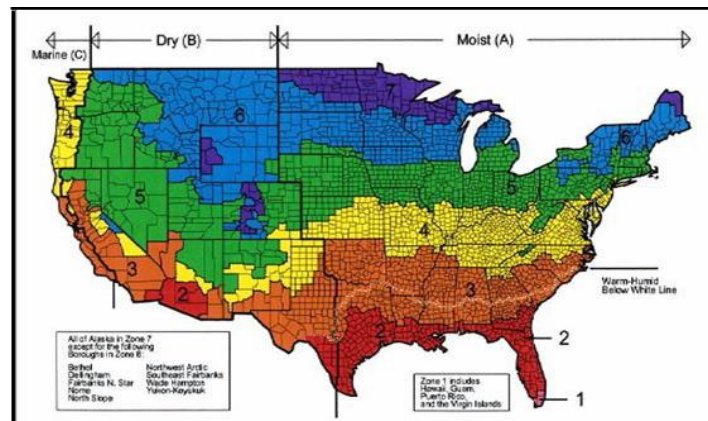
- A dwelling unit, as defined by the 2009 IECC, is a single unit that provides complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.
- Where requirements of the local codes, manufacturers' installation instructions, engineering documents or regional ENERGY STAR programs overlap with the requirements of these guidelines, the EPA offers the following guidance:
 - In cases where the overlapping requirements exceed the ENERGY STAR guidelines, these overlapping requirements shall be met;
 - In cases where overlapping requirements conflict with a requirement of these ENERGY STAR guidelines (e.g., slab insulation is prohibited to allow visual access for termite inspections), then the conflicting requirement within these guidelines shall not be met. Qualification shall only be allowed if the Rater has determined that no equivalent option is available that could meet the intent of the conflicting requirement of these ENERGY STAR guidelines (e.g., switching from exterior to interior slab edge insulation). Note that under the Performance Path, a home must still meet its Annual Energy Use Target. Therefore, other efficiency measures may be needed to compensate for the omission of the conflicting requirement.
- Program requirements are defined as items listed in the Northwest ENERGY STAR Single-Family Homes Requirements document, Modeling Guidelines for Northwest REM/Rate™ document, Revision 8 Checklists, PTCS requirements, and RESNET requirements.
- Insulation levels in a home shall meet or exceed those specified in the state energy code. Note that the U-factor for steel-frame envelope assemblies shall be calculated using the ASHRAE zone method, reduction of ceiling insulation in space-constrained roof/ceiling assemblies shall be limited to 500 ft² or 20% of the ceiling area, whichever is less. Slab insulation is required for slab floors with a floor surface less than 24 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. Slab insulation must meet the requirements of the Northwest ENERGY STAR Homes Reference Home and the Rater Field Checklist.
- Insulation shall be verified by a Rater/Rating Field Inspector to achieve a Grade I installation as defined in the RESNET Standards for ceilings and walls. Floor insulation must be installed to manufacturer's specifications. For ceiling, wall and floor assemblies with continuous rigid insulated sheathing, a Grade II installation is acceptable for the cavity insulation only if the rigid insulation sheathing meets or exceeds the following levels: R-3 in Climate Zones 1 to 4; R-5 in Zones 5 to 8. Note that insulation can be verified by a Field Inspector as long as they are working under the supervision of a Rater.

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6. All windows, doors and skylights shall meet or exceed the component U-factor and SHGC requirements specified in the 2009 IECC – Table 402.1.1. If no NFRC rating is noted on the window or in product literature (e.g., for site-built fenestration), select the U-factor and SHGC value from Tables 4 and 14, respectively, in 2005 ASHRAE Fundamentals, Chapter 31. Select the highest U-factor and SHGC value among the values listed for the known window characteristics (e.g., frame type, number of panes, glass color and presence of low-e coating). Note that the U-factor requirement applies to all fenestration, while the SHGC only applies to the glazed portion. The following exceptions apply:
- An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements;
 - An area-weighted average of fenestration products more than 50% glazed shall be permitted to satisfy the SHGC requirements;
 - 15 square feet of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using a) and b), above;
 - One side-hinged opaque door assembly, up to 24 square feet in area, shall be exempt from the U-factor requirements and shall be excluded from area-weighted averages calculated using a) and b), above;
 - Fenestration utilized as part of a passive solar design shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using a) and b), above. Exempt windows shall be facing within 45 degrees of true South and directly coupled to thermal storage mass that has a heat capacity > 20 btu / ft3xOF and provided in a ratio of at least 3 sq. ft. per sq. ft. of south-facing fenestration. Generally, thermal mass materials will be at least 2 in. thick.
7. The following map depicts Climate Zone boundaries based on 2009 IECC Figure 301.1. It is for illustrative purposes only.



8. Washington State Energy Code requires additional energy credits for homes depending on size. Homes in Washington with CFA in excess of 5000 square feet are not eligible for certification by building prescriptively to the Reference Home.
9. The term 'Rater' refers to the person completing the third-party inspections, modeling the home using NW REM/Rate™ and the procedures detailed above, and submitting the .blg file to a Northwest Rating Provider for certification. The Rater must be a Northwest ENERGY STAR Partner as per the training requirements detailed at www.northwestenergystar.com/partners/join-program and be certified by RESNET.
10. Certification of a duct system under the Northwest ENERGY STAR Homes program is consistent with the EPA's ENERGY STAR Homes specification. The specification may also be found on the Rater Field Checklist.

Each system requires testing. The measured duct leakage to outdoors CFM25 shall not exceed 0.04 x floor area served by the system (in square feet) or 40 CFM25, whichever is greater, and the factory-supplied air handler shall be in place at the time of the test. The following exceptions exist:

- If both the ducts and equipment are located within the conditioned space, the system is exempted from the duct-testing requirement. Up to five percent (5%) of the linear feet of the duct system may be located outside the thermal and/or air barriers of the house, or in exterior cavities of the house.
- If the air handler is located completely within conditioned space, it is not required to be in place during the test.
- If the air handler is located in unconditioned space, it is not required to be in place during the test. However, the leakage limit shall be decreased to 0.03 x floor area served by the system (in square feet) or 35 CFM25, whichever is greater.
- If the ducts are located outside of the conditioned space, all boots and registers must be sealed to the air barrier or finished surface.
- If a total leakage test performed at rough inspection passes the leakage to outside requirements, a duct test at final is not required.
- For instances where State Energy (or Residential/Building) Code require more stringent targets be met or allow for fewer exceptions, the State Code shall be followed.



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In cases where Northwest utility incentives (whole-house or HVAC-specific incentives) are provided, systems must align with Performance Tested Comfort Systems® (PTCS®) specifications. A PTCS-certified technician shall complete the testing and certification process and shall provide documentation of the test results showing compliance to the Rater. Each system requires testing and the measured CFM50 shall not exceed 0.06 x floor area served by the system (in square feet) or 75 CFM50, whichever is greater, and the factory-supplied air handler shall be in place at the time of the test. The following exceptions exist:

- If both the ducts and equipment are located within the conditioned space, the system is exempted from the duct-testing requirement. Up to five percent (5%) of the linear feet of the duct system may be located outside the thermal and/or air barriers of the house, or in exterior cavities of the house.
 - If the air handler is located completely within conditioned space, it is not required to be in place during the test.
 - If the air handler is located in unconditioned space, it is not required to be in place during the test. However, the leakage limit shall be decreased to 0.04 x floor area served by the system (in square feet) or 50 CFM50, whichever is greater.
11. The efficiency for air source heat pumps in Climate Zones 4, 5 and 6 shall exceed the ENERGY STAR minimum of 8.0 HSPF.
12. A mini-split heat pump system's rated heating capacity shall meet or exceed the minimum heating size (output) as specified below (depending on the climate of the installation).
- Coastal zones west of the Cascades (Zone 4), 6 Btu/h/ft² of heated floor area;
 - Intermountain zones of eastern Washington, Oregon, and southwestern Idaho with less than 7000 heating degree days (Zone 5), 8 Btu/h/ft² of heated floor area;
 - Mountain zones of eastern Idaho and western Montana with more than 7000 heating degree days (Zone 6), 10 BTU/h/ft² of heated floor area

In addition to the mini-split heat pump system, the home may include supplemental electric unit heaters or zone heaters. Electric unit or zonal heat sources complying with this specification shall have a total capacity NOT to exceed the amounts specified below (depending on the climate of the installation):

- Coastal zones west of the Cascades (Zone 4), ≤ 3 W/ ft² of heated floor area;
- Intermountain zones of eastern Washington, Oregon and southwestern Idaho with less than 7000 heating degree days (Zone 5), ≤ 4 W/ ft² of heated floor area;
- Mountain zones of eastern Idaho and western Montana with more than 7000 heating degree days (Zone 6), ≤ 5 W/ ft² of heated floor area.

Each room in which the heaters are located shall have a thermostat capable of controlling the room heaters separately from other zones in the house.

13. Commissioning is required when a whole-house exhaust fan is used:
- Using a flow hood or similar method that accurately measures airflow, verify that the minimum airflow is met by the exhaust fan.
 - An exhaust fan rated for continuous operation with a sone rating of 1.0 or less located in a central location providing an airflow rate meeting ASHRAE 62.2 2010 requirements must be provided and must run continuously. Alternatively, programmable timer controls may be installed to operate an exhaust fan with a sone rating of 2.0 or less intermittently on a schedule that provides the specified ventilation rates required by ASHRAE 62.2 2010.
14. Air-to-air HRV/ERV installations shall:
- Include documentation that units are installed according to manufacturer's instructions.
 - Include a fully ducted (both supply and exhaust) ventilation system with both exhaust and supply airflow. A minimum rating of 60% sensible heat recovery efficiency is required with the unit operating in its installed fan speed mode at 32 deg. F. Units shall be third-party tested in accordance with C439-06.
 - Be sized and set to operate in accordance to ASHRAE Std 62.2 2010.
 - Have a minimum fan efficacy of 1.33 cfm/W measured at the most typical operational flow rate.
 - Supply air to at least one central location in the home or the return side of the home's central duct system. For maximum effectiveness, the system should supply air to individual bedrooms as well as other general living spaces.
 - Have an easily accessible filter. When such filter is not integral to the HRV/ERV, filters should be installed on the upstream side of the heat exchanger in the intake airstream.
 - Provide protection against ice buildup that does not disable the unit during freezing weather.

Connections to the HRV/ERV shall be made with flexible connectors to reduce vibration. Ductwork shall be located within the conditioned envelope to the maximum extent possible. All ductwork located outside the conditioned building envelope, or between the outside wall and the HRV/ERV, shall also be fully insulated to R-8 minimum. All ducting should be adequately supported and sealed. Duct testing is not required unless ventilation ducts are conjoined with space conditioning ducts.

15. All exhaust fans, both spot and whole-house ventilation, shall be high efficacy (2.857 cfm/watt) fans, except in kitchens and half bathrooms and must be rated at ≤1.0 sones when set to run continuously, ≤2.0 sones when set to run intermittently. A half bathroom is any bathroom that does not contain a bathtub, shower, spa or similar source of moisture. Additional exhaust fans that are not ENERGY STAR qualified must meet the efficacy requirement of 1.4 cfm/w.
16. Faucets and showerheads should be installed as follows: 1.75 gpm showerheads, 1.5 gpm kitchen faucet, 1.0 gpm bathroom faucet. Faucet aerators are permitted. An exception to 1.0 gpm faucets in bathrooms: 1.5 gpm faucets may be used if showerheads are 1.5 gpm or below. In Washington, any EPA WaterSense labeled products are acceptable.



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17. The Rater may define the 'permit date' as either the date that the permit was issued or the date of the contract on the home. In cases where permit or contract dates are not available, Providers have discretion to estimate permit dates based on other construction schedule factors. These assumptions should be both defensible and documented.
18. Domestic hot water systems that are integrated with the space-heating system are permitted to be used in the following two scenarios:
 - Either the space-heating system (e.g., furnace or boiler) shall heat and circulate a fluid through an indirect storage tank, OR a single integrated/combined product intended for both space heating and domestic hot water shall be used. A "tankless coil water heater," where domestic water flows through a coil installed in the space-heating system, is not permitted.
 - Heat pump water heaters shall not be installed inside the thermal and pressure boundary of the home unless both intake and exhaust air is ducted directly to the outside according to manufacturer's specifications. Heat pump water heaters used to meet this requirement must be selected from NEEA's Qualified Products List (<http://neea.org/docs/northern-climate-heat-pump-water-heater-specification/qualified-products-list.pdf?sfvrsn=6>) and installed using the recommendations set forth in the Smart Water Heat Best Practices Installation Guide (http://smartwaterheat.org/sites/default/files/Smart_Water_Heat_Best_Practices_Installation_Guide.pdf).
19. Envelope leakage shall be determined by a Rater/RFI using a RESNET-approved testing protocol. Homes built to the ENERGY STAR specification must meet or beat the target infiltration rate for the state identified in Exhibit 1, with the exception of scenarios where codes mandate the installation of fire suppression systems. In these cases, the Rater and Provider may determine the reasonable infiltration rate that the home shall meet, or add a 0.5 ACH to the state target.
20. Conditioned Floor Area for calculation of window to floor area (WFA), building leakage rates and duct leakage rates shall include conditioned basements. Conditioned basements are defined by Northwest ENERGY STAR Homes as occupiable space located below grade, or partially below grade and is included within the home's thermal and pressure boundary. Conditioned, attached garages shall not be included in the CFA. Up to 15 square feet of "decorative" glazed fenestration per dwelling unit may be exempted from the U-value and SHGC requirements, and shall be excluded from area-weighted average calculations, but shall be included in calculating the total WFA ratio.
21. Programmable thermostat shall be installed unless the thermostat controls a zone with electric radiant heat, for which a manual adjustable thermostat is allowed. Ductless heat pumps are not required to have programmable thermostats.

Addendum: See Water Management System Requirements below.



Water Management System Builder Requirements¹

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

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 Rater).
- 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 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. ²
- 1.2 Back-fill 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 ≥ 1 in. extruded polystyrene insulation with taped joints. ^{3, 4, 5}
- 1.4 Capillary break at all crawlspace floors using ≥ 6 mil polyethylene sheeting, lapped 6-12 in., & installed using one of the following: ^{3, 4, 5}
 - 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. ⁶
 - 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 exterior below-grade walls. ⁷
- 1.7 Sump pump covers 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 pump. If drain tile is on interior side of footing, then channel provided through footing to exterior side. 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. ⁹
- 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 stucco and non-structural masonry cladding wall assemblies. ^{9, 10}
- 2.3 Window and door openings fully flashed. ¹¹

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. ¹²
- 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. See Footnote for alternatives & exemptions. ^{3, 13, 14}
- 3.3 Self-adhering polymer-modified bituminous membrane at all valleys & roof deck penetrations. ^{3, 15}
- 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. ^{3, 15}

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. ¹⁶
- 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. ⁷
- 4.4 Building materials with visible signs of water damage or mold *not* installed or allowed to remain. ¹⁷
- 4.5 Framing members & insulation products having high moisture content *not* enclosed (e.g., with drywall). ¹⁸
- 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.

Footnotes:

1. These requirements are designed to improve moisture control in homes. However, these features alone cannot prevent all moisture problems. For example, leaky pipes or overflowing baths can lead to moisture issues and negatively impact the performance of the home.
2. Swales or drains designed to carry water from foundation are permitted to be provided as an alternative to the slope requirements for any home, and shall be provided for a home where setbacks limit space to less than 10 ft. Also, tamping of back-fill is not required if either: proper drainage can be achieved using non-settling compact soils, as determined by a certified hydrologist, soil scientist, or engineer; OR, the builder has scheduled a site visit to provide in-fill and final grading after settling has occurred (e.g., after the first rainy season).



Water Management System Builder Requirements¹

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

3. Not required in Dry (B) climates as shown in 2009 IECC Figure 301.1 and Table 301.1.
4. Not required for raised pier foundations with no walls. To earn the ENERGY STAR, EPA recommends, but does not require, that radon-resistant features be included in homes built in EPA Radon Zones 1, 2 & 3. For more information, see www.epa.gov/indoorairplus.
5. For an existing slab (e.g., in a home undergoing a gut rehabilitation), in lieu of a capillary break beneath the slab, a continuous and sealed Class I or Class II Vapor Retarder (per Footnote 7) is permitted to be installed on top of the entire slab. In such cases, up to 10% of the slab surface is permitted to be exempted from this requirement (e.g., for sill plates). In addition, for existing slabs in occupiable space, the Vapor Retarder shall be, or shall be protected by, a durable floor surface. If Class I Vapor Retarders are installed, they shall not be installed on the interior side of air permeable insulation or materials prone to moisture damage.
6. Interior surface of an existing below-grade wall (e.g., in a home undergoing a gut rehab.) listed in Item 1.5a is permitted to be finished by:
 - Installing a continuous and sealed drainage plane, capillary break, Class I Vapor Retarder (per Footnote 7) and air barrier that terminates into a foundation drainage system as specified in Item 1.8; OR
 - If a drain tile is not required as specified in Footnote 8, adhering a capillary break and Class I Vapor Retarder (per Footnote 7) directly to the wall with the edges taped/sealed to make it continuous.

Note that no alternative compliance option is provided for existing below-grade wood-framed walls in Item 1.5b.

7. The 2009 IRC defines Class I vapor retarders as a material or assembly with a rating of ≤ 0.1 perm, using the desiccant method with Proc. A of ASTM E 96. The following materials are typically ≤ 0.1 perm and shall not be used on the interior side of air permeable insulation in above-grade exterior walls in warm-humid climates or below-grade exterior walls in any climate: rubber membranes, polyethylene film, glass, aluminum foil, sheet metal, and foil-faced insulating / non-insulating sheathings. These materials can be used on the interior side of walls if air permeable insulation is not present (e.g., foil-faced rigid foam board adjacent to a below-grade concrete foundation wall is permitted).

Note that this list is not comprehensive and other materials with a perm rating ≤ 0.1 also shall not be used. Also, if mfr. spec.'s for a product indicate a perm rating ≥ 0.1 , then it may be used, even if it is in this list. Also note that open-cell and closed-cell foam generally have ratings above this limit and may be used unless mfr. spec.'s indicate a perm rating ≤ 0.1 . Several exemptions to these requirements apply:

 - Class I vapor retarders, such as ceramic tile, may be used at shower and tub walls;
 - Class I vapor retarders, such as mirrors, may be used if mounted with clips or other spacers that allow air to circulate behind them.
8. Alternatively, either a drain tile that is pre-wrapped with a fabric filter or a Composite Foundation Drainage System (CFDS) that has been evaluated by ICC-ES per AC 243 are permitted to be used. Note that the CFDS must include a soil strip drain or another ICC-ES evaluated perimeter drainage system to be eligible for use. In an existing home (e.g. in a home undergoing a gut rehab.) a drain tile installed only on the interior side of the footing without a channel is permitted. Additionally, a drain tile is not required when a certified hydrologist, soil scientist, or engineer has determined that a crawlspace foundation, or an existing basement foundation (e.g., in a home undergoing a gut rehab.), is installed in Group I Soils (i.e. well-drained ground or sand-gravel mixtures), as defined by 2009 IRC Table R405.1.
9. These Items not required for existing structural masonry walls (e.g., in a home undergoing a gut rehabilitation). Note this exemption does not extend to existing wall assemblies with masonry veneers.
10. Any of the following systems may be used: a monolithic weather-resistant barrier (i.e., house wrap) shingled at horizontal joints and sealed or taped at all joints; weather resistant sheathings (e.g., faced rigid insulation) fully taped at all "butt" joints; lapped shingle-style building paper or felts; or other water-resistive barrier recognized by ICC-ES or other accredited agency.
11. Apply pan flashing over the rough sill framing, inclusive of the corners of the sill framing; side flashing that extends over pan flashing; and top flashing that extends over side flashing or equivalent details for structural masonry walls.
12. Intersecting wall siding shall terminate 1 in. above the roof or higher, per manufacturer's recommendations. Continuous flashing shall be installed in place of step flashing for metal and rubber membrane roofs.
13. The assessment of whether the soil is expansive or collapsible shall be completed by a certified hydrologist, soil scientist, or engineer.
14. Any of the following are permitted to be used as alternatives to Item 3.2: a) a roof design that deposits rainwater to a grade-level rock bed with a waterproof liner and a lateral drain pipe that meets discharge requirements per Item 3.2; b) a rainwater harvesting system that drains overflow to meet discharge requirements per Item 3.2; or c) a continuous rubber membrane (e.g. EPDM) that is aligned with the foundation wall from final grade to ≥ 8 in. below grade and then slopes ≥ 0.5 in. per ft. away from the home for at least 5 ft., with Group I Soils (as defined in Footnote 8) covering the membrane to within 3 in. of final grade.
15. As an alternative, any applicable option in 2009 IRC Section R905.2.8.2 is permitted to be used to meet Item 3.3 and any option in 2009 IRC Section R905.2.7.1 is permitted to be used to meet Item 3.4. EPA recommends, but does not require, that products meet ASTM D1970.
16. In addition to cement board, materials that have been evaluated by ICC-ES per AC 115 may also be used to meet this requirement. Monolithic tub and shower enclosures (e.g., fiberglass with no seams) are exempt from this backing material requirement unless required by the manufacturer. Paper-faced backerboard may only be used behind monolithic enclosures or waterproof membranes that have been evaluated by ICC-ES per AC 115, and then only if it meets ASTM mold-resistant standards ASTM D3273 or ASTM D6329.
17. If mold is present, effort should be made to remove all visible signs of mold (e.g., by damp wipe with water and detergent). If removal methods are not effective, then the material shall be replaced. However, stains that remain after damp wipe are acceptable. Lumber with "sap stain fungi" is exempt from this Item as long as the lumber is structurally intact.
18. For wet-applied insulation, follow manufacturer's drying recommendations. EPA recommends that lumber moisture content be $\leq 18\%$.
19. This Revision is required to certify all homes permitted after 07/01/2016, but can be used to certify any home permitted or completed prior to this date. The Rater may define the 'permit date' as either the date that the permit was issued or the date of the contract on the home. In cases where permit or contract dates are not available, Providers have discretion to estimate permit dates based on other construction schedule factors. These assumptions should be both defensible and documented.

Northwest Program Requirements For Multifamily Dwellings

These regional program requirements were used to certify multifamily dwelling units in the Northwest.



Northwest ENERGY STAR® Homes

Program Requirements¹ for Multifamily Dwellings

(Five or fewer conditioned stories above grade)

NWBOP1 MF
Gas and Heat Pump
Heated Dwellings

This BOP was developed to provide construction guidelines for energy-efficient Multifamily dwellings. Multifamily builders shall use these specifications and complete the Mandatory Requirements for all Qualified Homes, listed in Exhibit 2. Note that compliance with these guidelines is not intended to imply compliance with all local code¹ requirements that may be applicable to the building to be built.

Exhibit 1: Northwest ENERGY STAR Homes BOP1 - Consistent Elements for All Dwellings

Heating & Cooling Equipment									
<ul style="list-style-type: none"> ▪ Heating equipment shall meet the following efficiency levels: <ul style="list-style-type: none"> ○ ≥ 85 AFUE gas furnace, boiler or unit heater ○ ≥ 8.5 HSPF / 14 SEER / 12 EER / 2.5 COP air-source, package terminal or mini-split heat pump ▪ Cooling-only equipment shall meet the following efficiency level: <ul style="list-style-type: none"> ○ ≥ 13 SEER 									
Envelope, Windows & Doors ²									
Walls:									
Climate Zone 4	Above Grade: ≥ R-21 Intermediate framed AND achieve Grade I installation per RESNET standards								
	Below Grade: ≥ R-21 Intermediate framed AND achieve Grade I installation per RESNET standards								
Climate Zones 5 & 6	Above Grade: ≥ R-21 + R-5 exterior Intermediate framed AND achieve Grade II installation per RESNET standards								
	Below Grade: ≥ R-21 + R-5 exterior Intermediate framed AND achieve Grade II installation per RESNET standards								
Ceiling:	≥ R-60 with ≥ R-21 at ceiling edge								
Framed Floor:	≥ R-38								
Slab:	≥ R-15 2' perimeter insulation with minimum R-5 thermal break. Insulation must extend from the top of slab for a total distance ≥ 2ft. vertical, horizontal, or combined								
Infiltration:	≤ 4 ACH@50 ³								
Windows:	≤ 0.30 U-Value ^{4, 5, 6}								
Skylights:	≤ 0.40 U-Value								
Doors:	R-5, One door up to 28 sq. ft. exempt								
Buildings with total window-to-floor area (WFA) greater than 21% shall have adjusted U-Values as outlined in Footnote 5									
Water Heating									
DHW equipment shall meet the following efficiency requirements:									
Plumbing: All hot water pipes must be insulated to ≥ R-4, regardless of location									
Natural Gas	0.61	Gas commercial tank water heaters may be used if they have standby losses that do not exceed the following (Btu/hr):							
		Gallons	70-74	75-79	80-84	85-89	90-94	95-99	100+
Electric ⁷	0.93	Max Standby Losses	930	960	980	1010	1030	1060	1080
Ventilation, Thermostat & Ductwork									
<ul style="list-style-type: none"> ▪ All ducts in unconditioned space shall have insulation ≥ R-8 ▪ For heating and cooling systems with ductwork outside the conditioned envelope, total duct leakage shall be ≤ 0.06 CFM50 per sq. ft. of conditioned floor area or ≤ 75 CFM50, whichever is greater⁸ ▪ Exhaust fans in Full Bathrooms must be ENERGY STAR qualified⁹ ▪ Mechanical ventilation systems installed to meet Whole-house ventilation requirements must be designed and installed in accordance with local code OR ASHRAE Standard 62.2-2010, whichever is more stringent; AND must also be ENERGY STAR qualified Exhaust⁹ OR HRV¹⁰. The measured ventilation rate for dwelling units and common areas shall not exceed 150% of the ASHRAE or code minimum. 									



Northwest ENERGY STAR® Homes Program Requirements¹ for Multifamily Dwellings (Five or fewer conditioned stories above grade)

NWBOP1 MF
Gas and Heat Pump
Heated Dwellings

Lighting, Appliances & Fixtures

- All builder-installed appliances shall be ENERGY STAR qualified
- ENERGY STAR qualified CFLs or pin-based lighting in 90% of fixtures¹¹, **OR** use any efficient light source and lighting design to reach 0.59 Watts per square foot, while meeting the requirements outlined in Footnote 12
- Low-flow fixtures: 1.75 gpm showerheads

Qualifying Dwellings

The following types of Multifamily dwellings in WA, OR, ID and MT are eligible for certification under Northwest ENERGY STAR Homes:

- Dwelling units in any townhome¹³ building with 5 units or more; **OR**
- Dwelling units in Multifamily buildings with 3 stories or fewer above-grade; **OR**
- Dwelling units in Multifamily buildings with 4 or 5 stories above-grade, where dwelling units occupy 80% or more of the occupiable square footage of the building. When evaluating mixed-use buildings for eligibility, exclude commercial /retail space when assessing whether 80% threshold has been met; **AND**
 - Dwelling units in Multifamily buildings with 4 or 5 stories above-grade, where building is wood framed on residential stories or utilizes continuous insulation strategies such as SIPs, ICFs or similar; **AND**
 - Dwelling units in Multifamily buildings with 4 or 5 stories above-grade, where units use individual or “bundled” space and water heating strategies as defined by the following characteristics:
 - Rater/Rating Field Inspector¹⁴ must be able to physically access the equipment
 - Equipment must not be centrally sourced
 - Equipment must be designed for residential, not commercial application
- Dwelling units in Multifamily buildings that are not eligible for certification under Northwest ENERGY STAR Homes may be eligible through the EPA’s ENERGY STAR Multifamily High Rise Program.

Mandatory Requirements for All ENERGY STAR Qualified Homes

All ENERGY STAR Qualified Multifamily buildings must meet the requirements of the checklists in Exhibit 2.

Exhibit 2: Mandatory Requirements for All Qualified Homes

Design Phase	Build Phase
HVAC Designer <ul style="list-style-type: none"> ▪ Completes one HVAC Design Report per system design. 	HVAC Contractor <ul style="list-style-type: none"> ▪ Completes HVAC Commissioning Checklist once per system installed (HVAC contractor must keep on file in case Rater requests it).
Rater <ul style="list-style-type: none"> ▪ Collects HVAC Design report once per system design. ▪ Completes Rater Design Review Checklist once per system design. 	Builder <ul style="list-style-type: none"> ▪ Ensures that Water Management System Builder Requirements are met for each building. ▪ No per-home documentation required.
	Rater <ul style="list-style-type: none"> ▪ Completes Rater Field Checklist once per floor.

Effective Date

Any Multifamily home initiated in the database after 1/1/2014 shall use this version of the guidelines to qualify for Northwest ENERGY STAR Home certification.



Northwest ENERGY STAR® Homes Notes

Footnotes

1. Where requirements of the local codes, manufacturers' installation instructions, engineering documents, overlap with the requirements of these guidelines, the Northwest and national ENERGY STAR programs offer the following guidance:
 - In cases where the overlapping requirements exceed the ENERGY STAR guidelines, the more stringent requirements shall be met;
 - In cases where overlapping requirements conflict with a requirement of these ENERGY STAR guidelines (e.g., slab insulation is prohibited to allow visual access for termite inspections), then the conflicting requirement within these guidelines shall not be met. Certification shall only be allowed if the Rater has determined that no equivalent option is available that could meet the intent of the conflicting requirement of these ENERGY STAR guidelines (e.g., switching from exterior to interior slab edge insulation).
2. Insulation levels in a unit or building shall meet or exceed those specified in the relevant state energy code. Note that the U-factor for steel-frame envelope assemblies shall be calculated using the ASHRAE zone method or Washington State Energy Code Table 10-5A. Additionally, reduction of ceiling insulation in space-constrained roof/ceiling assemblies shall be limited to 500 ft² or 20% of ceiling area, whichever is less. Finally, slab insulation shall extend to the top of the slab to provide a complete thermal break.

Insulation shall be verified by a Rater, Rating Field Inspector, or Building Performance Specialist to achieve Grade I installation as defined in the RESNET Standards, except for wall framing systems with rigid insulation sheathing. For such homes, Grade II installation is acceptable for the cavity insulation.
3. Compliance with this requirement shall be determined according to the following means:
 - By meeting minimum ventilation requirements and providing a completed Rater Field Checklist per floor on stacked units and per unit on townhomes, Multifamily projects meet the adopted specifications to qualify for Northwest ENERGY STAR Homes certification.
 - In areas where the authority having jurisdiction requires testing to a published standard or methodology, this requirement shall be met in accordance with code accepted standards and methodologies.
 - RESNET, EPA and Northwest ENERGY STAR Homes recommend unit by unit testing, as opposed to whole building testing, with a target of 0.22 CFM@50 per sq. ft. of surface area (Minneapolis Leakage Ratio) **OR**
 - Where no such methodology or targets are provided, the following will be considered acceptable by Northwest ENERGY STAR Homes:
 - ENERGY STAR Multifamily High Rise testing standards
 - ASHRAE 62.2 2013 testing on a 15% sample of each dwelling unit type and floor plan
 - LEED NC Environmental Tobacco Smoke Control testing on a 15% sample of each dwelling unit type and floor plan
 - In the event that local codes require whole building testing, follow whole building leakage testing in accordance with protocols published by Retrotec or The Energy Conservatory Where infiltration testing is not required by code, this standard may be assumed to be met through verified compliance with the Rater Field Checklist and ventilation system requirements.
4. All windows, doors, and skylights shall meet ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows except fenestration utilized as part of a passive solar design. These windows shall be facing within 45 degrees of true south and directly coupled to thermal storage mass that has a heat capacity > 20 btu per ft³ per 1°F and provided in a ratio of at least 3 sq. ft. per sq. ft. of south facing fenestration. Generally, thermal mass materials will be at least 2" thick. Also, note that the U-Value and SHGC for doors apply to the whole door, not just to the glazing portion. The following exceptions apply:
 - a. An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements;
 - b. An area-weighted average of fenestration products more than 50% glazed shall be permitted to satisfy the SHGC requirements;
 - c. 15 square feet of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using (a.) and (b.), above;
 - d. One side-hinged opaque door assembly up to 24 square feet in area shall be exempt from the U-factor requirements and shall be excluded from area-weighted averages calculated using (a.) and (b.) above;
5. All decorative glass and skylight window areas count toward the total window area to above-grade conditioned floor area (WFA) ratio. For homes using the Prescriptive Path that have a WFA ratio >15%, an improved window U-Value is required and is determined by:



Northwest ENERGY STAR® Homes Notes

$$\text{Improved U-Value} = [0.15 / \text{WFA}] \times [\text{ENERGY STAR U-Value}]$$

Where the ENERGY STAR U-Value is the maximum allowable U-Value in the Northwest ENERGY STAR BOP 1, Exhibit 1. For example, for a building built to the BOP, with a WFA of 18%:

$$\text{Improved U-Value} = [0.15 / 0.18] \times 0.30$$

$$\text{Improved U-Value} = 0.25$$

Conditioned Floor Area for calculation of Window to Floor Area (WFA) shall include conditioned basements. Conditioned basements are defined by Northwest ENERGY STAR Homes as basements with rigid foam insulation or insulation that is installed in a furred out wall assembly and that meet vapor permeability and bulk water protection as defined in the Water Management System Builder Checklist. Attached garages shall not be included in the CFA.

6. Up to 15 square feet of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements.
7. When a heat pump water heater is installed to meet this requirement, please refer to the Northern Climate Specification guidelines at: <http://neea.org/northernclimatespec/>, and NEEA's Heat Pump Water Heater (HPWH) Best Practices Installation Guide at: http://smartwaterheat.org/sites/default/files/Smart_Water_Heat_Best_Practices_Installation_Guide.pdf.
8. Certification of a duct system under the Northwest ENERGY STAR Homes program is consistent with the EPA ENERGY STAR Homes specification. The specification may also be found on the Rater Field Checklist.

Each system requires testing. The measured duct leakage to outdoors CFM25 shall not exceed 0.04 x floor area served by the system (in square feet) or 40 CFM25, whichever is greater. The factory-supplied air handler shall be in place at the time of the test.

The following exceptions exist:

- If both the ducts and equipment are located within the conditioned space, the system is exempted from the duct-testing requirement. Up to five percent (5%) of the linear feet of the duct system may be located outside the thermal and/or air barriers of the house, or in exterior cavities of the house.
- If the air handler is located completely within conditioned space, it is not required to be in place during the test.
- If the air handler is located in unconditioned space, it is not required to be in place during the test. However, the leakage limit shall be decreased to 0.03 x floor area served by the system (in square feet) or 35 CFM25, whichever is greater.
- If the ducts are located outside of the conditioned space, all boots and registers must be sealed to the air barrier or finished surface.
- If a total leakage test performed at rough in passes the leakage to outside requirements, a duct test at final is not required.
- Note, for instances where State Energy (or Residential/Building) Code require more stringent targets be met or allow for fewer exceptions, the State Code shall be followed.

In cases where Northwest utility incentives (whole house or HVAC specific incentives) are provided, systems must align with Performance Tested Comfort Systems® (PTCS®) specifications. A PTCS-certified technician shall complete the testing and certification process and shall provide documentation of the test results showing compliance to the Rater. Each system requires testing and the measured CFM50 shall not exceed 0.06 x floor area served by the system (in square feet) or 75 CFM50, whichever is greater, and the factory-supplied air handler shall be in place at the time of the test. The following exceptions exist:

- If both the ducts and equipment are located within the conditioned space, the system is exempted from the duct-testing requirement. Up to five percent (5%) of the linear feet of the duct system may be located outside the thermal and/or air barriers of the house, or in exterior cavities of the house.
- If the air handler is located completely within conditioned space, it is not required to be in place during the test.
- If the air handler is located in unconditioned space, it is not required to be in place during the test. However, the leakage limit shall be decreased to 0.04 x floor area served by the system (in square feet) or 50 CFM50, whichever is greater.

9. All exhaust fans shall be ENERGY STAR qualified, except in kitchens and half bathrooms. A half bathroom is any bathroom that does not contain a bathtub, shower, spa, or similar source of moisture. Alternatively, exhaust fans that are not ENERGY STAR qualified must meet the efficacy requirement of 1.4 cfm/w and have a sone rating of 3 or less.
10. Air-to-air H/ERV installations shall:
 - Include documentation that units are installed according to manufacturer's instructions
 - Include a fully ducted (both supply and exhaust) ventilation system with both exhaust and supply airflow. A minimum rating of 65% sensible recovery efficiency (SRE) is required with the unit operating in its installed fan speed mode at 32 deg. F. Units shall be third party tested in accordance with C439-06
 - Be sized and set to operate in accordance to ASHRAE Std 62.2
 - A minimum fan efficacy of 1.33 cfm/W measured at the most typical operational flow rate
 - Supply air to at least one central location in the dwelling. For maximum effectiveness, system should supply air to individual bedrooms as well as other general living spaces



Northwest ENERGY STAR® Homes Notes

- Have an easily accessible filter. When such filter is not integral to the H/ERV, filters should be installed on the upstream side of the heat exchanger in the intake airstream
- Provide protection against ice buildup that does not disable the unit during freezing weather

Connections to the H/ERV shall be made with flexible connectors to reduce vibration. Ductwork shall be located within the conditioned envelope to the maximum extent possible. All ductwork located outside the conditioned building envelope, or between the outside wall and the H/ERV, shall also be fully insulated to R-8 minimum. All ducting should be adequately sealed and supported.

11. This requirement applies to RESNET-defined Qualifying Light Fixture Locations. Also note that the ENERGY STAR Advanced Lighting Package (ALP), which requires a minimum of 80% ENERGY STAR qualified hard-wired fixtures and 100% ENERGY STAR qualified ceiling fans, where installed, may also be used to comply with the lighting requirements.
12. When the Watts per square foot strategy is used, please use the Watts per Square Foot Tool (found here: <http://www.northwestenergystar.com/partners/home-verifiers?tid=36&=Apply>) to determine the dwelling's lighting power density. The following guidelines must also be met:
 - Every room in the dwelling must have at least one hardwired light fixture
 - A wattage assumption of 64 must be used for all incandescent lamps
 - There are no wattage assumptions for LED or Xenon lights. Actual wattages must be used
 - Total dwelling square footage includes the garage square footage
 - The Watts per Square Foot Tool must be submitted at time of verification
13. For townhomes, builders may choose to follow the [Northwest ENERGY STAR Single-Family Homes Requirements](#), so long as the following requirements are met:
 - a. By modeling the townhome in Northwest REM/Rate™, the Rater must show that both an end unit and center unit would consume equal to or less energy than units built to the Multifamily BOP; **AND**
 - b. The Provider approves the Rater's model in Northwest REM/Rate
14. The term "Rater/Rating Field Inspector" refers to the person completing the third-party inspections required for certification. This person shall:
 - Be a certified Home Energy Rater, Rating Field Inspector, BOP Inspector, or an equivalent designation as determined by a Verification Oversight organization such as RESNET; **AND**
 - Have attended and successfully completed an EPA-recognized training class. See www.energystar.gov/newhomestraining. Raters who operate under a Sampling Provider are permitted to verify the Minimum Rated Features of the home using the RESNET-approved sampling protocol.



Northwest ENERGY STAR® Homes Program Requirements¹ for Multifamily Dwellings

(Five or fewer conditioned stories above grade)

NWBOP2 MF
Zonal Electrically
Heated dwellings

This BOP was developed to provide construction guidelines for energy-efficient Multifamily dwellings. Multifamily builders shall use these specifications and complete the Mandatory Requirements for all Qualified Homes, listed in Exhibit 2. Note that compliance with these guidelines is not intended to imply compliance with all local code¹ requirements that may be applicable to the building to be built.

Exhibit 1: Northwest ENERGY STAR Homes BOP2 - Consistent Elements for All Dwellings

Heating & Cooling Equipment									
<ul style="list-style-type: none"> ▪ Heating equipment shall meet the following efficiency levels: <ul style="list-style-type: none"> ○ Zonal Electric with HRV² ▪ Cooling-only equipment shall meet the following efficiency level: <ul style="list-style-type: none"> ○ ≥ 13 SEER 									
Envelope, Windows & Doors ³									
Walls:									
Climate Zone 4	Above Grade: ≥ R-21 Intermediate framed AND achieve Grade I installation per RESNET standards								
	Below Grade: ≥ R-21 Intermediate framed AND achieve Grade I installation per RESNET standards								
Climate Zones 5 & 6	Above Grade: ≥ R-21 + R-5 exterior Intermediate framed AND achieve Grade II installation per RESNET standards								
	Below Grade: ≥ R-21 + R-5 exterior Intermediate framed AND achieve Grade II installation per RESNET standards								
Ceiling:	≥ R-60 with ≥ R-21 at ceiling edge								
Framed Floor:	≥ R-38								
Slab:	≥ R-15 2' perimeter insulation with minimum R-5 thermal break. Insulation must extend from the top of slab for a total distance ≥ 2ft. vertical, horizontal or combined								
Infiltration:	≤ 3.5 ACH@50 ⁴								
Windows:	≤ 0.30 U-Value ^{5, 6, 7}								
Skylights:	≤ 0.40 U-Value								
Doors:	R-5, One door up to 28 sq. ft. exempt								
Buildings with total window-to-floor area (WFA) greater than 21% shall have adjusted U-Values as outlined in Footnote 6									
Water Heating ⁸									
DHW equipment shall meet the following efficiency requirements:									
Plumbing: All hot water pipes must be insulated to ≥ R-4, regardless of location									
Natural Gas	0.61	Gas commercial tank water heaters may be used if they have standby losses that do not exceed the following (Btu/hr):							
Electric ⁸	0.93	Gallons	70-74	75-79	80-84	85-89	90-94	95-99	100+
		Max Standby Losses	930	960	980	1010	1030	1060	1080
Ventilation, Thermostat & Ductwork									
<ul style="list-style-type: none"> ▪ Exhaust fans in Full Bathrooms must be ENERGY STAR qualified⁹ ▪ Mechanical ventilation systems installed to meet Whole-house ventilation requirements must be designed and installed in accordance with local code OR ASHRAE Standard 62.2-2010, whichever is more stringent; AND must also be ENERGY STAR qualified Exhaust¹⁰ OR HRV². The measured ventilation rate for dwelling units and common areas shall not exceed 150% of the ASHRAE or code minimum. 									
Lighting, Appliances & Fixtures									
<ul style="list-style-type: none"> ▪ All builder-installed appliances and exhaust fans⁹ shall be ENERGY STAR qualified ▪ ENERGY STAR qualified CFLs or pin-based lighting in 90% of fixtures¹¹, OR use any efficient light source and lighting design to reach 0.59 Watts per square foot, while meeting the requirements outlined in Footnote 12 ▪ Low-flow fixtures: 1.75 gpm showerheads 									



Northwest ENERGY STAR® Homes Program Requirements¹ for Multifamily Dwellings (Five or fewer conditioned stories above grade)

NWBOP2 MF
Zonal Electrically
Heated dwellings

Qualifying Dwellings

The following types of Multifamily dwellings in WA, OR, ID and MT are eligible for certification under Northwest ENERGY STAR Homes:

- Dwelling units in any townhome¹³ building with 5 units or more; **OR**
- Dwelling units in Multifamily buildings with 3 stories or fewer above-grade; **OR**
- Dwelling units in Multifamily buildings with 4 or 5 stories above-grade, where dwelling units occupy 80% or more of the occupiable square footage of the building. When evaluating mixed-use buildings for eligibility, exclude commercial /retail space when assessing whether 80% threshold has been met; **AND**
 - Dwelling units in Multifamily buildings with 4 or 5 stories above-grade, where building is wood framed on residential stories or utilizes continuous insulation strategies such as SIPs, ICFs or similar; **AND**
 - Dwelling units in Multifamily buildings with 4 or 5 stories above-grade, where units use individual or “bundled” space and water heating strategies as defined by the following characteristics:
 - Rater/Rating Field Inspector¹⁴ must be able to physically access the equipment
 - Equipment must not be centrally sourced
 - Equipment must be designed for residential, not commercial application
- Dwelling units in Multifamily buildings that are not eligible for certification under Northwest ENERGY STAR Homes may be eligible through the EPA’s ENERGY STAR Multifamily High Rise Program.

Mandatory Requirements for All ENERGY STAR Qualified Homes

All ENERGY STAR Qualified Multifamily buildings must meet the requirements of the checklists in Exhibit 2.

Exhibit 2: Mandatory Requirements for All Qualified Homes

Design Phase	Build Phase
HVAC Designer <ul style="list-style-type: none"> ▪ Completes one HVAC Design Report per system design. 	HVAC Contractor <ul style="list-style-type: none"> ▪ Completes HVAC Commissioning Checklist once per system installed (HVAC contractor must keep on file in case Rater requests it).
Rater <ul style="list-style-type: none"> ▪ Collects HVAC Design report once per system design. ▪ Completes Rater Design Review Checklist once per system design. 	Builder <ul style="list-style-type: none"> ▪ Ensures that Water Management System Builder Requirements are met for each building. ▪ No per-home documentation required.
	Rater <ul style="list-style-type: none"> ▪ Completes Rater Field Checklist once per floor.

Effective Date

Any Multifamily home initiated in the database after 1/1/2014 shall use this version of the guidelines to qualify for Northwest ENERGY STAR Home certification.

Footnotes

1. Where requirements of the local codes, manufacturers’ installation instructions, engineering documents, overlap with the requirements of these guidelines, the Northwest and national ENERGY STAR programs offer the following guidance:
 - In cases where the overlapping requirements exceed the ENERGY STAR guidelines, the more stringent requirements shall be met;
 - In cases where overlapping requirements conflict with a requirement of these ENERGY STAR guidelines (e.g., slab insulation is prohibited to allow visual access for termite inspections), then the conflicting requirement within these guidelines shall not be met. Certification shall only be allowed if the Rater has determined that no equivalent option is available that could meet the intent of the conflicting requirement of these ENERGY STAR guidelines (e.g., switching from exterior to interior slab edge insulation).



Northwest ENERGY STAR® Homes Notes

2. Insulation levels in a unit or building shall meet or exceed those specified in the relevant state energy code. Note that the U-factor for steel-frame envelope assemblies shall be calculated using the ASHRAE zone method or Washington State Energy Code Table 10-5A. Additionally, reduction of ceiling insulation in space-constrained roof/ceiling assemblies shall be limited to 500 ft² or 20% of ceiling area, whichever is less. Finally, slab insulation shall extend to the top of the slab to provide a complete thermal break.

Insulation shall be verified by a Rater, Rating Field Inspector, or Building Performance Specialist (BPS) to achieve Grade I installation as defined in the RESNET Standards, except for wall framing systems with rigid insulation sheathing. For such homes, Grade II installation is acceptable for the cavity insulation.

3. Compliance with this requirement shall be determined according to the following means:
- By meeting minimum ventilation requirements and providing a completed Rater Field Checklist per floor on stacked units and per unit on townhomes, Multifamily projects meet the adopted specifications to qualify for Northwest ENERGY STAR Homes certification.
 - In areas where the authority having jurisdiction requires testing to a published standard or methodology, this requirement shall be met in accordance with code accepted standards and methodologies.
 - RESNET, EPA and Northwest ENERGY STAR Homes recommend unit by unit testing, as opposed to whole building testing, with a target of 0.22 CFM@50 per sq. ft. of surface area (Minneapolis Leakage Ratio) **OR**
 - Where no such methodology or targets are provided, the following will be considered acceptable by Northwest ENERGY STAR Homes:
 - ENERGY STAR Multifamily High Rise testing standards
 - ASHRAE 62.2 2013 testing on a 15% sample of each dwelling unit type and floor plan
 - LEED NC Environmental Tobacco Smoke Control testing on a 15% sample of each dwelling unit type and floor plan
 - In the event that local codes require whole building testing, follow whole building leakage testing in accordance with protocols published by Retrotec or The Energy Conservatory Where infiltration testing is not required by code, this standard may be assumed to be met through verified compliance with the Rater Field Checklist and ventilation system requirements.
4. All windows, doors, and skylights shall meet ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows except fenestration utilized as part of a passive solar design. These windows shall be facing within 45 degrees of true south and directly coupled to thermal storage mass that has a heat capacity > 20 btu per ft³ per 1°F and provided in a ratio of at least 3 sq. ft. per sq. ft. of south facing fenestration. Generally, thermal mass materials will be at least 2" thick. Also, note that the U-Value and SHGC for doors apply to the whole door, not just to the glazing portion. The following exceptions apply:
- a. An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements;
 - b. An area-weighted average of fenestration products more than 50% glazed shall be permitted to satisfy the SHGC requirements;
 - c. 15 square feet of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements, and shall be excluded from area-weighted averages calculated using (a.) and (b.), above;
 - d. One side-hinged opaque door assembly up to 24 square feet in area shall be exempt from the U-factor requirements and shall be excluded from area-weighted averages calculated using (a.) and (b.) above;
5. All decorative glass and skylight window areas count toward the total window area to above-grade conditioned floor area (WFA) ratio. For homes using the Prescriptive Path that have a WFA ratio >15%, an improved window U-Value is required and is determined by:

$$\text{Improved U-Value} = [0.15 / \text{WFA}] \times [\text{ENERGY STAR U-Value}]$$

Where the ENERGY STAR U-Value is the maximum allowable U-Value in the Northwest ENERGY STAR BOP 1, Exhibit 1. For example, for a building built to the BOP, with a WFA of 18%:

$$\text{Improved U-Value} = [0.15 / 0.18] \times 0.30$$

$$\text{Improved U-Value} = 0.25$$

Conditioned Floor Area for calculation of Window to Floor Area (WFA) shall include conditioned basements. Conditioned basements are defined by Northwest ENERGY STAR Homes as basements with rigid foam insulation or insulation that is installed in a furred out wall assembly and that meet vapor permeability and bulk water protection as defined in the Water Management System Builder Checklist. Attached garages shall not be included in the CFA.



Northwest ENERGY STAR® Homes Notes

6. Up to 15 square feet of glazed fenestration per dwelling unit shall be exempt from the U-factor and SHGC requirements.
7. When a heat pump water heater is installed to meet this requirement, please refer to the Northern Climate Specification guidelines at: <http://neea.org/northernclimatespec/>, and NEEA's Heat Pump Water Heater (HPWH) Best Practices Installation Guide at: http://smartwaterheat.org/sites/default/files/Smart_Water_Heat_Best_Practices_Installation_Guide.pdf.
8. Certification of a duct system under the Northwest ENERGY STAR Homes program is consistent with the EPA ENERGY STAR Homes specification. The specification may also be found on the Rater Field Checklist.

Each system requires testing and the measured duct leakage to outdoors CFM25 shall not exceed $0.04 \times$ floor area served by the system (in square feet) or 40 CFM25, whichever is greater, and the factory-supplied air handler shall be in place at the time of the test. The following exceptions exist:

- If both the ducts and equipment are located within the conditioned space, the system is exempted from the duct-testing requirement. Up to five percent (5%) of the linear feet of the duct system may be located outside the thermal and/or air barriers of the house, or in exterior cavities of the house.
- If the air handler is located completely within conditioned space, it is not required to be in place during the test.
- If the air handler is located in unconditioned space, it is not required to be in place during the test. However, the leakage limit shall be decreased to $0.03 \times$ floor area served by the system (in square feet) or 35 CFM25, whichever is greater.
- If the ducts are located outside of the conditioned space, all boots and registers must be sealed to the air barrier or finished surface.
- If a total leakage test performed at rough in passes the leakage to outside requirements, a duct test at final is not required.
- Note, for instances where State Energy (or Residential/Building) Code require more stringent targets be met or allow for fewer exceptions, the State Code shall be followed.

In cases where Northwest utility incentives (whole house or HVAC specific incentives) are provided, systems must align with Performance Tested Comfort Systems® (PTCS®) specifications. A PTCS-certified technician shall complete the testing and certification process and shall provide documentation of the test results showing compliance to the Rater. Each system requires testing and the measured CFM50 shall not exceed $0.06 \times$ floor area served by the system (in square feet) or 75 CFM50, whichever is greater, and the factory-supplied air handler shall be in place at the time of the test. The following exceptions exist:

- If both the ducts and equipment are located within the conditioned space, the system is exempted from the duct-testing requirement. Up to five percent (5%) of the linear feet of the duct system may be located outside the thermal and/or air barriers of the house, or in exterior cavities of the house.
- If the air handler is located completely within conditioned space, it is not required to be in place during the test.
- If the air handler is located in unconditioned space, it is not required to be in place during the test. However, the leakage limit shall be decreased to $0.04 \times$ floor area served by the system (in square feet) or 50 CFM50, whichever is greater.

9. All exhaust fans shall be ENERGY STAR qualified, except in kitchens and half bathrooms. A half bathroom is any bathroom that does not contain a bathtub, shower, spa, or similar source of moisture. Alternatively, exhaust fans that are not ENERGY STAR qualified must meet the efficacy requirement of 1.4 cfm/w and have a sone rating of 3 or less.
10. Air-to-air H/ERV installations shall:
 - Include documentation that units are installed according to manufacturer's instructions
 - Include a fully ducted (both supply and exhaust) ventilation system with both exhaust and supply airflow. A minimum rating of 65% sensible recovery efficiency (SRE) is required with the unit operating in its installed fan speed mode at 32 deg. F. Units shall be third party tested in accordance with C439-06
 - Be sized and set to operate in accordance to ASHRAE Std 62.2
 - A minimum fan efficacy of 1.33 cfm/W measured at the most typical operational flow rate
 - Supply air to at least one central location in the dwelling. For maximum effectiveness, system should supply air to individual bedrooms as well as other general living spaces
 - Have an easily accessible filter. When such filter is not integral to the H/ERV, filters should be installed on the upstream side of the heat exchanger in the intake airstream
 - Provide protection against ice buildup that does not disable the unit during freezing weather

Connections to the H/ERV shall be made with flexible connectors to reduce vibration. Ductwork shall be located within the conditioned envelope to the maximum extent possible. All ductwork located outside the conditioned building envelope, or between the outside wall and the H/ERV, shall also be fully insulated to R-8 minimum. All ducting should be adequately sealed and supported.

11. This requirement applies to RESNET-defined Qualifying Light Fixture Locations. Also note that the ENERGY STAR Advanced Lighting Package (ALP), which requires a minimum of 80% ENERGY STAR qualified hard-wired fixtures and 100% ENERGY STAR qualified ceiling fans, where installed, may also be used to comply with the lighting requirements.



Northwest ENERGY STAR® Homes Notes

12. When the Watts per square foot strategy is used, please use the Watts per Square Foot Tool (found here: <http://www.northwestenergystar.com/partners/home-verifiers?tid=36&=Apply>) to determine the dwelling's lighting power density. The following guidelines must also be met:
- Every room in the dwelling must have at least one hardwired light fixture
 - A wattage assumption of 64 must be used for all incandescent lamps
 - There are no wattage assumptions for LED or Xenon lights. Actual wattages must be used
 - Total dwelling square footage includes the garage square footage
 - The Watts per Square Foot Tool must be submitted at time of verification
13. For townhomes, builders may choose to follow the [Northwest ENERGY STAR Single-Family Homes Requirements](#), so long as the following requirements are met:
- a. By modeling the townhome in Northwest REM/Rate™, the Rater must show that both an end unit and center unit would consume equal to or less energy than units built to the Multifamily BOP; **AND**
 - b. The Provider approves the Rater's model in Northwest REM/Rate
14. The term "Rater/Rating Field Inspector" refers to the person completing the third-party inspections required for certification. This person shall:
- Be a certified Home Energy Rater, Rating Field Inspector, BOP Inspector, or an equivalent designation as determined by a Verification Oversight organization such as RESNET; **AND**
 - Have attended and successfully completed an EPA-recognized training class. See www.energystar.gov/newhomestraining. Raters who operate under a Sampling Provider are permitted to verify the Minimum Rated Features of the home using the RESNET-approved sampling protocol.

Northwest Multifamily Sampling Protocol

Multifamily dwelling units in the Northwest certified using the prescriptive path were permitted to use this sampling protocol during verification.



Northwest ENERGY STAR® Homes Multifamily Sampling Protocol Agreement

I. Introduction

This agreement specifies the sampling protocol that applies to verification of Northwest ENERGY STAR Homes Multifamily buildings. This document aligns with the sampling protocol outlined in Chapter 6 of the RESNET Standards found at:

www.resnet.us/standards/RESNET_Mortgage_Industry_National_HERS_Standards.pdf.

The protocol is intended for builders who demonstrate consistency in their specifications and production processes. It is intended to minimize production interruptions and verification costs, while ensuring that buildings still meet or exceed the Northwest ENERGY STAR Homes Multifamily certification guidelines.

The following minimum requirements must be met for Northwest ENERGY STAR Checklists* in Multifamily projects:

- One (1) Northwest HVAC Contractor Checklist and one (1) Northwest HVAC Verifier Checklist shall be completed for each heating/cooling system that is verified
- One (1) Northwest Thermal Enclosure Checklist shall be completed per floor
- One (1) Northwest Water Management Checklist shall be completed per building

**The HVAC Checklist testing requirements may qualify for sampling as per the Performance Testing Addendum on Page 4.*

*Note that sampling applies only to the **Verification** of buildings (Builder Option Package and Northwest HVAC System Quality Installation Checklists). All performance testing requirements outlined in the specifications for the appropriate BOP must be completed prior to certification. For information about when sampling can be applied to performance testing, see the Performance Testing Addendum on page 4. For additional technical specifications, please refer to the [Northwest ENERGY STAR Partner Resources](#) webpage.*

II. Sampling Protocol

Rater Qualifications

Raters shall be in good standing with the Northwest ENERGY STAR Homes program and shall only offer sampling services when **in partnership with an approved Sampling Provider**. Raters should contact their Provider to inquire about both parties' qualification for sampling. The Sampling Provider may determine the percentage of units to be tested, which shall be no less than the rate identified [in Chapter 6 of the RESNET Standards](#) and the Technical Requirements below.

Builder Qualifications*

In order to participate in the Northwest ENERGY STAR Homes program, the builder must follow the steps for enrollment outlined on the [Builder Enrollment webpage](#), including signing a Builder Partnership Agreement with the EPA.

To be eligible for sampling, the builder must work with your Rater to sign and submit this Sampling Protocol Agreement to your Sampling Provider for approval **AND**:

- Complete ten (10) consecutive townhomes without failure in that metropolitan area **or**
- Build a multifamily building with 25 units or more **or**
- Have successfully completed a Multifamily project within the past year

**For more information on builder qualifications, refer to the Performance Testing Addendum on page 4*

Technical Requirements

Unit Eligibility

- Sampling can only be conducted for units that have the same general size and layout, and use the same envelope systems:
 - At least 1 unit shall be verified for every 7 units that share the same **size** (square footage differing by no more than 10%), and **type** (same number of bedrooms, end unit vs. central unit, top floor vs. bottom floor, ADA accessible units, etc.)
 - At least one unit shall be verified for every unit type in the building

Labeling of Building

- Once the Multifamily building has been certified, the Rater shall generate a certification label from the Northwest ENERGY STAR Homes database, Axis, and place the label on the electrical panel.

Testing Requirements

The following conditions apply to building tightness testing, for which requirements are listed in the Northwest ENERGY STAR Multifamily BOPs:

- Where infiltration testing is not required by code, this standard can be met through verified compliance with the Northwest Thermal Enclosure System Checklist and ventilation system requirements.
- Where the authority having jurisdiction requires testing to a published standard or methodology, this requirement shall be met in accordance with code accepted standards and methodologies. Where no such methodology is provided, the following is considered acceptable by Northwest ENERGY STAR Homes:

Compliance with this requirement shall be determined according to the following means:

- In areas where the authority having jurisdiction requires testing to a published standard or methodology, this requirement shall be met in accordance with code accepted standards and methodologies.
- RESNET, the EPA and Northwest ENERGY STAR Homes recommend unit by unit testing, as opposed to whole building testing.
- Where no such methodology is provided, the following will be considered acceptable by Northwest ENERGY STAR Homes:
 - ENERGY STAR MF HIGH RISE testing standards
 - ASHRAE 62,2 2013 testing on a 15% sample of each dwelling unit type and floor plan
 - LEED NC Environmental Tobacco Smoke Control Testing on a 15% sample of each dwelling unit type and floor plan
 - In the event that local codes require whole building testing: *Follow whole building leakage testing in accordance with protocols published by Retrotec or The Energy Conservatory*

Where infiltration testing is not required by code, this standard may be assumed to be met through verified compliance with the Thermal Enclosure System Checklist and ventilation system requirements.

** The sample will total 15% or a minimum of one for each unit sharing both the same size and type, whichever is greater.*

Sampling Controls

“Sampling controls” are the tests and inspections required of the Rater to confirm that the specifications have been met.

- Sampling controls must be completed at a minimum ratio of one (1) test or inspection per seven (7) units
- A qualified Northwest ENERGY STAR Verifier/Rater must oversee the sampling process
- Sampling controls may be completed on an individual Multifamily unit or several units within a given

Creating a Sample Set

A “sample set” is the specific group of seven (7) units from which one or more individual units are randomly selected for sampling controls.

- Units to be sampled must be selected within the same building or complex
- Each sample set is made up of units at the same stage of construction, though sample sets do not have to consist of the same seven units throughout all stages of construction (i.e. a different set of units in the same building may be used in the drywall stage than were used in the pre-drywall stage)
- All sampling controls (i.e. tests and inspections) for a sample set at a particular stage of construction must be completed within a 30-day time period
- Sampled buildings and complexes must be subject to sampling controls at least once every 90 days with at least one unit starting construction every 90 days.

Failed Sampled Buildings

- When an initial failure occurs, the failed item(s) shall be tested or inspected in two (2) additional units in the sample set
- When a second failure occurs in one (1) or more of the two (2) additional units, the failed item(s) shall be tested or inspected in the remaining four (4) units in the sample set
- If three (3) additional failures occur within a ninety (90) day period on the same item, the failed item must pass in seven (7) consecutive units before it can be sampled again
- If three (3) additional failures occur within a ninety (90) day period on various items, the builder must re-qualify for sampling by completing seven (7) consecutive units without failure **or** The builder can submit a “Root Cause Analysis” to the Sampling Provider

III. Effective Date

This agreement shall be in effect from the date it is signed by all parties and remain in effect until terminated by one or more parties.

AGREED:

Print

Verifier/Rater Company

Signature

Name

Date

Print

Homebuilder Company

Signature _____ **Name** _____ **Date** _____

Print _____ **Sampling Provider** _____

Signature _____ **Name** _____ **Date** _____

Performance Testing Addendum

Washington, Idaho and Oregon have adopted an addendum to the Multifamily Sampling Protocol Agreement which allows the application of sampling to performance testing. Under this addendum, qualified builders can apply performance testing sampling if they either:

- Commit to building 100% of their single family homes or one or more multifamily buildings to Northwest ENERGY STAR Homes specifications, **or**
- Build a subdivision of 20 or more townhomes all to Northwest ENERGY STAR Homes specifications

Ten initial townhomes (aka units) must consecutively pass both prescriptive and performance requirements for ductwork. In addition, three units must successfully pass the quality assurance process, with a special emphasis placed on the duct and fan flow requirements.

This addendum is intended to reduce performance testing costs for builders who are willing to substantially commit to the Northwest ENERGY STAR Homes program. However, given that improved performance of forced air distribution systems is a cornerstone of the program, increased QA will be provided on buildings built under the scope of this addendum. Failures of the duct system in QA will result in suspension from performance testing sampling until additional testing is undertaken, a report detailing the cause(s) of failure are provided to the Sampling Provider, and subsequent QA visits indicate no recurrence of the problems.

For more information on the details of this sampling protocol addendum, contact info@northwestenergystar.com

Northwest Performance Tested Comfort Systems (PTCS) Commissioning Forms

These forms were used as an alternative means to document the commissioning of air conditioners, air-source heat pumps, and ground-source heat pumps for homes in the Northwest.

Northwest ENERGY STAR Homes Central AC Commissioning & Startup Form

Technician Certification Number PTCS- _____		Installation Company/Name		Electric Utility Company	
Customer Name			Site Street Address		
Site Address 2 (Unit Number)		Site City	Site State	Site Zip Code	Site Phone Number () -
<input type="checkbox"/> Site Built (Existing) Year Built _____	<input type="checkbox"/> Site Built (New Construction) ENERGY STAR Home? <input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Manufactured Home Sections <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	Foundation Type: <input type="checkbox"/> Half Basement <input type="checkbox"/> Full Basement <input type="checkbox"/> Crawl <input type="checkbox"/> Slab	ENERGY STAR Home? <input type="checkbox"/> Y <input type="checkbox"/> N	Super Good Cents? <input type="checkbox"/> Y <input type="checkbox"/> N
What type of heating system is installed at this site? <input type="checkbox"/> Gas Furnace <input type="checkbox"/> Gas Hydronic <input type="checkbox"/> Electric Zonal <input type="checkbox"/> Electric Forced Air <input type="checkbox"/> Other _____				Conditioned floor area of house (square feet)	

SECTION A: SITE INFORMATION

Equipment Data			
AHRI Number:		SEER	
Outdoor Unit Make		Outdoor Unit Model Number	Capacity (tons)
			# of Compressor Stages
Indoor Unit Make		Indoor Unit Model Number	Capacity (tons)

Does the Indoor Unit have an ECM blower? (check one) <input type="checkbox"/> Yes <input type="checkbox"/> No	Ambient Temp _____ °F	Unit Test Method (check one) Weigh-in method may only be used if ambient temperature is below 65°F or the manufacturer-recommended operating temperature for the cooling equipment. If Weigh-in Method is used, TXV must be present.	<input type="checkbox"/> Sub Cooling <input type="checkbox"/> Weigh-in	Stage or Capacity Tested
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External Static Pressure Test —Check in full capacity unless conditions do not permit. Attach additional sheets as needed if test must be re-run.	
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1. Record expected CFM/Ton based on fan wiring/board settings.
2. Measure return plenum static pressure.
3. Measure supply plenum pressure.
4. Add values together (ignore minus “-” sign on return pressure).

TrueFlow Test		Cooling CFM/Ton Setting 1	Note: Result of 0.8 Inch H₂O (200 Pa) or more in Step 4 can result in extreme fan energy use and early fan failure	
		Return Static Pressure 2 [A]		Units (check one) <input type="checkbox"/> Inches H ₂ O <input type="checkbox"/> Pa
		Supply Static Pressure 3 [B]		External Static Pressure 4 [C] [A] + [B] = [C]

1. Measure Normal Supply Operating Pressure (NSOP) or re-record Supply Static Pressure from above.
2. Specify TrueFlow plate # and filter size.
3. Install True Flow plate at filter slot and specify location.
4. Measure Supply Pressure with plate in (TFSOP)
5. Determine Correction Factor (as needed)
6. Measure pressure across TrueFlow plate and record Raw Flow (in CFM).

SECTION B: AIRFLOW TEST

Northwest ENERGY STAR Homes Central AC Commissioning & Startup Form

7. Calculate Corrected Flow = (Raw Flow x Correction Factor)

	NSOP	1 [A]	Plate Size (check one)	2	Units (Check one)
			<input type="checkbox"/> 14 <input type="checkbox"/> 20		<input type="checkbox"/> Inches H ₂ O <input type="checkbox"/> Pa
	Filter Location (check one)	Indoor Unit <input type="checkbox"/>	Return Grille <input type="checkbox"/>	Other (explain) <input type="checkbox"/>	3
	TFSOP	4 [B]	Enter Correction Factor (CF) from table or use formula		5 [C]
			$\frac{\text{NSOP [A]}}{\text{TFSOP [B]}}$		
	Plate Pressure		Raw Flow (CFM)		6 [D]
			CFM/Ton	Is flow above 350/Ton?	
				<input type="checkbox"/> Yes <input type="checkbox"/> No	

Refrigerant Charge Information/Testing *To be completed by certified technician at time of installation*

Total lineset length: _____ ft	Refrigerant Adjustment (if any)	Stage/Capacity Test
If Weigh-in Method is used, TXV must be present.		TXV present? <input type="checkbox"/> Y <input type="checkbox"/> N

Performance Check *Run unit for at least 15 minutes in compressor-only mode before taking readings.*

Sub Cooling Test *Acceptable deviation of +/- 3F*

Discharge Pressure	Temp °F [A] (From Chart)
Measured Liquid Line Temp [B]	Sub Cooling [A] - [B] Acceptable? <input type="checkbox"/> Y <input type="checkbox"/> N
Notes	

Verification of Compliance – *To be completed by technician at the time of installation*

As a certified PTCS™ Technician, I have verified that the commissioning performed on this site and equipment is in accordance with the System Airflow and Refrigerant Charge (sections B and C) of this form.

PTCS™ Certified Technician Name (Print)	Date
PTCS™ Certified Technician Signature (Required)	PTCS™ Certified Technician Phone Number

SECTION C: REFRIGERANT CHARGE INFORMATION/TESTING

SECTION E: COMPLIANCE

PTCS® Air Source Heat Pump Form

All sections must be filled out, signed, and dated by a PTCS Certified Technician at the time of installation. A copy of the completed form must be promptly submitted to the utility and homeowner in accordance with utility policy. Please enter this form online at ptcs.bpa.gov or fax to 877-848-4074. Questions? Call 800-941-3867 or email ResHVAC@bpa.gov.

Site Information (Please print clearly)

PTCS Tech #	PTCS Tech Name	Install Date	Electric Utility
Customer Name		Installation Site Address*	
Site City*	Site State*	Site Zip*	Customer Phone # () -
*Mailing address if different (#, City, St, Zip):			
Home Type: <input type="checkbox"/> Existing Site Built <input type="checkbox"/> New Construction Site Built <input type="checkbox"/> Manufactured: # of Sections <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Heated Area: Sq Ft	Year Built:	Foundation Type (Site Built): <input type="checkbox"/> Crawlspace <input type="checkbox"/> Full Basement <input type="checkbox"/> Half Basement <input type="checkbox"/> Slab	
Existing Heating System Being Replaced (If new home, indicate heating system installed):			
<input type="checkbox"/> Electric Forced Air <input type="checkbox"/> Electric Forced Air w/ AC <input type="checkbox"/> Electric Zonal <input type="checkbox"/> Air Source Heat Pump <input type="checkbox"/> Geothermal Heat Pump <input type="checkbox"/> Natural Gas Furnace (Gas Company: _____) <input type="checkbox"/> Other Non-Electric Space Heating: _____			
Back up Heat: <input type="checkbox"/> None <input type="checkbox"/> Elec. Forced Air <input type="checkbox"/> Elec. Zonal <input type="checkbox"/> Heat Pump <input type="checkbox"/> Natural Gas Furnace <input type="checkbox"/> Non-Electric Space Heating			

New Heat Pump Equipment Data

****PTCS requires minimum 9.0 HSPF, 14 SEER. Commissioning, Controls & Sizing requires Federal minimum. Check with utility for requirements.**

AHRI #	SEER**	HSPF**	EER	Outdoor HP Capacity (tons)
Heat Pump Make	Outdoor HP Model #	<input type="checkbox"/> HP Single Stage <input type="checkbox"/> HP Multi Stage _____ <input type="checkbox"/> HP Variable Speed		
	Indoor HP Model #	What is the Balance Point? _____ Provide BP calculation to utility.		

External Static Pressure Test

Check unit operating at full capacity unless conditions do not permit. Attach additional sheets as needed if test must be re-run.

<ol style="list-style-type: none"> Record expected CFM/ton based on fan wiring board settings Measure return static pressure Measure supply plenum static pressure Calculate external static pressure: add values in #2 and #3 values together, ignoring the minus sign 	1a. Testing Mode Used: <input type="checkbox"/> Heating <input type="checkbox"/> Cooling 2. Return Static Pressure 3. Supply Static Pressure	1b. CFM/Ton Setting Units (check one): <input type="checkbox"/> Pa <input type="checkbox"/> Inches H ₂ O 4. External Static Pressure	Note: Any External Static Pressure above 200 Pa or 0.8 Inches H₂O will result in a rejection.
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TrueFlow Test

Use the Performance Checks in the Reference Materials at www.bpa.gov/goto/reshvac to determine acceptable performance, unless using an alternative method.

<ol style="list-style-type: none"> Measure Normal System Operating Pressure (NSOP) [A] Check TrueFlow plate size and units Note TrueFlow plate location Measure Supply Pressure with TrueFlow plate in (TFSOP) [B] Calculate Correction Factor [C] Measure plate pressure Enter Raw Flow CFM from tables [D] Calculate Corrected Flow (CFM = [C] x [D]) Calculate CFM/ton 	1. NSOP [A]	2a. Plate Size: <input type="checkbox"/> 14 <input type="checkbox"/> 20	2b. Units (check one) Use same units ESP: <input type="checkbox"/> Pa <input type="checkbox"/> Inches H ₂ O
	3. Filter Location: <input type="checkbox"/> Air Handler <input type="checkbox"/> Return Grille <input type="checkbox"/> Other (specify):		
	4. TFSOP [B]	5. Correction Factor [C] from table or calculate $\sqrt{[A]/[B]}$	
	6. Plate Pressure	7. Raw Flow CFM from tables [D]	
	8. Corrected Flow CFM = [C] x [D]	9. CFM/ton	Is flow at or above 325 CFM/ton? <input type="checkbox"/> Y <input type="checkbox"/> N Please submit proof of manufacturer target CFM/Ton if under 325.

Refrigerant Charge Information

Outside Air Temp °F	Mode unit tested in: <input type="checkbox"/> Heating <input type="checkbox"/> Cooling <input type="checkbox"/> Alternative <i>If > 65°F, test in cooling; if ≤ 65°F, test in heating.</i>	Are the refrigeration piping/other penetrations sealed? <input type="checkbox"/> Yes <input type="checkbox"/> No
Stage/Capacity Tested <input type="checkbox"/> High <input type="checkbox"/> Low <input type="checkbox"/> Other (specify):	Total lineset length ft.	Refrigerant Adjustment: <input type="checkbox"/> Added _____ oz. <input type="checkbox"/> Removed _____ oz. <input type="checkbox"/> None

Performance Check: Run unit for at least 15 minutes in compressor-only mode before taking readings.

Use the Performance Checks in the Heat Pumps section at www.bpa.gov/goto/reshvac to determine acceptable performance, unless using alt. method.

Heating Mode (65°F or lower)	Cooling Mode (higher than 65°F)	Alternative Method
Supply Air (SA) Temp:	Discharge Pressure:	Specify method used:
Return Air (RA) Temp:	Discharge Temp [A]:	Target:
Temp Split (SA – RA):	Liquid Line Temp [B]:	Test result:
Expected Temp Split from table: Is it acceptable? <input type="checkbox"/> Y <input type="checkbox"/> N	Sub cooling [A] – [B]: Is it acceptable? <input type="checkbox"/> Y <input type="checkbox"/> N	Is it acceptable? <input type="checkbox"/> Y <input type="checkbox"/> N

Controls

Compressor Low Ambient Lockout control (LAL) setting at 5° or less? <input type="checkbox"/> Yes <input type="checkbox"/> Not Installed/Disabled <input type="checkbox"/> Non-Electric Backup <input type="checkbox"/> No	Auxiliary (strip) heat lockout has been set to <input type="checkbox"/> 35°F <input type="checkbox"/> Below 35°F
Single Capacity Compressor Systems <input type="checkbox"/> Applicable <input type="checkbox"/> Not Applicable	Make <u>and</u> Model of Heat Pump Thermostat
Multiple Capacity Compressor systems (<input type="checkbox"/> Applicable <input type="checkbox"/> Not Applicable) <input type="checkbox"/> If the discharge air sensor control is used to control auxiliary heat, confirm it is set no higher than 85 °F or, <input type="checkbox"/> If staging thermostat is set warmer than 85 °F, confirm resistance heat cannot operate at temperatures above 35°F	Confirm discharge air temperature sensor is either not installed or is disabled. <input type="checkbox"/> Confirmed

Notes

Required Signatures: This section shall be filled out by the electrical utility account holder. This form must be signed by the person whose name appears on the electric utility account. ENERGY INFORMATION RELEASE: The undersigned utility customer requests and authorizes the specified utility to release billing and usage information for the account listed below to the PTCS program. With this authorization, the PTCS program can request billing information for up to two years pre-installation and two years post-installation. The utility customer also hereby releases the utility company from any and all liability arising from or connected with providing this information.

Electric Utility	Account #
Account Holder Name	
Account Holder Signature	Date
By signing below, technician certifies that this form and any accompanying documentation are complete and accurate, and that all measures associated with this project were completed as of the signature date below.	
Technician Name	Installation Company
Technician Signature	Date Tech Phone # () -

PRIVACY ACT STATEMENT

Basic authority for collecting this information is authorized by 16 U.S.C. §§ 832 et. seq., and 838 et. seq., pursuant to Bonneville Power Administration's Conservation Program system of records established in 46 FR 31700. This information is primarily intended to further, but is incidental to the performance of, BPA's overall Energy Efficiency Program, the objective of which is to acquire energy resources through energy efficiency, to determine what cost-effective conservation and direct application renewable resources measures should be installed or adopted under different circumstances, and to provide incentives for the installation of such measures. Other routine issues of this information include: aggregation into a public database on energy efficiency; furnished to authorized personnel for installation/repair of equipment; aggregated into a database for program publicity; and in some instances information regarding buildings will be made available to subsequent purchasers of the buildings. Your disclosure of the requested information is voluntary; however failure to provide requested information means that it will not be possible for you to participate in this BPA Energy Efficiency program.

PTCS® Ground Source Heat Pump Form

All sections must be filled out, signed, and dated by technician(s) certified in PTCS and IGSHPA at the time of install. A copy of the completed form must be promptly submitted to the utility and homeowner in accordance with utility policy. Please enter this form online at ptcs.bpa.gov or fax to 877-848-4074. Questions? Call 800-941-3867 or email ResHVAC@bpa.gov.

Site Information (Please print clearly)		Install Date	Electric Utility		
PTCS Tech Name		PTCS Tech #	IGSHPA Certified Tech Name		IGSHPA #
Customer Name		Installation Site Address*			
Site City*		Site State*	Site Zip*	Customer Phone # () -	
*Mailing address if different (#, City, St, Zip):					
Home Type: <input type="checkbox"/> Existing Site Built <input type="checkbox"/> New Construction Site Built <input type="checkbox"/> Manufactured: # of Sections <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3					
Heated Area:	Sq Ft	Year Built:	Foundation Type (Site Built): <input type="checkbox"/> Crawlspace <input type="checkbox"/> Full Basement <input type="checkbox"/> Half Basement <input type="checkbox"/> Slab		
Existing Heating System Being Replaced (If new home, indicate heating system installed):					
<input type="checkbox"/> Electric Forced Air <input type="checkbox"/> Electric Forced Air w/ AC <input type="checkbox"/> Electric Zonal <input type="checkbox"/> Air Source Heat Pump <input type="checkbox"/> Geothermal Heat Pump <input type="checkbox"/> Natural Gas Furnace (Gas Company: _____) <input type="checkbox"/> Other Non-Electric Space Heating: _____					
Back up Heat: <input type="checkbox"/> None <input type="checkbox"/> Elec. Forced Air <input type="checkbox"/> Elec. Zonal <input type="checkbox"/> Heat Pump <input type="checkbox"/> Natural Gas Furnace <input type="checkbox"/> Non-Electric Space Heating					

New Heat Pump Equipment Data

**PTCS requires GSHPs to be Energy Star qualified. Visit energystar.gov.

**Energy Star? <input type="checkbox"/> Y <input type="checkbox"/> N		<input type="checkbox"/> Closed Loop <input type="checkbox"/> Open Loop <input type="checkbox"/> Pond	<input type="checkbox"/> Vertical Loop <input type="checkbox"/> Horizontal Loop	<input type="checkbox"/> Forced Air Furn. <input type="checkbox"/> Hydronic	Capacity (tons)
AHRI#	Heat Pump Make	Heat Pump Model #			
<input type="checkbox"/> HP Single Stage <input type="checkbox"/> HP Multi Stage _____ <input type="checkbox"/> HP Variable Speed		What is the Balance Point? _____ Provide BP calculation to utility.		Are the refrigeration piping/other penetrations sealed? <input type="checkbox"/> Yes <input type="checkbox"/> No	
For Closed Loop Systems Total external loop length: _____ ft.		For Horizontal ground loop Average in-ground loop depth: _____ ft.		For Vertical Loop No. _____ and depth _____ ft. of boreholes	
For Open loop Systems Supply side depth (elevation difference between water source and heat pump): _____ ft.					
Return water: <input type="checkbox"/> Re-injected into ground. Re-injection depth (elevation difference between heat pump and re-injection point): _____ ft.					
<input type="checkbox"/> Discharged onto the surface. Specify surface:					

True Flow Test (Not necessary for Water to Water systems)

Units (check one): <input type="checkbox"/> Heating <input type="checkbox"/> Cooling		External Static Pressure		Filter Location: <input type="checkbox"/> Air Handler <input type="checkbox"/> Return Grille <input type="checkbox"/> Other: _____		Units: <input type="checkbox"/> Pa <input type="checkbox"/> H ₂ O	
Plate Size	Plate 1 <input type="checkbox"/> 14 <input type="checkbox"/> 20	Plate 2 <input type="checkbox"/> 14 <input type="checkbox"/> 20	Plate 3 <input type="checkbox"/> 14 <input type="checkbox"/> 20	True Flow Test Notes			
NSOP [A]							
TFSOP [B]							
Plate Pressure							
Correction Factor [C] = $\sqrt{[A]/[B]}$ or from table							
Raw Flow CFM from tables [D]							
Corrected Flow CFM = [C] x [D]				Total CFM	CFM/ton		

Auxiliary Heating System

Auxiliary (strip) heat lockout: greater than 30°F Other (specify):

Flow Rate in GPM

*For GPM flow rate use manufactures startup instructions, numbers in PTCS specs, or measure directly.

Loop In Pressure [A]	Loop Out Pressure [B]	Pressure Drop [A-B]
GPM flow rate from Mfg. table*	Calculate GPM/ton	GPM/ton requirement met: <input type="checkbox"/> Y <input type="checkbox"/> N

PTCS Commissioned Ground Source Installation Checklist

Temperature Rise/Drop across Ground Loop					
Tests to be performed w/o desuperheater after 15 min continuous operation.					
Mode unit tested in: <input type="checkbox"/> Heating <input type="checkbox"/> Cooling					
Existing Condition	Cooling	Heating	After Adjusted Cond. (If necessary)	Cooling	Heating
Loop in Temp.	°F	°F	Loop in Temp.	°F	°F
Loop out Temp.	°F	°F	Loop out Temp.	°F	°F
Temp. Diff.	°F	°F	Temp. Diff.	°F	°F
Target Diff.**	°F	°F	Target Diff.**	°F	°F
Temperature Rise/Drop across Air Coil Check after 15 minutes of continuous operation.					
Existing Condition	Cooling	Heating	After Adjusted Cond. (If necessary)	Cooling	Heating
Supply Air Temp.	°F	°F	Supply Air Temp.	°F	°F
Return Air Temp.	°F	°F	Return Air Temp.	°F	°F
Temp. Diff.	°F	°F	Temp. Diff.	°F	°F
Target Diff.**	°F	°F	Target Diff.**	°F	°F

**Refer to manufacturer's installation guide for target loop and air-side temperature splits. If measured splits do not meet the manufacturer's specifications, repair and re-test until specs are met.

Notes

Required Customer and Technician Signatures

To be filled out by the electrical utility account holder. This form must be signed by the person whose name appears on the electric utility account. ENERGY INFORMATION RELEASE: The undersigned utility customer requests and authorizes the specified utility to release billing and usage information for the account listed below to the PTCS program. With this authorization, the PTCS program can request billing information for up to two years pre-installation and two years post-installation. The utility customer also hereby releases the utility company from any and all liability arising from or connected with providing this information.

Electric Utility		Account #	
Account Holder Name		Account Holder Signature	
Date			
By signing below, technician certifies that this form and any accompanying documentation are complete and accurate, and that all measures associated with this project were completed as of the signature date below.			
PTCS Technician Name		Installation Company	
PTCS Technician Signature		Date	PTCS Tech Phone # () -
IGHSPA Certified Tech Signature (if different)		Date	IGHSPA Tech Phone # () -

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Closed Loop GSHP Specification Requirements Checklist (Specification dated October 4, 2011)

Installation	Equipment including filter(s) is accessible. <input type="checkbox"/> Y <input type="checkbox"/> N	All direct potable water connections protected by approved backflow prevention devices. <input type="checkbox"/> Y <input type="checkbox"/> N		
Pump(s)	≤ 165 Watts/nominal ton and sized to provide 3 GPM/ton. <input type="checkbox"/> Y <input type="checkbox"/> N	Pumps are cast iron and or bronze. <input type="checkbox"/> Y <input type="checkbox"/> N	Flow centers have filling and air purge ports. <input type="checkbox"/> Y <input type="checkbox"/> N	
Pipe	HDPE & PEX piping rated/designed for GSHP systems per IGHSPA. <input type="checkbox"/> Y <input type="checkbox"/> N	HDPE socket weld, electro-fusion, or butt weld. <input type="checkbox"/> Y <input type="checkbox"/> N	Only non-metallic connections on PEX. <input type="checkbox"/> Y <input type="checkbox"/> N	
Controls	Installed auxiliary heat capacity does not exceed 125 percent of the heating design load. <input type="checkbox"/> Y <input type="checkbox"/> N	Auxiliary heat does not operate during a 1 st stage heating call, except in emergency heat. <input type="checkbox"/> Y <input type="checkbox"/> N		
Horizontal Loops <input type="checkbox"/> NA	Designed and sized for 30°F min Entering Water Temperature (EWT). <input type="checkbox"/> Y <input type="checkbox"/> N			
Vertical Ground Loop <input type="checkbox"/> NA	Designed/sized for 30°F min EWT. <input type="checkbox"/> Y <input type="checkbox"/> N	Boreholes as designed. <input type="checkbox"/> Y <input type="checkbox"/> N	Detailed drilling log for boreholes. <input type="checkbox"/> Y <input type="checkbox"/> N	Boreholes grouted correctly. <input type="checkbox"/> Y <input type="checkbox"/> N
Pond/Lake Loop <input type="checkbox"/> NA	Heat exchanger is installed beneath at least 8 feet of water in all seasons and designed/sized for 30°F min EWT. <input type="checkbox"/> Y <input type="checkbox"/> N			
Hydronic Systems <input type="checkbox"/> NA	Newly poured concrete slabs designed for 100°F design water delivery temperatures. <input type="checkbox"/> Y <input type="checkbox"/> N	Insulation R-15 4' perimeter and R-10 under the rest of the slab. <input type="checkbox"/> Y <input type="checkbox"/> N		
Desuperheater <input type="checkbox"/> NA	Approved for this model by manufacturer. <input type="checkbox"/> Y <input type="checkbox"/> N	Vented double-wall heat exchanger. <input type="checkbox"/> Y <input type="checkbox"/> N	Constructed of copper, cupro-nickel, or stainless. <input type="checkbox"/> Y <input type="checkbox"/> N	
Desuperheater Pump	Is rated by UL or ETL-US. <input type="checkbox"/> Y <input type="checkbox"/> N	Bronze construction. <input type="checkbox"/> Y <input type="checkbox"/> N	Potable water rated. <input type="checkbox"/> Y <input type="checkbox"/> N	
Desuperheater Preheat Tank	IAPMO/NSF/GAMA rated electric tank manufacturer. <input type="checkbox"/> Y <input type="checkbox"/> N	GAMA EF rating 0.93. <input type="checkbox"/> Y <input type="checkbox"/> N	Glass Lined Steel tank, 50 gal min size. <input type="checkbox"/> Y <input type="checkbox"/> N	

PTCS® Duct Sealing Form

All sections must be filled out, signed, and dated by a PTCS Certified Technician at the time of installation. A copy of the completed form must be promptly submitted to the utility and homeowner in accordance with utility policy. Please enter this form online at ptcs.bpa.gov or fax to 877-848-4074. Questions? Call 800-941-3867 or email ResHVAC@bpa.gov.

Site Information (Please print clearly)

PTCS Tech #	PTCS Tech Name	Install Date	Electric Utility
Customer Name		Installation Site Address*	
Site City*	Site State*	Site Zip*	Customer Phone # () -
*Mailing address if different (#, City, St, Zip):			
Home Type: <input type="checkbox"/> Existing Site Built <input type="checkbox"/> Manufactured: # of Sections <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3			
Heated Area: Sq Ft	Year Built:	Foundation Type (Site Built): <input type="checkbox"/> Crawlspace <input type="checkbox"/> Full Basement <input type="checkbox"/> Half Basement <input type="checkbox"/> Slab	Air Handler installed? <input type="checkbox"/> Y <input type="checkbox"/> N
Existing Heating System: <input type="checkbox"/> Elec. Forced Air <input type="checkbox"/> Elec. Forced Air w/ AC <input type="checkbox"/> Elec. Zonal <input type="checkbox"/> Air Source Heat Pump <input type="checkbox"/> Geothermal Heat Pump <input type="checkbox"/> Natural Gas Furnace (Gas Company: _____) <input type="checkbox"/> Other Non-Electric Space Heating: _____			# Supply
Back up Heat: <input type="checkbox"/> None <input type="checkbox"/> Elec. Forced Air <input type="checkbox"/> Elec. Zonal <input type="checkbox"/> Heat Pump <input type="checkbox"/> Nat. Gas Furnace <input type="checkbox"/> Non-Elec. Space Heating			# Returns
Location of Duct Work. Ducts are considered to be in unconditioned space when they are in vented crawlspaces, attics, and unheated garages. Basements are considered conditioned space. The bellies of manufactured homes are considered accessible.			
Are at least 30% of supply ducts in unconditioned space and accessible? <input type="checkbox"/> Y <input type="checkbox"/> N <i>If no, the home does not qualify for PTCS Duct sealing.</i>			

House Pressurization and Duct Blaster Tests *Work must be done to PTCS Duct Sealing Specification found at bpa.gov/goto/reshvac.*

Do either of these special conditions apply? (check if "yes") <input type="checkbox"/> Record Only – no duct sealing work done <input type="checkbox"/> PTCS Certification ONLY – pretest leakage too low to qualify		Testing Equipment Used: <input type="checkbox"/> Energy Conservatory <input type="checkbox"/> RetroTec <input type="checkbox"/> AeroSeal <input type="checkbox"/> Air Care <input type="checkbox"/> Other:		
Duct Insulation <i>Select one:</i> <input type="checkbox"/> Ducts were not insulated OR <input type="checkbox"/> Existing duct insulation was re-installed OR <input type="checkbox"/> New insulation was installed				
House Pressurized (Blower Door) to: <input type="checkbox"/> +50Pa <input type="checkbox"/> Other Pa	Duct Blaster Location: <input type="checkbox"/> Return Grille <input type="checkbox"/> Other:	Pressure Tap Supply Register Location:		
<p>Duct Leakage Test: DUCT BLASTER CFM READING with Duct Pressure at 0Pa with respect to house and Blower Door @ +50Pa.</p> <p>Duct Blaster Fan Pressure: It is the fan pressure, NOT the house pressure. (Ex. Ring 1, 78 Pa Fan Pressure, 364 CFM)</p> <p>Note: CFM leakage is calculated in the online registry using the ring size and fan pressure.</p>	Pre-Test	Existing Home, Site Built	Manufactured Home	
		Pre-test Ring (select one)	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> Open <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> Open <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L
		Duct Blaster Fan Pressure	Pa	Pa
		Duct Blaster CFM	CFM	CFM
	Pre-leakage Requirements (BPA Only)	<input type="checkbox"/> ≥ 250 CFM (>1667 sq ft) <input type="checkbox"/> ≥ 15% of home's sq ft	<input type="checkbox"/> ≥ 100 CFM, Single Wide <input type="checkbox"/> ≥ 150 CFM, Double Wide <input type="checkbox"/> ≥ 225 CFM, Triple Wide	
	Post-Test	Post-test Ring (select one)	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> Open <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> Open <input type="checkbox"/> H <input type="checkbox"/> M <input type="checkbox"/> L
		Duct Blaster Fan Pressure	Pa	Pa
		Duct Blaster CFM	CFM	CFM
Certification Requirements (check all that apply)		<input type="checkbox"/> ≤ 10% of home's sq ft <input type="checkbox"/> ≥ 50% Reduction	<input type="checkbox"/> ≤ 50 CFM, Single Wide <input type="checkbox"/> ≤ 80 CFM, Double Wide <input type="checkbox"/> ≤ 110 CFM, Triple Wide <input type="checkbox"/> ≥ 50% Reduction	

Specification Requirements The duct sealing at this site meets program requirements including: repairs, metal ducts secured with screws, flex duct interior and exterior liners secured with nylon straps or steel band clamps, ducts are supported and off the ground, boots are mechanically fastened to floor/ceiling, plenum, main ducts, takeoffs and boots sealed, and a good faith effort was made to remove existing duct tape and cover with mastic. Y N

Combustion Appliance Zone (CAZ) Test

Are there any combustion appliances in the home? Y N
Combustion Appliance Type: Fireplace or wood stove
 Gas Furnace Gas water heater Other: _____

Is there a UL-approved and functioning CO detector installed in the home? Y N
 A carbon monoxide (CO) detector installed in the home is **required** in all cases where a sealed or non-sealed combustion appliance is located in a conditioned space or attached structure i.e. garage. RECOMMENDED CO detector specifications: UL 2034/CSA 6.19-01, digital display, peak CO memory and recall.

Is a Combustion Air Zone (CAZ) test required by the electric utility? Yes, complete the fields below No, skip to notes

Baseline Pressure with reference to outside (all exhaust devices and air handler fan off): _____ Pa
 Weather conditions on day of test: Calm Windy

With air handler fan ON, record gauge readings:		Interior doors open		Interior doors closed	
Zone Description		Reading (Pa)	Net (Pa)	Reading (Pa)	Net (Pa)
Zone 1					
Zone 2					

Net Depressurization = Net (Pa) = All fans off Reading (Pa) (minus) Air Handler Fan on Reading (Pa)
 Example: Baseline reading with all fans off = 1 Pa; Reading with air handler fan on = -2Pa. Net Depressurization = 1 - (-2) = 3 Net Depressurization (Net) equals how much the pressure goes down when the air handler is turned ON (compared to the fan off baseline pressure).

Notes

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Electric Utility _____ **Account #** _____

Account Holder Name _____

Account Holder Signature _____ **Date** _____

By signing below, technician certifies that this form and any accompanying documentation are complete and accurate, and that all measures associated with this project were completed as of the signature date below.

Technician Name _____ **Installation Company** _____ **Tech Phone #** () -

Technician Signature _____ **Date** _____

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Northwest Performance Testing Sticker

This sticker was used as a supplemental means to indicate the performance testing results for homes certified in the Northwest.

NORTHWEST



Northwest ENERGY STAR® Homes Performance Testing

Company Information

Company Name _____
Technician _____ Date _____

Combustion Appliance Zone (CAZ) Test

Main Zone Zone 2, if applies
CAZ Test WRT Outside _____ Pa _____ Pa
Baseline (WRT Outside, fans off) _____ Pa _____ Pa
NET CAZ Pressure (subtract baseline from CAZ WRT outside) _____ Pa _____ Pa

Duct Leakage (fill out one sticker per duct system)

Measured Leakage Pass : Yes [] No []
Cond. Floor Area System Serves (ft²) _____
Test Method: [] Leakage to Outside or [] Total Leakage
Target CFM _____ [] CFM@50Pa or [] CFM@25Pa
Fan Pressure _____ Pa Test Results _____ CFM _____
Ring (check one) [] Open [] 1 [] 2 [] 3
Duct Blaster Location _____
Pressure Tap Location _____

Blower Door Results

Test Results _____ CFM Volume _____ ACH 50 _____
Test Pressure _____ Pa Baseline _____ Pa
Ring (check one) [] Open [] 1 [] 2 [] 3
Target CFM _____ [] CFM@50Pa or [] CFM@25Pa

NORTHWEST



Northwest ENERGY STAR® Homes Performance Testing

Company Information

Company Name _____
Technician _____ Date _____

Combustion Appliance Zone (CAZ) Test

Main Zone Zone 2, if applies
CAZ Test WRT Outside _____ Pa _____ Pa
Baseline (WRT Outside, fans off) _____ Pa _____ Pa
NET CAZ Pressure (subtract baseline from CAZ WRT outside) _____ Pa _____ Pa

Duct Leakage (fill out one sticker per duct system)

Measured Leakage Pass : Yes [] No []
Cond. Floor Area System Serves (ft²) _____
Test Method: [] Leakage to Outside or [] Total Leakage
Target CFM _____ [] CFM@50Pa or [] CFM@25Pa
Fan Pressure _____ Pa Test Results _____ CFM _____
Ring (check one) [] Open [] 1 [] 2 [] 3
Duct Blaster Location _____
Pressure Tap Location _____

Blower Door Results

Test Results _____ CFM Volume _____ ACH 50 _____
Test Pressure _____ Pa Baseline _____ Pa
Ring (check one) [] Open [] 1 [] 2 [] 3
Target CFM _____ [] CFM@50Pa or [] CFM@25Pa

NORTHWEST



Northwest ENERGY STAR® Homes Performance Testing

Company Information

Company Name _____
Technician _____ Date _____

Combustion Appliance Zone (CAZ) Test

Main Zone Zone 2, if applies
CAZ Test WRT Outside _____ Pa _____ Pa
Baseline (WRT Outside, fans off) _____ Pa _____ Pa
NET CAZ Pressure (subtract baseline from CAZ WRT outside) _____ Pa _____ Pa

Duct Leakage (fill out one sticker per duct system)

Measured Leakage Pass : Yes [] No []
Cond. Floor Area System Serves (ft²) _____
Test Method: [] Leakage to Outside or [] Total Leakage
Target CFM _____ [] CFM@50Pa or [] CFM@25Pa
Fan Pressure _____ Pa Test Results _____ CFM _____
Ring (check one) [] Open [] 1 [] 2 [] 3
Duct Blaster Location _____
Pressure Tap Location _____

Blower Door Results

Test Results _____ CFM Volume _____ ACH 50 _____
Test Pressure _____ Pa Baseline _____ Pa
Ring (check one) [] Open [] 1 [] 2 [] 3
Target CFM _____ [] CFM@50Pa or [] CFM@25Pa

NORTHWEST



Northwest ENERGY STAR® Homes Performance Testing

Company Information

Company Name _____
Technician _____ Date _____

Combustion Appliance Zone (CAZ) Test

Main Zone Zone 2, if applies
CAZ Test WRT Outside _____ Pa _____ Pa
Baseline (WRT Outside, fans off) _____ Pa _____ Pa
NET CAZ Pressure (subtract baseline from CAZ WRT outside) _____ Pa _____ Pa

Duct Leakage (fill out one sticker per duct system)

Measured Leakage Pass : Yes [] No []
Cond. Floor Area System Serves (ft²) _____
Test Method: [] Leakage to Outside or [] Total Leakage
Target CFM _____ [] CFM@50Pa or [] CFM@25Pa
Fan Pressure _____ Pa Test Results _____ CFM _____
Ring (check one) [] Open [] 1 [] 2 [] 3
Duct Blaster Location _____
Pressure Tap Location _____

Blower Door Results

Test Results _____ CFM Volume _____ ACH 50 _____
Test Pressure _____ Pa Baseline _____ Pa
Ring (check one) [] Open [] 1 [] 2 [] 3
Target CFM _____ [] CFM@50Pa or [] CFM@25Pa

Northwest REM/Rate Modeling Guidelines

Raters certifying homes in the Northwest were required to follow these modeling guidelines in conjunction with region-specific modeling software.

Modeling Guidelines for Northwest REM/Rate™

Updated July 1, 2015

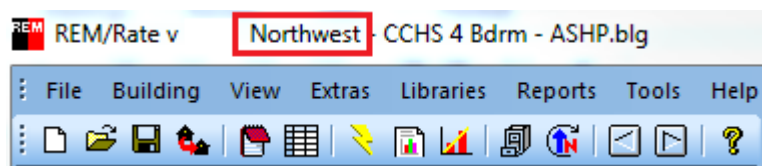
The Northwest ENERGY STAR® Homes program, in collaboration with NORESKO, has developed a Northwest version of the REM/Rate™ modeling software that has been adjusted for closer alignment with regionally accepted values. To qualify for Northwest ENERGY STAR certification, all single-family homes must be modeled in Northwest REM/Rate. While builders have some flexibility in constructing their homes to meet the program requirements, Raters must follow specific guidelines for data entry in addition to the standard REM/Rate protocol. This ensures that certified homes meet or exceed the minimum performance requirements of the Northwest ENERGY STAR Reference Home for your state.

How does the Northwest version of REM/Rate differ from the national version?

- The Northwest version compares the modeled home with state-specific reference homes
- Foundations have been restricted to the following four types:
 - Slab
 - Enclosed Crawlspace
 - Conditioned Basement
 - Unconditioned Basement
- Window areas locked with preset minimums
- Shading factor inputs for windows locked to preset values
- Ground contact, duct leakage, infiltration and heat pump behavior models adjusted for closer alignment with regionally accepted values based on calibrated software
- Tankless water heaters de-rated for consistency with DOE/RTF recommendations
- DHW gal./day consumption overridden to regionally accepted values
- HRV/ERV efficiency input set to align with regionally accepted values

What guidelines must Raters follow when modeling their homes?

- The Northwest version of REM/Rate must be used to determine compliance for Northwest ENERGY STAR Home certification. The version can be identified by checking for "Northwest" at the header of the software following the version of REM/Rate.



Contact your Provider to request the necessary files that modify the national version of REM/Rate to the Northwest version.

- Raters must use libraries approved by Northwest ENERGY STAR Homes (Exhibit 1). These libraries can be obtained from your Provider, along with detailed instructions for updating your copy of Northwest REM/Rate to include the library.

Exhibit 1: Approved Libraries

Effective Date 8/1/2013
Energy Trust of Oregon custom libraries
Washington State University Energy Program libraries

- Raters must run a Compliance Report to determine whether or not the home meets or exceeds performance of the Reference Home, based on annual energy consumption. Builders and Raters may generate and use other REM/*Rate* reports, but these reports will not suffice to demonstrate compliance for Northwest ENERGY STAR Home certification.
- When modeling homes in Northwest REM/*Rate*, the following protocols must be followed:
 - Slab insulation must meet or exceed the state-specific Reference Home prescriptive requirements, and must be modeled **at** the specified levels (see Exhibit 1 of the [Northwest ENERGY STAR Single-Family Homes Requirements](#)). No trade-offs are available for this measure.
 - Foundations are limited to four types (see below). Therefore, conditioned crawlspaces should be modeled as conditioned basements. Add the characteristics to the foundation wall, slab and house volume. For REM/*Rate* to assign the thermal boundary and provide an accurate model, a slab entry must be provided, even if not present in the home. If a mechanical exhaust ventilation strategy is used, this should be added to the whole-house ventilation rate, duration and fan wattage.
 - Enter window areas accurate to the rated home.
 - Duct tightness must meet or exceed Northwest ENERGY STAR Homes program standards (found in both the Single-Family Homes Requirements and Rater Field Checklist). No tradeoffs are available for duct leakage in excess of:
 - If testing at CFM25: .04 x floor area served by system or 40 CFM, whichever is greater.
 - If testing at CFM50: .06 x floor area served by system or 75 CFM, whichever is greater.

REM/*Rate* requires the Rater to enter a value for Leakage to Outside for energy calculations. Unless a ductless heat pump (or other ductless heating system) is installed, Leakage to Outside should never be set to zero. The "Exemption- No Test Required" box should not be checked. Use the following inputs depending on where the ducts are located:

- If ducts or portion of ducts are located outside of conditioned space, tested Leakage to Outside values should be entered. If only Total Leakage was tested, this number should be substituted for Leakage to Outside.
- If ducts and equipment are located within conditioned space (max 5% of the lineal feet of the duct system located outside of pressure and thermal boundary), tested Leakage to Outside values should be entered. If no testing was done, enter .015 x floor area served at CFM50 as this matches the Reference Home assumed value.
- Air infiltration must be entered at the state-specific Reference Home value (see Exhibit 1 of the Northwest ENERGY STAR Single-Family Homes Requirements). Until further notice, no trade-offs are available for this measure.



- Unless an HRV or ERV is used, ventilation systems must be entered as program default type "Exhaust Only." Integrated supply air ventilation systems must also be modeled as an "Exhaust Only" system. For these systems, actual ventilation of the home should be set up to satisfy Northwest ENERGY STAR Homes (at minimum) requirements, but modeled according to the following:
 - Enter flow *Rate* as if the run time was constant or ASHRAE 62.2 2010 continuous design ventilation rate.
 - *Hours/Day* should be set to 24.
 - Multiply the air handler wattage by 0.146 to determine *Fan Watts*. This is based off the assumption of a 3.5 hour/day run time, spread out over a 24 hour period. Note this value accounts for run times outside of normal heating and cooling cycles.
- Balanced ventilation systems must be modeled with Apparent Sensible Effectiveness (ASE), Rate, Hours/Day and Fan watts accurate to the equipment being used.
- Air source heat pumps shall be modeled within the range of 8 to 10 HSPF.
- Ductless heat pumps shall be modeled according to the following:
 - If supplemental electric unit heaters or zone heaters exist in the home, the Rater should model an air-source heat pump and enter the minimum HSPF specified in the state-specific Reference Home (see Exhibit 1 of the [Northwest ENERGY STAR Single-Family Homes Requirements](#)). The Rater should not alter the "compressor capacities" listed in either of the approved libraries, or REM/*Rate's* default values for "electric resistance backup capacity" (strip heat). Ductwork shall be assigned to the system, but enter the ducts and system as inside the conditioned space and set "leakage to outside" to zero.
 - If **no** supplemental electric unit heaters or zone heaters exist in the home, the Rater should model an air-source heat pump and enter the HSPF of the system, which should be no greater than 10. The REM/*Rate* default value for "electric resistance backup capacity" (strip heat) should be set to "0". A duct system entry can be omitted. REM/*Rate* may indicate a warning that no ducts are present, but this will not affect Northwest ENERGY STAR Homes compliance.
- If a **ducted** mini-split is installed and no supplemental electric unit heaters or zone heaters exist in the home, the Rater should model an air-source heat pump and enter the HSPF of the system, which should be no greater than 10. The REM/*Rate* default value for "electric resistance backup capacity" (strip heat) should be set to "0". Ductwork shall be assigned to the system, following the protocol for duct tightness outlined above.
- REM/*Rate* default values shall be used for appliance consumption for clothes washers, dryers and refrigerators unless appliances are installed in the home at the final inspection that are more efficient than the default models. The actual consumption of the dishwasher should be entered as this appliance should be in place at the final inspection. Dishwashers must be ENERGY STAR qualified.

For questions, contact Northwest ENERGY STAR Homes by email at trevor.frick@clearesult.com or by phone at **1-503-548-1628**.

Northwest Transition to National Program Frequently Asked Questions

This document answered questions about the transition from Northwest-specific to national program requirements.



ENERGY STAR Certified Homes, Version 3 / 3.1 Northwest Transition to National Program Frequently Asked Questions

October 01, 2016



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**If your question is not addressed in the document below, Please contact
energystarhomes@energystar.gov.**



Section 1: Rater Discretion

Raters are often in the position to make judgment calls with builders and trades on particular program requirements and best practices. The EPA provides this guidance:

The Rater must review all items on the Rater checklists. Raters are expected to use their experience and discretion to verify that the overall intent of each inspection checklist item has been met (i.e., identifying major defects that undermine the intent of the checklist item versus identifying minor defects that the Rater may deem acceptable). The column titled “N/A,” which denotes items that are “not applicable,” should be used when the checklist item is not present in the home or conflicts with local requirements.

Questions to consider when making determinations:

- What is the intent of this requirement or checklist item? Is the builder/trade using techniques and materials that either meet the requirement or negate the need for this requirement?
- Does the installed method/measure sacrifice comfort, energy use, building durability, indoor air quality or safety?
- Can we determine that this requirement is covered by code, insurance requirement, or other third-party program requirement?
- Can the builder/trade provide documentation of this alternative compliance?

Raters are the most knowledgeable agents to determine whether a builder is meeting the intent and concepts behind ENERGY STAR® Homes. If Raters feels strongly about an allowance or deviation from program requirements, they should work with their Providers, track decisions, and record the logic and calculations that helped them arrive at their conclusion. This information should be retained in the Rater’s records along with the checklists.

In the event that a Rater is not able to determine whether an item is consistent with the intent (e.g., an alternative method of meeting a checklist requirement has been proposed), then the Rater shall consult their Provider. If the Provider also cannot make this determination, then the Rater or Provider shall report the issue to EPA prior to project completion at: energystarhomes@energystar.gov and will typically receive an initial response within 10 business days. If EPA believes the current program requirements are sufficiently clear to determine whether the intent has been met, then this guidance will be provided to the partner and enforced beginning with the house in question. In contrast, if EPA believes the program requirements require revisions to make the intent clear, then this guidance will be provided to the partner but only enforced for homes permitted after a specified transition period after the release of the revised program requirements, typically 60 days in length.

Section 2: Partner Participation

1) Should I be a Rater, Rating Field Inspector (RFI), Verifier or Performance Tester for ENERGY STAR Home certification?

To perform an energy rating on a home, you must be a credentialed RESNET Rater (as of January 1, 2015).

To perform field verification and performance testing, you must be a RESNET Rater or Rating Field Inspector (RFI) (as of July 1, 2015).

2) Do Northwest builders and Raters need to become ENERGY STAR Partners? How do I sign up?



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Yes. Builders and Raters working on homes seeking whole-home ENERGY STAR certification must become partners with the national ENERGY STAR Certified Homes program.

Complete an ENERGY STAR Partner Agreement by visiting [this page](#). There is no cost to become an ENERGY STAR partner. Partner Agreement requirements vary by partner type. Contact the national ENERGY STAR Certified Homes program with additional partner agreement questions at energystarhomes@energystar.gov.

3) What is required of HVAC contractors to participate in the program and perform work on ENERGY STAR homes?

Contractors who install heating, ventilation and air conditioning (HVAC) systems in homes which are being built to ENERGY STAR specifications in Idaho, Montana, Oregon and Washington must become credentialed through a national HVAC Quality Installation and Oversight Organization (H-QUITO). H-QUITOs are the independent, third-party oversight organizations that provide the required training and oversight activities for HVAC contractors working on homes seeking ENERGY STAR certification. There are two national credentialing programs:

- ACCA (Air Conditioning Contractors of America)
- Advanced Energy

Credentialing requirements, costs and participation guidelines are specified by each H-QUITO. More information about HVAC Contractor credentialing and contact information for the H-QUITOs can be found [HERE](#).

Homes with a split air conditioner, unitary air conditioner, air-source heat pump, or water-source (i.e., geothermal) heat pump up to 65 kBtuh with a forced-air distribution system (i.e., ducts) or a furnace up to 225 kBtuh with ducts are required to use a credentialed HVAC contractor. All other permutations of equipment (e.g., boilers, mini-split / multi-split systems, zonal systems) and distribution systems are exempt and, therefore, do not require a credentialed contractor.

Section 3: Certification Requirements

1) What certification specifications do I use?

For all homes permitted prior to January 1, 2016: Use either the Northwest ENERGY STAR Single-Family Requirements or Multifamily Builder Option Packages (BOPs) for Northwest ENERGY STAR Homes certification.

For single-family homes permitted on / after January 1, 2016: Use the national program Version 3 or 3.1 specifications with ENERGY STAR HERS Index Target Procedure for national ENERGY STAR homes certification. ENERGY STAR versions are specific to each state. Review the national program's [Northwest landing page](#) for more information.

For multifamily homes permitted on / after January 1, 2016: BOTH the Northwest Multifamily BOP AND the national program single-family certification requirements will be accepted until December 31, 2016, at which point only the national program single-family certification will result in an ENERGY STAR label.

2) What are the minimum requirements? Can I make tradeoffs?



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For single-family homes permitted prior to January 1, 2016 and seeking Northwest ENERGY STAR Homes certification: While builders have some flexibility in constructing their homes, certain minimums must be met. Minimums are in place for items such as duct leakage, heat pump efficiencies, ventilation, slab insulation, programmable thermostats, certain appliances, and hot water pipe insulation. Revision 08 Checklists are required and specific modeling guidelines must be followed using Northwest REM/Rate™. For more information, please see the Modeling Guidelines for Northwest REM/Rate and Northwest ENERGY STAR Single-Family Homes Requirements.

For single-family homes permitted on / after January 1, 2016: All homes must meet the national ENERGY STAR Program Requirements and HERS Index Target procedure.

For multifamily homes permitted in 2015 or 2016 and using the Northwest Multifamily BOP: All prescriptive BOP minimums must be met. The only substitutions allowed within the Multifamily BOP are thermal envelope trade-offs. You can propose an overall building UA trade-off as long as the measure being traded doesn't represent 33 percent or more of the building's surface area. A UA trade-off allows the builder to reduce R-value in one assembly while increasing the R-value elsewhere in the building envelope such that the total building thermal envelope UA (U-factor multiplied by assembly area) is less than or equal to the total UA when built according to the Multifamily BOP. In order to demonstrate compliance, a Rater must complete a UA calculation according to the ASHRAE Handbook of Fundamentals or in allowance with local code UA compliance workbooks.

3) What is the difference between ENERGY STAR “Versions” and “Revisions”?

In general, Versions affect minimum construction and energy use requirements to stay ahead of code. Revisions are made in between Versions to clarify, simplify, and improve the program with the aim of improving compliance and usability.

What is Revision 08?

Driven by partner feedback, Revision 08 modified the mandatory checklists and was developed to improve the ENERGY STAR Certified Homes program in the following ways:

1. Streamline 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 certification with a HERS rating.

4) What field checklists should I use?

The national Revision 08 checklists should be used for Northwest ENERGY STAR homes permitted on / after July 1, 2015 and may be used for national ENERGY STAR homes permitted on / after January 1, 2016. Although the national program will not be enforcing the use of Revision 08 checklists until July 1, 2016, Raters and builders are encouraged to use Revision 08 checklists for national certification as soon as possible to acclimate to these newer checklist requirements. The Revision 08 checklists are:

- Rater Design Review and Rater Field checklists
 - Note: Design review is completed while home is in design or construction phase, field checklist is completed while home is in construction phase
- HVAC Design Report
 - Note: Only Sections 1 (Design Overview) and 2 (Whole-House Mechanical Ventilation Design) of the HVAC Design Report are required for boilers, mini-split / multi-split systems, electric resistance, or other zonal systems.
- HVAC Commissioning Checklist



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- Note: The HVAC Commissioning Checklist is not required for boilers, mini-split / multi-split systems, electric resistance, or other zonal systems.
- Water Management System Builder requirements
 - Note: The Water Management System Builder requirements document is no longer a checklist to complete. It should, however, be reviewed with builders on each home or multifamily building, as builders are responsible for ensuring that the details have been met.

Review the checklists under the “Complete Mandatory Measures” section of this page.

5) Do multifamily buildings have different checklist requirements?

The Revision 08 checklists are used for both site-built homes and multifamily dwelling units. Just like the site-built program, each dwelling unit must either be individually inspected or inspected as part of a sampled group using RESNET’s sampling protocol. With regards to documentation, one document can be used to represent multiple dwelling units, as long as:

1. The information on the document is applicable to all dwelling units represented by that document, and,
2. Each dwelling unit can be tied back to a specific document.

For example, a Rater may choose to individually inspect each dwelling unit but retain only the following documents (**this is currently the method used for the Northwest ENERGY STAR Homes certification**):

- Rater Field Checklist: one per floor
- HVAC Design Report: one per system
- Rater Design Review Checklist: one per system
- HVAC Commissioning Checklist: one per system

This would be acceptable as long as the two conditions above are met. If, for example, a homeowner complaint arises on a specific unit, the Rater would need to be able to identify which verification document applies to that specific unit and that the document reflects the characteristics of that specific dwelling unit.

6) What if the project is receiving a Northwest utility incentive?

All homes permitted prior to January 1, 2016 and seeking Northwest ENERGY STAR Homes certification must be entered into the Axis database by December 31st, 2016 for certification and utility incentive review.

For homes permitted on / after January 1, 2016 that are following national program specifications and receiving utility incentives:

- Build and verify home using single-family national specifications or Northwest Multifamily BOP
- For single-family: Run a NW Compliance Report in Northwest REM/Rate to determine whether the home meets or beats energy consumption of the Northwest Reference Homes
- Run a national HERS Index Target report in national REM/Rate to determine national program compliance and certification (single-family or non-BOP multifamily)
- Enter the home data into the Axis database for utility tracking and review (both single-family and multifamily)

At this time, many Northwest utilities are only able to claim savings and issue incentives on the regional single-family Northwest Reference Homes or multifamily BOP compliance procedure used prior to shifting to national specs and HERS Index. Homes must be entered into Axis by December 31, 2016 and individual



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utilities or Providers may also ask Raters to upload NW Compliance Reports based on the state-specific Northwest Reference Homes.

7) What is the timeline for completing Northwest ENERGY STAR Homes?

Homes permitted prior to January 1, 2016 (Northwest specs): Homes must be entered into Axis Database by 12/31/2016. Please check with the Better Built NW team or local utility program if projects are expected to continue beyond March 31st, 2017.

Homes permitted on / after January 1, 2016 (national specs) AND receiving Northwest utility incentives and savings: Homes must be entered into Axis Database by 12/31/2016. Please check with local utility program if projects are expected to continue beyond October 1st, 2017.

Homes permitted on / after January 1, 2016 (national specs) and **not** receiving utility incentives: The Axis database or Provider reporting methodology may be used and there are no construction / certification due dates. In all cases, check with your Provider for the final word on certification / labeling requirements and timelines.

8) What should I do with ENERGY STAR labels and homeowner certificates?

Labels: The blue ENERGY STAR labels are necessary for both Northwest and national certifications. These labels should be placed in homes on the breaker box for homeowners and real estate professionals to review.

- If the home is processed in the Axis database for Northwest program certification, labels may be generated via Axis by going to Reports -> Printing -> ENERGY STAR Labels.
- If the home is processed outside of the Axis database for national program certification, check with your Provider.

Homeowner certificates: Homeowner certificates are also required and must be provided to the homeowner, builder, and / or Real Estate professional for verification of the homes certification.

- If the home is processed in the Axis database for Northwest program certification, homeowner certificates may be generated via Axis by going to Reports -> Printing -> Home Certificates. **The Northwest branded certificate may only be used on Northwest program certifications.** A national program certificate is not available at this time in Axis.

The Axis database also offers general Program Reports that may be generated by visiting the Home Detail Page of the home record, clicking on the program name, then clicking the Report button on the program.

- If the home is processed outside of the Axis database for national program certification, check with your Provider.

9) What are the certification requirements for accessory dwelling units (ADUs) and attached apartments where the primary residence is an ENERGY STAR certified single-family home? What are the insulation requirements of attached apartments and ADUs?

Only dwelling units are eligible to be certified, where a dwelling unit is defined, per the 2009 IECC, as “a single unit that provides complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation.”



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EPA recommends, but does not require, that multiple dwelling units that are constructed on a single property (e.g., condos, townhomes, a dwelling unit above a detached garage that is on the same property as a single-family home) all be certified.

10) How are multifamily buildings defined for ENERGY STAR Homes?

The EPA uses the same certification process for both single family detached homes, as well as all multifamily projects that meet the following criteria:

- Dwelling units in any multifamily building with 4 units or fewer; OR
- Dwelling units in multifamily buildings with 3 stories or fewer above-grade; OR
- Dwelling units in multifamily buildings with 4 or 5 stories above-grade that have their own heating, cooling, and hot water systems, separate from other units, and where dwelling units occupy 80% or more of the occupiable square footage of the building. When evaluating mixed-use buildings for eligibility, exclude commercial / retail space when assessing whether the 80% threshold has been met.

11) How does the sampling method work for verifying single-family homes or multifamily units?

For Northwest and national single-family homes, as well as multifamily homes following the national single-family certification process, Raters should complete a Sampling Agreement with their RESNET Sampling Approved Provider and follow the sampling protocol in Chapter 6 of the RESNET Standards .

For multifamily projects following the Northwest Multifamily BOP, Raters and Providers should complete a Northwest Multifamily BOP Sampling Agreement, which can be found on the EPA's Northwest landing page.

Assuming this Sampling Agreement is in place, Raters and builders may follow the same RESNET sampling standards for single-family and multifamily units with one significant difference for multifamily: instead of sample inspecting an individual home or batching groups of homes, a Rater would sample inspect an individual unit or batch of units within a development. If a new development or multifamily complex will be subject to sampling, notify your Provider in advance.

If the builder is seeking incentives, the Rater should confirm with the local utility or incentive program that sampled homes will qualify. In many cases, anywhere up to 100 percent inspection and testing may be required.

12) When did the requirement for third-party duct testing (Raters instead of HVAC contractors) go into effect?

Since the January 1, 2016 transition to home certification under the national program. Version 3 and 3.1 homes, regardless of Revision 07 or Revision 08 checklists, require Raters or RFIs to perform testing and commissioning.

Historically, HVAC contractors in the Northwest have tested their own ducts. However, third-party verification is a key component of the ENERGY STAR program, and third-party testing of duct leakage has been specifically required for the national program since its inception in the 1990s. Therefore, with proper planning, EPA anticipates that this requirement will also be viable in the Northwest, and will deliver even greater assurance that the duct system is performing as designed.

13) Under Revision 08, will duct testing be defined as CFM@50 or change to the national metric of CFM@25?

Revision 08 calls for the national metric of CFM@25pa. Please use this definition in all cases except where CFM@50pa is tied to a Northwest utility incentive in your area. In those cases, CFM@25 may be translated to CFM@50 manually or by manometer functionality.



Section 4: HVAC Systems

1) What HVAC design software is recommended?

HVAC designers may use ACCA approved Manual J or alternate H-QUITO approved software as long as it can provide all the necessary information to complete the HVAC Design Report.

2) For HVAC systems designed using software, is it acceptable for a builder or the Rater to enter the HVAC contractor's actual layout into the HVAC design software?

Yes. Ultimately, the designer who completes the HVAC Design Report is responsible for the accuracy of the design. However, the project superintendent, builder, or Rater may assist with this process, under the direction of the designer, by entering the duct layout into the HVAC design software.

3) Does a forced-air duct system need to be designed using HVAC design software? What is the minimum amount of duct design that the contractor must perform with design software?

Room heating and cooling loads must be designed using a methodology approved by your H-QUITO. A contractor may perform manual hand calculations and use an air duct calculator for duct design as long as it meets the intent and requirements set forth by the H-QUITO. Even if the contractor does not want to use a specific software program to design the HVAC system, the contractor must still use an approved methodology per the HVAC Design Report – Unabridged ACCA Manual J v8, 2013 ASHRAE Fundamentals, or other methodology mandated by the Authority Having Jurisdiction.

4) What are the spot ventilation requirements for fans located in an ENERGY STAR certified home?

The program requires that all full bathroom and kitchen spot ventilation fans used within the home be ENERGY STAR rated, with the following requirements:

- Bathroom exhaust fans used in half bathrooms are not required to meet any flow or sound rating specifications, nor do they need to be ENERGY STAR rated
- Kitchen exhaust fans must meet ASHRAE 62.2 or local code requirements, whichever is more stringent. ASHRAE 62.2 requires kitchen exhaust fans to be rated at a minimum of 100 CFM, and recommended to be 3 sones or less. Kitchen exhaust fans that exhaust 400 CFM of air or greater are exempt from any sone rating requirements, but they must be able to operate at multiple speeds via a switch. In some states, if the kitchen fan is equal to or greater than 400 CFM, additional make-up air is required. Please consult your building/energy/mechanical codes for clarification.
- To view the ENERGY STAR Certified Fans list, [CLICK HERE](#)

5) For ducts inside the thermal boundary and air barrier, do the register boots have to be sealed to the interior air barrier? For instance, where ducts are feeding ceiling registers into first-floor rooms, do those register boots have to be sealed to the sheetrock?

It depends. The ENERGY STAR program does not require air sealing boots to sheetrock connections in ducts-inside scenarios where these duct terminations are located in interstitial space within the thermal and pressure boundary of the home if the home is receiving both duct leakage to exterior and building tightness testing at final. Air sealing at these locations would be considered a best practice technique, and although advisable, it is not strictly necessary in order to meet the checklist requirements. However, if the home's duct leakage is tested at rough inspection and will not need to be tested again at final, prescriptively sealing around boots is required.

6) My builder installed a ground source heat pump (GSHP) system on his home. The manufacturer of the system does not recommend commissioning on the unit, stating that the system is factory charged



with refrigerant. In addition, the manufacturer provides their own startup forms, which do not have the same requirements as CC&S or the HVAC Commissioning Checklist. Are these forms acceptable to meet ENERGY STAR Homes requirements?

The HVAC contractor should check with their H-QUITO to determine if the manufacturer's start-up forms qualify the system. Any manufacturer forms must be included in documentation to the Rater / RFI.

7) Is an HVAC Design Report required for homes / units with radiant or zonal-only heating strategies?

Homes / units that are zonally heated are currently exempt by the national ENERGY STAR homes program from needing anything other than Sections 1 (Design Overview) and 2 (Whole-House Mechanical Ventilation Design) of the HVAC Design Report completed.

8) Do ductless heat pumps require commissioning?

Contractors installing ductless heat pumps are not required to complete the HVAC Commissioning Checklist. Of course, ductless heat pumps should always be installed according to the manufacturer's specifications.

Section 5: Framing & Insulation

1) Are raised heel trusses required?

Raised heel trusses or any alternative method of framing and insulation that achieves R-21 at the inside edge of the top plates is permitted. While a raised heel truss is one option that increases the R-value at the top plate, other options include cantilevered trusses with wider overhangs, framing with a rafter plate, utilizing spray foam or rigid foam at the edge, or moving the attic ventilation up to the roof deck to eliminate baffles and increase space for insulation.

2) Can rigid foam be used on the attic side of knee wall framing members without the addition of fiberglass or other insulation in contact with drywall?

Rigid foam can be used on the attic side of the framing members. If installed complete and continuous, the foam serves as both the air and the thermal barrier. However, there are some considerations when choosing this strategy:

- Ensure local fire and smoke codes are met.
- Complete air sealing. The program recommends sealing joints and gaps with two-part spray foam, fire-rated caulk or mastic.

3) Is rigid backing required in a wall assembly located below grade when the assembly is spaced 2 inches off the concrete wall?

Rigid backing is required in these scenarios for the following reasons:

- Potential for air leakage through that area. Even though it is on a below-grade wall, that cavity is most likely still connected to some kind of air leakage pathway. This can result in air entering the insulation.
- Potential for convective looping. While most of that wall will have a reduced potential for convective looping due to the temperature differential being less than what it would be if the wall was above grade, that potential will not be completely eliminated.
- The rigid backing on one side will keep the insulation from slumping over time.

4) What are the minimum requirements for air sealing the rim / band area between floors for homes with ducts inside?



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While recommended but not required, the following should be followed when air sealing rim / band joist areas:

- Caulk or glue the bottom edge of the rim and joists to the top plate
- Caulk or glue the subfloor to the top edge of the rim and joists
- Caulk the vertical joints in rim material

The best practice approach is to seal the entire rim with spray foam. Another option is to “picture frame” the floor bays with caulk or foam.

Section 6: Water Heating

1) Are heat pump water heaters (HPWHs) allowed inside the conditioned space?

The ENERGY STAR program does not currently dictate where a HPWH must be installed. An unvented HPWH may be a poor idea in climates with low latent heat loads as it may lead directly to comfort issues.

2) Are demand recirculation pumps required?

On-demand recirculation is a part of many states adoption of the 2015 ICC codes. If the state the home is being built in is migrating to 2015 codes, then the builder and Rater are responsible for learning what amendments may be included that address energy efficiency, comfort, IAQ, safety, and building durability issues.

Section 7: Multifamily Homes

1) What are the blower door testing protocols for attached townhomes and multifamily buildings?

All blower door testing procedures shall be conducted according to RESNET standards. Attached townhomes shall be tested one unit at a time. Multifamily dwelling units being certified under the National ENERGY STAR label must also be tested individually.

2) Do I need to verify common areas in a multifamily building?

For Northwest ENERGY STAR Homes only, if the common areas are conditioned, they must meet the specifications of the ENERGY STAR program requirements and Revision 08 checklists. Unconditioned common areas such as stairwells and breezeways do not need to be verified. However, any conditioned space adjacent to these areas must be verified to meet the thermal and air barrier requirements of ENERGY STAR Homes.

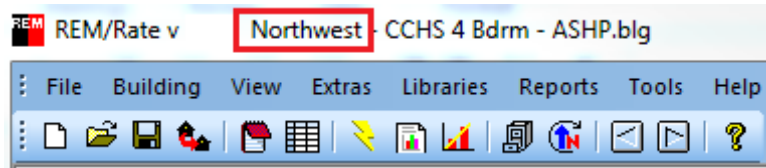
Section 8: REM/Rate™ Modeling

1) What is the correct version of REM/Rate? How do I know I have the correct version?

For single-family homes permitted prior to January 1, 2016 receiving Northwest ENERGY STAR Homes certification: The Northwest ENERGY STAR Homes program worked with NORESO to develop a Northwest version of REM/Rate that is adjusted for closer alignment with regionally accepted values and utility savings. The Northwest version is labeled “Northwest” in the heading bar when the program is open. Northwest REM/Rate version 14.6.1 should be used for Northwest ENERGY STAR certification.



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For single-family homes permitted on / after January 1, 2016 receiving national certification or for multifamily homes permitted on / after January 1, 2016 following the national single-family certification process: Homes being certified under the national program should use the most current, and accepted, version of national REM/Rate to complete the HERS Index target procedure.

For single-family homes permitted on / after January 1, 2016 receiving utility incentives AND national certification: a Northwest Compliance Report must be run in NW REM/Rate version 14.6.1 to determine Northwest utility compliance in addition to running the ENERGY STAR Certified Homes report in national REM/Rate for national program compliance.

- Note, not all REM/Rate versions are fully forward and backward compatible, meaning if the .blg file is created in the most current and accepted version of REM/Rate, it may not open in earlier versions of REM/Rate. It is highly recommended to start and complete the energy model and regional compliance reports in the oldest required version of REM/Rate for your various regional or utility programs before saving the file (Northwest REM/Rate version 14.6.1 for Northwest ENERGY STAR or utility incentivized projects), then opening it in a more current version to run national HERs or ENERGY STAR homes reports.

2) How do I obtain the Northwest version of REM/Rate?

The Northwest version of REM/Rate can be obtained by replacing the ratek.ini file located within the directory of the national version of REM/Rate. Please contact your Provider to request this file.

3) Do I need to use approved REM/Rate libraries?

To model homes for Northwest ENERGY STAR Homes certification compliance or for Northwest utility incentives, Raters must use approved libraries in Northwest REM/Rate. The approved libraries are titled "Energy Trust of Oregon" and "Washington State University Energy Program." Please contact your Provider for the approved library files.

Follow RESNET guidelines for creating libraries in national REM/Rate for the national ENERGY STAR program or other programs / reports.

4) Is it OK to add library items in Northwest REM/Rate?

Yes, under certain circumstances. The approved libraries will cover the majority of entries into Northwest REM/Rate. However, if the Rater cannot find an entry in the approved Northwest REM/Rate libraries that matches a certain building assembly or piece of equipment, the Rater may create one. Please check with your Provider on guidance for creating new library entries.

5) I have questions about modeling a home in Northwest REM/Rate. Where should I look for guidance?

The first resource to check is the Northwest REM/Rate Modeling Guidelines. Modeling guidance can also be found through the help menu in Northwest REM/Rate, from your Provider, or from the REM/Rate website.

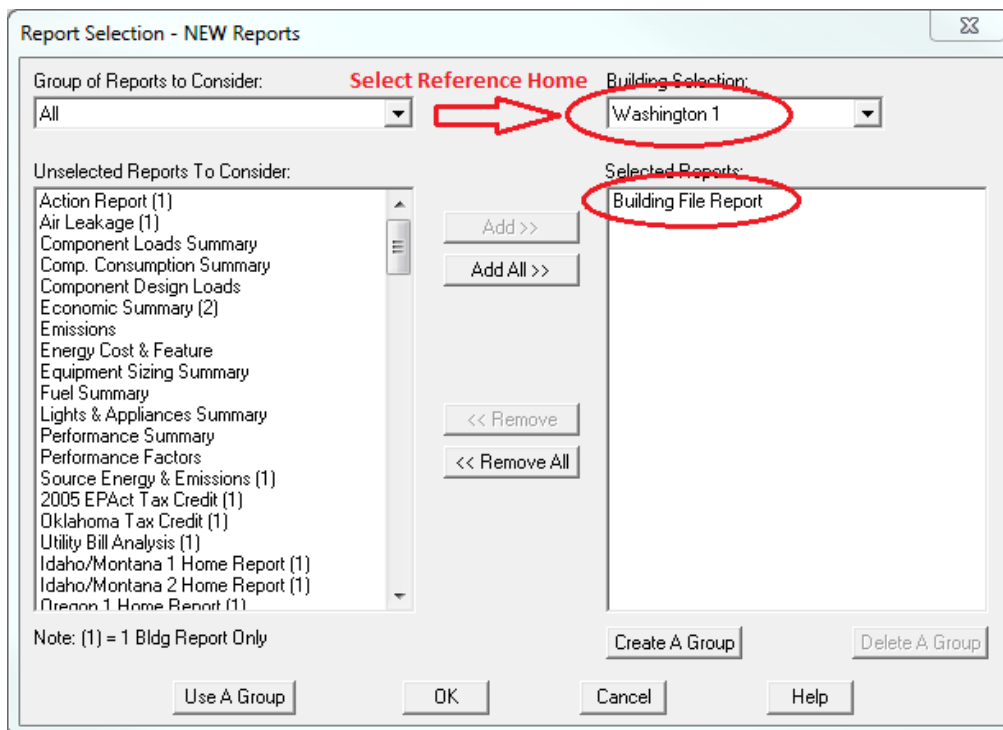
6) How do I know which measures are included in the Northwest Reference Home?



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The Northwest ENERGY STAR Single-Family Homes Requirements lists the Northwest Reference Home measures.

Another way to view the Northwest Reference Home measures is to run a Building File Report in Northwest REM/Rate. Click on “Reports,” then on “New Views/Selected Reports...”, then select “Building File Report” so it appears in the “Selected Reports” box. In the “Building Selection” box, select the appropriate Reference Home and click “OK.” This will show all REM/Rate entries used for your home and the Northwest Reference Home.



7) Will Northwest REM/Rate automatically select the appropriate Northwest Reference Home to compare to your home? Is it based on the climate zone or address of the project?

The state-specific Northwest Reference Homes are used statewide regardless of the climate zone or geographical location within that particular state. For example, the Washington Reference Home would be the same for a home built in Olympia (CZ 4) or Yakima (CZ 5). When running a Northwest Compliance Report, Northwest REM/Rate will not automatically select the appropriate Northwest Reference Home for your home, the user must manually select this when running the report.

8) What are Northwest Compliance Reports, and how do they determine if my project qualifies?

For a home to be certified under the Northwest ENERGY STAR Homes program or receive Northwest utility incentives, the home must meet or beat the annual fuel consumption of the Northwest Reference Home measured in MMBTU/yr. To run a Northwest Compliance Report, open your completed project in Northwest REM/Rate and click on “Reports,” then on “New Views/Selected Reports...” Select the appropriate Reference Home to compare the project to and click “OK.” Check the report to determine how total energy usage compares. The Northwest Compliance reports are:



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- Idaho / Montana 1 Home Report -1 indicates a home primarily heated with gas or a heat pump
- Idaho / Montana 2 Home Report -2 indicates a home primarily heated with electric resistance
- Oregon 1 Home Report
- Oregon 2 Home Report
- Washington 1 Old Home Report -for use on homes permitted prior to 12/1/14
- Washington 1 New Home Report -for use on homes permitted on or after 12/1/14
- Washington 2 Home Report

9) Can actual infiltration rates be entered into Northwest REM/Rate when modeling a home?

Not for Northwest ENERGY STAR homes. Until further notice, Raters must enter the infiltration rate of the Northwest Reference Home and not the actual tested rate of the home.

Modeling protocols for other programs and certifications may require the entry of actual infiltration rates. For example, if a national HERS Index Score is also being generated for the home, the .blg file must be opened and modeled in national REM/Rate, and actual infiltration values should be used.

10) Does the Northwest version of REM/Rate calculate a HERS Index Score that is approved by RESNET?

Not at this time. Currently, the .blg file must be opened in the national version of REM/Rate to obtain an approved HERS Index score.

11) When I run a Northwest Compliance Report in Northwest REM/Rate, it flags windows as not meeting the specification. What should I do?



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The home must still meet window U-value and SHGC requirements set forth by your state's energy code. However, it is OK for the Northwest Compliance Report to state that windows do not meet U-value or SHGC requirements. This will not prevent certification of the home as long as the home as a whole meets or beats the annual fuel usage as demonstrated in your state-specific Northwest Compliance Report.

12) Are there plans to create a ductless heat pump (DHP) selection in the “Mechanical Equipment” tab of REM/Rate?

NORESO is aware of the need of a DHP entry in REM/Rate and plans to create one in the future.

Specific instructions for modeling DHPs in Northwest REM/Rate are available in the Modeling Guidelines for Northwest REM/Rate for homes receiving Northwest ENERGY STAR Homes certification or utility incentives.

Section 9: Axis database

1) What are the partner roles in the Axis database?

RESNET Raters are provided accounts to enter home data.

RESNET Providers are provided accounts to review, certify, and QA home data.

Northwest Utilities are provided accounts to review home data.

Builders are not provided with Axis accounts at this time. Builders must be registered ENERGY STAR partners with the national program.

HVAC Contractors are not provided with Axis accounts at this time. HVAC Contractors must be registered with a national H-QUITO.

2) How do partners gain access to Axis?

Raters must be RESNET credentialed and partnered with a RESNET Provider participating in Northwest programs to be provided access to Axis.

Utilities should contact the Northwest program team.

3) How do I get started in the Axis database?

After gaining access to Axis, visit the Support Portal Rater or Provider forums for step-by-step guides and videos covering topics such as company associations, the home file creation and certification process, and steps to connect your REM/Rate software to submit .blg files. You may also contact Pivotal Energy Solutions or the Northwest program team for support and training.

4) What Axis database program should I use for home entry and certification?

For homes permitted on / after July 1, 2015 seeking Northwest ENERGY STAR Homes certification and for homes permitted on / after January 1, 2016 seeking national certification with northwest utility incentives - use either of the following database programs:

- NW ENERGY STAR Version 3, natl Rev 08: Single Family Performance
- NW ENERGY STAR Version 3, natl Rev 08: Multifamily



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- Incentivized national certifications must be entered into the Axis database by 12/31/2016 under these Northwest programs for proper utility visibility
- Axis completion deadlines are TBD

Homes permitted on / after January 1, 2016 (national specs) and not receiving utility incentives: The Axis database or unique Provider methodology may be used. Check with your Provider for non-incentivized national program certification / labeling process and procedures.

5) What should I do if my ENERGY STAR builder is not in Axis or I get an error message about the builder profile attached to the home in Axis?

All builders participating in either the Northwest or national program must be registered as a builder partner with the national ENERGY STAR program. Each night, Axis pulls in Northwest builder profile updates from the national ENERGY STAR program and all northwest builders are associated to the NEEA Sponsor account in Axis. The builder profile attached to the home must be an ENERGY STAR builder profile and also be associated to NEEA in Axis. If you need assistance resolving builder issues in the database, create an Axis support ticket by emailing support@pivotalenergysolutions.com.

6) What should I do if my HVAC contractor is not marked as H-QUITO approved in Axis or I get an error message about the HVAC contractor attached to the home in Axis?

All homes permitted on / after July 1, 2015 must have a national H-QUITO approved HVAC contractor attached to the home file in Axis for certification (both Northwest certification and national certification with utility incentives). The NEEA sponsor account and Northwest program team review ACCA and Advanced Energy credentialed contractor lists and mark the HVAC Company profile as H-QUITO credentialed in Axis as their credential is confirmed. If you need assistance resolving HVAC contractor issues in the database, create an Axis support ticket by emailing support@pivotalenergysolutions.com.

7) Do I need to connect my Northwest REM/Rate software program to the Axis database?

Yes. A one-time process must be performed to connect your Northwest REM/Rate account to the Axis database. Please visit the Axis support site and use REM/Rate Database Connector (MySQL ODBC) Setup for Export to Axis for instructions.

8) Should I upload the Northwest Compliance Report to Axis?

The Northwest Compliance Report results from Northwest REM/Rate are needed to determine whether the home meets or beats the fuel usage of the Northwest Reference Home for homes permitted prior to January 1, 2016 and receiving Northwest ENERGY STAR certification. This Northwest Compliance Report is also necessary for homes permitted on / after January 1, 2016 and receiving utility incentives while following national certification guidelines. It is recommended that Raters upload Northwest Compliance Reports to Axis; however, Provider discretion determines whether uploading the report is required.

9) Should I upload other documents to the home files in Axis?

It is recommended Raters upload other documents (e.g. checklists, photos) to homes in Axis; however, it is ultimately the discretion of Providers or local utility programs to require uploading documents.

10) Does Axis allow home entry and certification via sampling?



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Yes. There is a Sampling Control Center in Axis for Raters and Providers to enter, manage, and certify sample sets for both single-family and multifamily homes.

11) Who do I contact for additional Axis database questions or support?

Review the Axis Support Portal for training videos and other support articles. If the question or issue is not addressed in the Support Portal resources, file a support ticket by emailing support@pivotalenergysolutions.com or call the Axis support hotline at 800-980-AXIS (800-980-2947).