Northwest ENERGY STAR® Homes Montana & Idaho Program Requirements[1]

Single Family Homes
Effective Date 1/1/2011

NWBOP 1
Natural Gas Fired Furnaces & Electric Heat Pumps

Northwest ENERGY STAR Builder Option Package: Natural Gas Furnace & Electric Heat Pumps

Heating and Cooling Equipment

- Heating equipment shall be ENERGY STAR qualified AND meet the following applicable efficiency levels:
  - ≥ 90 AFUE gas furnace **OR;**
  - 9.0 HSPF / 14.5 SEER / 12 EER air-source heat pump, ENERGY STAR qualified with electric backup[2] **OR;**
  - Ground-source heat pump, any product type, ENERGY STAR qualified
- Cooling equipment shall meet the following applicable efficiency levels:
  - ≥ 13 SEER AC, **OR**; Heat pump (see above)

Envelope, Windows, & Doors

- Insulation levels for walls must achieve an average U≤0.051 (advanced framing, SIP, double wall, exterior foam, etc.); **AND** achieve Grade I installation per RESNET standards.[3]
- Ceiling:
  - R-38 with ≥ R-21 at ceiling edge (Climate Zone 5)
  - R-49 with ≥ R-21 at ceiling edge (Climate Zone 6)
- Floor: R-30
- Slab:
  - R-10, 4 ft; R-15 for heated slab (MT)
  - R-10, 2 ft perimeter (ID)
- Infiltration rates shall be ≤ 4 ACH50.
- Windows shall have a U-Value of ≤ 0.30.
- Skylights shall have a U-Value of 0.50.[4,5,6]
- Doors shall be ENERGY STAR qualified.[4]
- Homes with total window-to-floor area greater than 15% shall have adjusted U-values or SHGC's as outlined in footnote 5.

Water Heating

- DHW equipment shall meet the following efficiency requirements:

Natural Gas	≤ 60 gal	0.61
	> 60 gal	0.60
Electric	≤ 70 gal	0.93
	> 70 gal	0.92

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+
Max Standby Losses	930	960	980	1010	1030	1060	1080

Ventilation, Ductwork & Thermostat

- Programmable thermostat shall be installed unless thermostat controls a zone with electric radiant heat, for which a manual adjustable thermostat is allowed.
- Supply ducts in unconditioned attics shall have insulation ≥ R-8; all other ducts in unconditioned space shall have insulation ≥ R-6.
- Total duct leakage shall be ≤ 0.06 CFM50 per ft^2 of conditioned floor area **OR** 75 CFM50 Total, whichever is greater.[7]
- Whole house mechanical ventilation shall be accomplished in accordance with local codes **OR** ASHRAE Standard 62.2, whichever is more stringent.

Lighting & Appliances

- Where refrigerators, dishwashers, ceiling fans, and exhaust fans[8] are installed, products shall be ENERGY STAR qualified.
- ENERGY STAR qualified CFLs or pin-based lighting in 80% of fixtures[9], **OR** use any efficient light source and lighting design to reach 0.72 Watts per square foot, while meeting requirements outlined in footnote 10.
- 1. 75 gpm showerheads, 1.5 gpm kitchen faucet, 1.0 gpm bathroom faucets.[11]

Northwest ENERGY STAR® Homes Montana & Idaho Program Requirements[1]

Single Family Homes
Effective Date 1/1/2011

NWBOP 1
Natural Gas Fired Furnaces & Electric Heat Pumps

Qualifying Homes

Single-family homes in Montana and Idaho may earn the ENERGY STAR label using the following ENERGY STAR Prescriptive Path or the Performance Path. Note that compliance with these guidelines is not intended to imply compliance with all local code requirements that may be applicable to the home to be built. Northwest ENERGY STAR's definition of "single family" homes extends to multiplex units separated fully from ground-to roof (i.e., townhouses and condominiums).

ENERGY STAR Prescriptive Path

The prescriptive path provides a single set of measures that can be used to construct an ENERGY STAR qualified home. Follow these steps to use the prescriptive path:

1. First, assess eligibility to follow the prescriptive path by comparing the conditioned floor area (CFA) of the home to be built, as calculated using RESNET Standards, to the CFA of the Benchmark Home as specified in Exhibit 1. The CFA of the Benchmark Home shall be determined based on the number of bedrooms in the home to be built.
2. Build the home using all requirements of the ENERGY STAR Reference Design, Exhibit 1, and the Mandatory Requirements for All Qualified Homes, Exhibit 2.
3. Using a Verifier[12], ensure that all requirements have been met including the Mandatory Requirements for All Qualified Homes, Exhibit 2.

Exhibit 1: Benchmark Home

Bedrooms in Home to be Built	1	2	3	4	5	6	7	8
Conditioned Floor Area Benchmark Home	1,000	1,600	2,200	2,800	3,400	4,000	4,600	5,200

The average-size home with a specific number of bedrooms is termed the "Benchmark Home". The conditioned floor area of a Benchmark Home (CFA Benchmark Home) is determined by selecting the appropriate value from Exhibit 1. For homes with more than 8 bedrooms, the CFA Benchmark Home shall be determined by multiplying 600 sq. ft. times the total number of bedrooms and adding 400 sq. ft.

Example: CFA Benchmark Home for a 10 bedroom home = (600 sq. ft. x 10) + 400 sq. ft. = 6,400 sq. ft.

A bedroom is defined by RESNET as a room or space 70 sq. ft. or greater size, with egress window and closet, used or intended to be used for sleeping. A "den", "library", or "home office" with a closet, egress window, and 70 sq. ft. or greater size or other similar rooms shall count as a bedroom, but living rooms and foyers shall not. Bedrooms and floor area in basements shall not be counted for the purpose of determining a home's Benchmark Home Size and Size Adjustment Factor if at least half of the basement's wall area is below grade. To determine whether at least half of the basement wall area is below grade, use the exterior wall area from the basement floor to the bottom of the basement ceiling framing (e.g., the bottom of the joists for the floor above). Exclude the area of all common walls in the basement.

An egress window, as defined in IRC section R310, shall refer to any operable window that provides for a means of escape and access for rescue in the event of an emergency. The egress window definition has been summarized for convenience. The egress window shall:

- have a sill height of not more than 44 inches above the floor; AND
- have a minimum net clear opening of 5.7 sq. ft.; AND
- have a minimum net clear opening height of 24 in.; AND
- have a minimum net clear opening width of 20 in.; AND
- be operational from the inside of the room without the use of keys, tools or special knowledge

Mandatory Requirements for All ENERGY STAR Qualified Homes

Effective on January 1, 2012, all ENERGY STAR Qualified New Homes must meet the requirements of the checklists in Exhibit 2. The Water Management System Builder checklist is not required for homes that also qualify for Indoor airPLUS.[12]

Exhibit 2: Mandatory Requirements for All Qualified Homes, Effective Date 1/1/2012

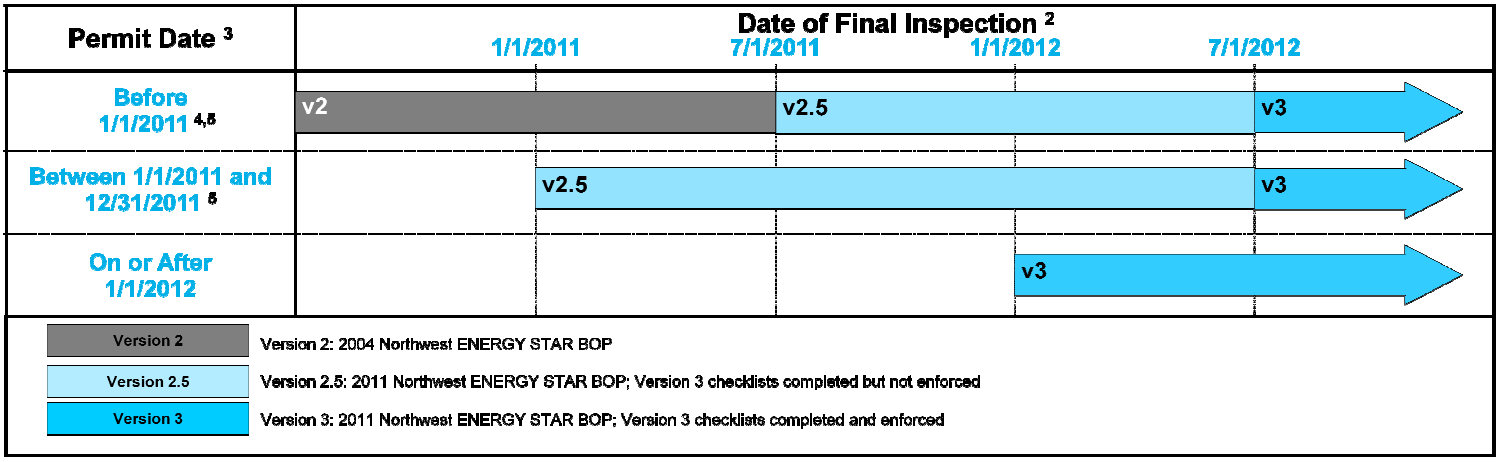
Checklist
Thermal Enclosure Checklist
HVAC System Quality Installation Checklist (Heating), HVAC System Quality Installation Checklist (Cooling)
Water Management System Checklist[12]

Northwest ENERGY STAR® Homes Reference Design Notes

Effective Date

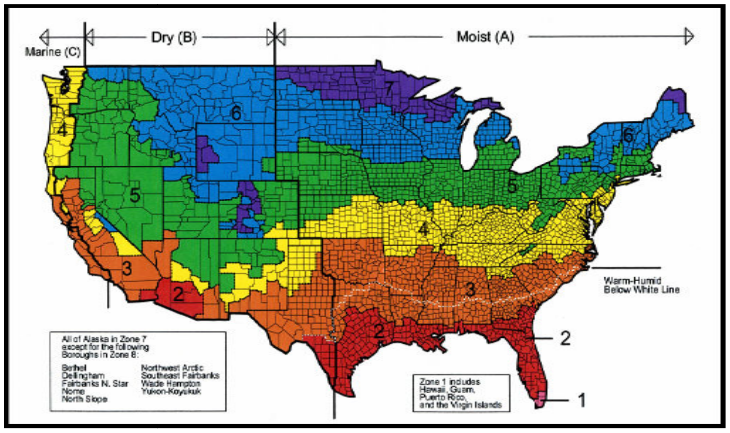
Use Exhibit 3, below, to determine the version of the guidelines that may be used to earn the ENERGY STAR certification for New Homes.

Exhibit 3: 2011 Northwest ENERGY STAR Specifications Timeline for Single-Family Homes[1]



1. Northwest ENERGY STAR's definition of "single-family" homes extends to multiplex units separated fully from ground to roof (i.e. townhouses and condominiums).
2. The date of the final inspection for the home (i.e., the date at which all of the field inspections are complete for the home and data is entered into the Northwest ENERGY STAR database, not necessarily the date when the label is issued).
3. The rater may define the 'permit date' as either the date that the permit was issued, the date of the contract on the home or the date the home was initiated in the Northwest ENERGY STAR database.
4. All low-income projects in Idaho, Montana, and Washington that are financed through low-income housing agencies may earn the ENERGY STAR under the last iteration of the guidelines, Version 2, until January 1, 2013 as long as the application for funding for those homes was received by the low-income housing agency before January 1, 2011, and the housing project includes at least one unit reserved for low-income tenants. If the application for funding is received between January 1, 2011 and December 31, 2011, then the homes must earn the ENERGY STAR under the Version 2.5 guidelines if completed before January 1, 2012, and under the Version 3 guidelines if completed after January 1, 2012. If the application for funding is received on or after January 1, 2012 then the homes must earn the ENERGY STAR under the Version 3 guidelines.
5. Homes can be qualified under the Version 2.5 guidelines in advance of the dates above at the discretion of builders and their raters.

The following map is shown to depict Climate Zone boundaries. It is for illustrative purposes only and is based on 2009 IECC Figure 301.1.



Northwest ENERGY STAR® Homes Reference Design Notes

1. Where requirements of the local codes, manufacturers' installation instructions, engineering documents, or regional ENERGY STAR programs overlap with the requirements of these guidelines, EPA offers the following guidance:

    a. In cases where the overlapping requirements exceed the ENERGY STAR guidelines, these overlapping requirements shall be met;

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

2. Homes with heat pumps in Climate Zones 5 and 6 shall have an HSPF ≥ 9.0, both of which exceed the ENERGY STAR minimum of 8.2 HSPF.

3. Insulation levels in a home shall meet or exceed local codes **OR** those specified in the 2009 IECC (ID), depending on state requirements. Compliance in Montana can be determined by meeting component insulation requirements in **Table 1: Montana Residential Building Energy Code** (Below) or using RES*check*™ with 2009 IECC. Compliance in Idaho can be referenced in **2009 IECC Table 402.1.1** (below), using U-factor alternatives in Table 402.1.3, or using a total UA alternative, as described in Section 402.1.4 of the 2009 IECC.

Table 1: Montana Residential Building Energy Code

Component	Insulation or Efficiency Level
Ceiling	R-49 [zone 6] or 38 [zone 5]
Exterior Wall	R-21 or R13+R5 CI [Continuous Insulation]
Mass Wall	R19/15
Floor	R-30
Basement Wall	R-19/15 CI
Slab Perimeter	R-10, F from top edge for 4 ft. R-15 for in-floor heated slab.
Crawlspace Wall	R-19/10
Window U Factor	U - .33

2009 IECC Table 402.1.1

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE	FLOOR R-VALUE	BASEMENT WALL R-VALUE	SLAB R-VALUE & DEPTH	CRAWL SPACE WALL R-VALUE
1	1.20	0.75	0.30	30	13	3 / 4	13	0	0	0
2	0.65	0.75	0.30	30	13	4 / 6	13	0	0	0
3	0.50	0.65	0.30	30	13	5 / 8	19	5 / 13	0	5 / 13
4 except Marine	0.35	0.60	NR	38	13	5 / 10	19	10 / 13	10, 2ft	10 / 13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5	13 / 17	30	10 / 13	10, 2 ft	10 / 13
6	0.35	0.60	NR	49	20 or 13+5	15 / 19	30	15 / 19	10, 4 ft	10 / 13
7 and 8	0.35	0.60	NR	49	21	19 / 21	38	15 / 19	10, 4 ft	10 / 13

Note that the U-factor for steel-frame envelope assemblies shall be calculated using the ASHRAE zone method or a method providing equivalent results, and not a series-parallel path calculation method. Additionally, reduction of ceiling insulation in space-constrained roof/ceiling assemblies shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. Finally, slab insulation shall extend to the top of the slab to provide a complete thermal break.

Insulation shall be verified by a Rater 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 only if the rigid insulation sheathing meets or exceeds the following levels: R-3 in Climate Zones 1 to 3; R-6 in Zones 4 to 6; and R-10 in Zones 7 and 8.

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 15 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" thick. Also, note that the U-value and SHGC for doors apply to the whole door, not just to the glazing portion.

5. All decorative glass and skylight window areas count toward the total window area to above-grade conditioned floor area (WFA) ratio. For homes that have a WFA ratio >15%, an improved window U-Value is required and is determined by:

   Improved U-Value = [0.15 / WFA] x [ENERGY STAR U-Value]

   where the ENERGY STAR U-value is the maximum allowable U-Value in the Northwest Energy Star Homes Reference Design. For example, for a home built with a WFA of 20%:

   Improved U-Value = [0.15 / .20] x .30

   Improved U-Value = .23

   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 Checklist. Conditioned, attached garages shall not be included in the CFA.

6. Up to 0.75% WFA may be used for decorative glass that does not meet ENERGY STAR requirements. For example, a home with total above-grade conditioned floor area of 2,000 sq. ft. may have up to 15 sq. ft. (0.75% of 2,000) of decorative glass.

7. Certification of a duct system under the Northwest ENERGY STAR Homes program is consistent with the Performance Tested Comfort Systems® (PTCS®) specifications and requires that one or more of these tests are performed on each system. A PTCS certified technician shall complete the testing and certification process and shall provide documentation of the test results showing compliance with Northwest ENERGY STAR Home standards to the Program Verifier. For certification, the measured CFM50 shall not exceed 0.06 x floor area served by the system (in square feet) or 75 CFM50, whichever is greater. The factory-supplied air handler shall be in place at the time of the test. Exception 1: if the air handler is located completely within conditioned space intended for occupancy, it is not required to be in place during the test. Exception 2: If the air handler is located in unconditioned space, it is not required to be in place during the test, 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. Exception 3: If ducts are located within the conditioned space, up to five percent (5%) of the linear feet of the supply duct system and up to five percent (5%) of the linear feet of the return duct system may be located outside the thermal and/or air barriers of the house or in exterior cavities of the house.

8. All exhaust fans shall be ENERGY STAR qualified, except in half bathrooms. A half bathroom is any bathroom that does not contain a bathtub, shower, spa, or similar source of moisture.

9. 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 60% 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.

10. 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 home's lighting power density. The following guidelines must also be met:
    - Every room in the home 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 home square footage includes the garage square footage.
    - The Watts per Square Foot Tool must be submitted at time of verification.

11. Faucet aerators are permitted. An exception to 1.0 gpm faucets in bathrooms: 1.5gpm faucets may be used if showerheads are 1.5gpm or below.

12. The term "Verifier" or "Rater" refers to the person completing the third-party inspections required for qualification. This party may be a certified Home Energy Rater, BOP Inspector, or an equivalent designation that has been qualified by the State Certifying Organization.

13. A completed and signed Indoor airPLUS Verification Checklist may be submitted in lieu of the Water Management System checklists. Indoor airPLUS is a complimentary EPA label recognizing new homes equipped with a comprehensive set of Indoor Air Quality (IAQ) features. Indoor airPLUS verification can be completed by a Rater during the ENERGY STAR verification process. For more information, see www.epa.gov/indoorairplus.

Northwest ENERGY STAR® Homes Montana & Idaho Program Requirements[1]

Single Family Homes

Effective Date 1/1/2011

NWBOP 2
Zonal Electric, Propane & Oil Furnaces

Northwest ENERGY STAR Builder Option Package 2: Zonal Electric and Propane/Oil Furnace

Heating and Cooling Equipment

- Propane or oil furnace must be ENERGY STAR qualified AND meet the following applicable efficiency levels:
  - ≥ 80 AFUE propane furnace, **OR;**
  - ≥ 80 AFUE oil furnace, **OR;**
  - ≥ 80 AFUE boiler
- Cooling equipment shall meet the following applicable efficiency levels:
  - ≥ 13 SEER AC

Envelope, Windows, & Doors

- Insulation levels for walls must achieve an average U≤0.043 (advanced framing, SIP, double wall, exterior foam, etc.); **AND** achieve Grade I installation per RESNET standards.[2]
- Below-Grade Wall: R-19.
- Ceiling:
  - R-38 with ≥ R-21 at ceiling edge (Climate Zone 5)
  - R-49 with ≥ R-21 at ceiling edge (Climate Zone 6)
- Floors: R-38.
- Slab: R-10 full slab.
- Infiltration rates shall be ≤ 2.5 ACH50.
- Windows shall have a U-Value of ≤ 0.30.
- Skylights shall have a U-Value of 0.50, with the maximum area limited to 5% of heated floor space. [3,4,5]
- Doors shall be ENERGY STAR qualified.[3]
- Homes with total window-to-floor area greater than 15% shall have adjusted U-values or SHGC's as outlined in footnote 4.

Water Heating

- DHW equipment shall meet the following efficiency requirements:

Natural Gas	≤ 60 gal	0.62
	> 60 gal	0.61
Electric	≤ 70 gal	0.93
	> 70 gal	0.92

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+
Max Standby Losses	900	930	950	980	1000	1030	1050

Ventilation, Ductwork & Thermostat

- Programmable thermostat shall be installed unless thermostat controls a zone with electric radiant heat, for which a manual adjustable thermostat is allowed.
- All ducts in unconditioned space should be insulated to ≥ R-8.
- Total duct leakage shall be ≤ 0.06 CFM50 per ft^2 of conditioned floor area **OR** 75 CFM50 Total, whichever is greater.[6]
- Whole house mechanical ventilation must be ENERGY STAR qualified ERV or HRV, installed in accordance with local codes **OR** ASHRAE Standard 62.2, whichever is more stringent.[7]

Lighting & Appliances

- Where refrigerators, dishwashers, ceiling fans, and exhaust fans[8] are installed, products shall be ENERGY STAR qualified.
- ENERGY STAR qualified CFLs or pin-based lighting in 90% of fixtures[9], **OR** use any efficient light source and lighting design to reach 0.6 Watts per square foot, while meeting requirements outlined in footnote 10.
- 1. 75 gpm showerheads, 1.5 gpm kitchen faucet, 1.0 gpm bathroom faucets [11]

Northwest ENERGY STAR® Homes Montana & Idaho Program Requirements[1]

Single Family Homes

Effective Date 1/1/2011

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Zonal Electric, Propane & Oil Furnaces

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The prescriptive path provides a single set of measures that can be used to construct an ENERGY STAR qualified home. Follow these steps to use the prescriptive path:

1. First, assess eligibility to follow the prescriptive path by comparing the conditioned floor area (CFA) of the home to be built, as calculated using RESNET Standards, to the CFA of the Benchmark Home as specified in Exhibit 1. The CFA of the Benchmark Home shall be determined based on the number of bedrooms in the home to be built.

2. Build the home using all requirements of the ENERGY STAR Reference Design, Exhibit 1, and the Mandatory Requirements for All Qualified Homes, Exhibit 2.

3. Using a Verifier[12], ensure that all requirements have been met including the Mandatory Requirements for All Qualified Homes, Exhibit 2.

Exhibit 1: Benchmark Home

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Example: CFA Benchmark Home for a 10 bedroom home = (600 sq. ft. x 10) + 400 sq. ft. = 6,400 sq. ft.

A bedroom is defined by RESNET as a room or space 70 sq. ft. or greater size, with egress window and closet, used or intended to be used for sleeping. A "den", "library", or "home office" with a closet, egress window, and 70 sq. ft. or greater size or other similar rooms shall count as a bedroom, but living rooms and foyers shall not. Bedrooms and floor area in basements shall not be counted for the purpose of determining a home's Benchmark Home Size and Size Adjustment Factor if at least half of the basement's wall area is below grade.To determine whether at least half of the basement wall area is below grade, use the exterior wall area from the basement floor to the bottom of the basement ceiling framing (e.g., the bottom of the joists for the floor above). Exclude the area of all common walls in the basement.

An egress window, as defined in IRC section R310, shall refer to any operable window that provides for a means of escape and access for rescue in the event of an emergency. The egress window definition has been summarized for convenience. The egress window shall:

- have a sill height of not more than 44 inches above the floor; AND
- have a minimum net clear opening of 5.7 sq. ft.; AND
- have a minimum net clear opening height of 24 in.; AND
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- be operational from the inside of the room without the use of keys, tools or special knowledge

Mandatory Requirements for All ENERGY STAR Qualified Homes

Effective on January 1, 2012, all ENERGY STAR Qualified New Homes must meet the requirements of the checklists in Exhibit 2. The Water Management System Builder checklist is not required for homes that also qualify for Indoor airPLUS.[13]

Exhibit 2: Mandatory Requirements for All Qualified Homes, Effective Date 1/1/2012

Checklist
Thermal Enclosure Checklist
HVAC System Quality Installation Checklist (Heating), HVAC System Quality Installation Checklist (Cooling)
Water Management System Checklist[12]

Northwest ENERGY STAR® Homes Reference Design Notes

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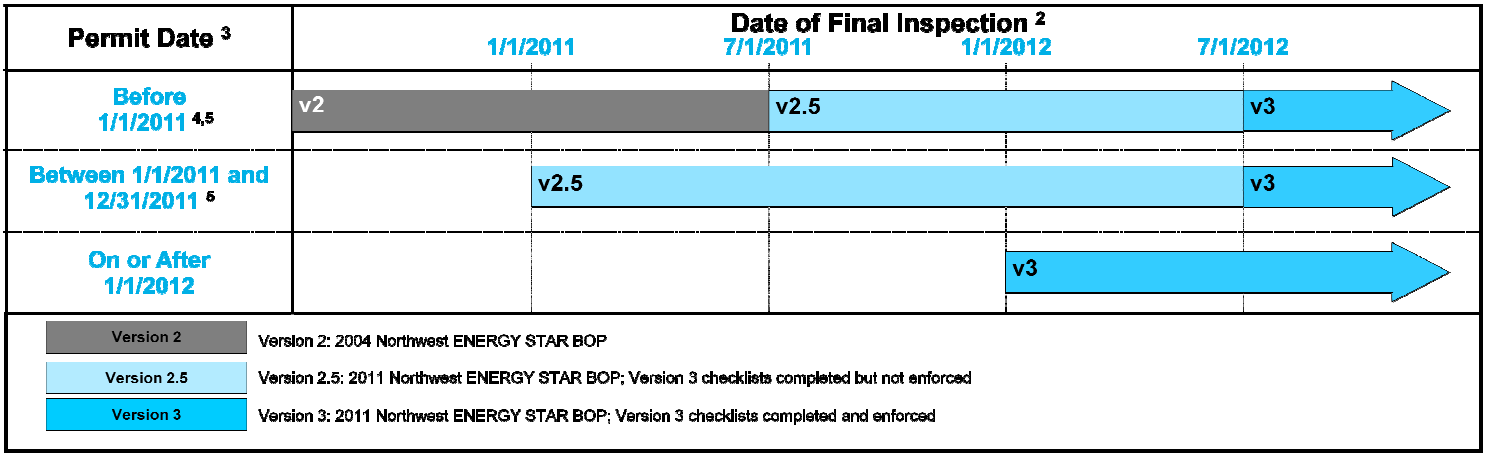

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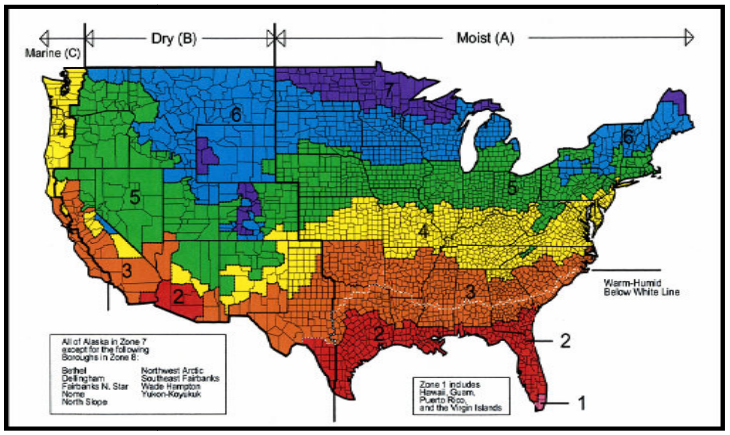

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    b. In cases where overlapping requirements conflict with a requirement of these ENERGY STAR guidelines (e.g., slab insulation is prohibited to allow visual access for termite inspections), then the conflicting requirement within these guidelines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

2. Note that the U-factor for steel-frame envelope assemblies shall be calculated using the ASHRAE zone method or a method providing equivalent results, and not a series-parallel path calculation method. Additionally, reduction of ceiling insulation in space-constrained roof/ceiling assemblies shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. Finally, slab insulation shall extend to the top of the slab to provide a complete thermal break.

    Insulation shall be verified by a Rater 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 only if the rigid insulation sheathing meets or exceeds the following levels: R-3 in Climate Zones 1 to 3; R-6 in Zones 4 to 6; and R-10 in Zones 7 and 8.

3. All windows, doors, and skylights shall meet ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows except fenestration utilized as part of a passive solar design. These windows shall be facing within 15 degrees of true south and directly coupled to thermal storage mass that has a heat capacity > 20 btu/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" thick. Also, note that the U-value and SHGC for doors apply to the whole door, not just to the glazing portion.

4. All decorative glass and skylight window areas count toward the total window area to above-grade conditioned floor area (WFA) ratio. For homes that have a WFA ratio >15%, an improved window U-Value is required and is determined by:

    Improved U-Value = [0.15 / WFA] x [ENERGY STAR U-Value]

    where the ENERGY STAR U-value is the maximum allowable U-Value in the Northwest Energy Star Homes Reference Design. For example, for a home built with a WFA of 20%:

    Improved U-Value = [0.15 / .20] x .30

    Improved U-Value = .23

    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 Checklist. Conditioned, attached garages shall not be included in the CFA.

5. Up to 0.75% WFA may be used for decorative glass that does not meet ENERGY STAR requirements. For example, a home with total above-grade conditioned floor area of 2,000 sq. ft. may have up to 15 sq. ft. (0.75% of 2,000) of decorative glass.

6. Certification of a duct system under the Northwest ENERGY STAR Homes program is consistent with the Performance Tested Comfort Systems® (PTCS®) specifications and requires that one or more of these tests are performed on each system. A PTCS certified technician shall complete the testing and certification process and shall provide documentation of the test results showing compliance with Northwest ENERGY STAR Home standards to the Program Verifier. For certification, the measured CFM50 shall not exceed 0.06 x floor area served by the system (in square feet) or 75 CFM50, whichever is greater. The factory-supplied air handler shall be in place at the time of the test. Exception 1: if the air handler is located completely within conditioned space intended for occupancy, it is not required to be in place during the test. Exception 2: If the air handler is located in unconditioned space, it is not required to be in place during the test, 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. Exception 3: If ducts are located within the conditioned space, up to five percent (5%) of the linear feet of the supply duct system and up to five percent (5%) of the linear feet of the return duct system may be located outside the thermal and/or air barriers of the house or in exterior cavities of the house.

7. 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 70% 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.

- 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. 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 supported.

8. All exhaust fans shall be ENERGY STAR qualified, except in half bathrooms. A half bathroom is any bathroom that does not contain a bathtub, shower, spa, or similar source of moisture.

9. 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.

10. 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 home's lighting power density. The following guidelines must also be met:
    - Every room in the home 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 home square footage includes the garage square footage.
    - The Watts per Square Foot Tool must be submitted at time of verification.

11. Faucet aerators are permitted. An exception to 1.0 gpm faucets in bathrooms: 1.5gpm faucets may be used if showerheads are 1.5gpm or below.

12. The term "Verifier" or "Rater" refers to the person completing the third-party inspections required for qualification. This party may be a certified Home Energy Rater, BOP Inspector, or an equivalent designation that has been qualified by the State Certifying Organization.

13. A completed and signed Indoor airPLUS Verification Checklist may be submitted in lieu of the Water Management System checklists. Indoor airPLUS is a complimentary EPA label recognizing new homes equipped with a comprehensive set of Indoor Air Quality (IAQ) features. Indoor airPLUS verification can be completed by a Rater during the ENERGY STAR verification process. For more information, see www.epa.gov/indoorairplus.