

		DUCTWORK INSTALLATION	GOOD	BAD
		Critical Details	✓	✗
		Items in bold are a requirement of the Northwest ENERGY STAR Homes Program		
PRE-CHECK	1	All chases are capped prior to installing wiring or duct work		
	2	All floor system cavities between conditioned areas and unconditioned areas (e.g. attics/garages, bonus rooms, cantilevers) are separated by blocking and air sealed		
	3	Work site is broom cleaned and all safety precautions are taken prior to beginning work		
	*	Installer's Name _____ Date _____ <small>print name signature</small>		
SELF-CHECK	1	All HVAC supply and return ducts, air handlers, and plenums inside and outside the heated space are sealed at all joints and corners, including prefabricated joints, with approved mastic. Tape of any kind is not allowed except for use on cabinet doors		
	2	All new duct joints, plenum drives, metal joints to include all slips and drives are mechanically fastened with screws. Flexible ducts are attached at the inner liner using nylon/plastic/Panduit® straps tightened with a manufacturer approved tool. Tape of any kind is not a mechanical fastener		
	3	All ducts, plenums, and supply/return boots outside the conditioned space (including exterior wall cavities) are completely insulated to an installed value of at least R-8. Duct insulation is mechanically fastened with straps.		
	4	Unlined building cavities are not used as ducts.		
	5	Conditioned rooms without dedicated returns (except baths, laundry, and closets) have jump ducts, transfer grills, or door undercuts to provide return air paths		
	6	Branch out runs shall be a minimum of 6" in diameter except to bathrooms		
	7	Ducts shall be cut to proper length and supported in such a manner to prevent air flow constriction		
	8	Flexible duct (including spot ventilation) is supported at least every 4 feet and has no bends greater than 90°		
	9	All HVAC penetrations to exterior/unconditioned space (e.g. chases, shafts, refrigerant lines, etc) are air sealed with foam, caulk, or mastic. NO fibrous insulation is used to fill holes		
	10	Spot ventilation (exhaust) ductwork terminates to daylight		
	11	Work site is broom cleaned after work is complete		

Installer Name _____ Date _____
print name signature

Builder Name _____ Builder's Job #: _____

This Verification form should be signed and filled out by the Installer. Signing this form certifies that all Critical Details are correct and are as designated.



NORTHWEST ENERGY STAR® HOMES CERTIFICATION REQUIREMENTS

NWBOP1 Natural Gas Fired Furnaces & Electric Heat Pumps
NWBOP2 Zonal Electric, Propane & Oil Furnaces

Single Family Homes

Builder Option Packages (BOP's) are a prescriptive method for labeling new homes ENERGY STAR. All requirements of the NWBOP shall be met in order to qualify a home for ENERGY STAR Homes Northwest certification and verification by an ENERGY STAR Homes Northwest Verifier. **HIGHLIGHTED** sections pertain to the Critical Details on the opposite side of this sheet.

		NWBOP 1	NWBOP 2																	
Insulation																				
Ceiling		R-38	R-38	Flat or vaulted.																
Wall		R-21	R-21 + 2.5 sheath	BOP 1: R-19 is optional with advanced framing techniques. BOP 2: R-21 is optional with advanced framing techniques.																
Floors Over Unconditioned Space		R-30	R-30	Insulation in floor joist cavity. Perimeter insulation is not allowed.																
Slab Floors	Unheated	R-10 Perimeter	R-10 Perimeter	Applies to all concrete slab floors above or below grade. R-5 thermal breaks at slab edge. Perimeter insulation shall be installed for a distance of 2 feet vertical, horizontal, or combined distance. In areas east of the Cascade mountains, 4 feet is recommended.																
	Heated Radiant	R-10 Full Slab	R-10 Full Slab																	
Basement Wall		R-19	R-19	Below grade walls can extend up to 24 inches above grade.																
Windows & Doors																				
Glazing	Windows	U-0.35	U-0.30	NFRC rated.																
	Skylights	U-0.50	U-0.50	Skylight area shall not exceed 5% of heated floor area.																
	Max. Glazing Area	21% of Heated Floor Area	21% of Heated Floor Area	Combined window and skylight area. Up to 1% of heated floor area exempt.																
Doors		R-5	R-5	One door up to 28 ft ² exempt.																
Ducts																				
Insulation		R-8	R-8	Ducts inside the heated space exempt.																
Sealing		Mastic	Mastic	Tapes not allowed.																
Max. Leakage		<0.06 CFM per ft ² 1.1.3. OR 75 CFM Total @ 50 Pa	<0.06 CFM per ft ² OR 75 CFM Total @50Pa	All forced air heating and cooling system ducts shall be installed according to ENERGY STAR Homes Northwest Specifications for sizing and leakage. Performance testing is required.																
Ventilation & Air sealing																				
Ventilation System		Exhaust Ventilation	Central ventilation with 70% heat recovery	BOP 1 ONLY: Local code requirements are deemed to satisfy this requirement.																
Envelope tightness		7.0 ACH @ 50 Pa	2.5 ACH @ 50 Pa	BOP 1: Local code requirements for air sealing are deemed to satisfy this requirement. BOP 2: Air tightness in this path must be verified by blower door test before certification is granted.																
Heating & Cooling Equipment																				
Gas Furnace		90 AFUE		Installed according to ENERGY STAR Homes Northwest Specifications for sizing, controls, airflow and refrigerant charge (if applicable). Performance testing is required.																
Heat Pump		8.5 HSPF / SEER 13																		
Air Conditioner		SEER 13																		
Propane or Oil Furnace		≥ 80 AFUE																		
Water Heating																				
Natural Gas	≤ 60 gal	EF ≥ 0.61	EF ≥ 0.61	BOP 1 ONLY: Gas commercial tank water heaters may be used if they have standby losses that do not exceed the following (btu/hr):																
	> 60 gal	EF ≥ 0.60	EF ≥ 0.60																	
Electric	≤ 70 gal	EF ≥ 0.93	EF ≥ 0.93																	
	> 70 gal	EF ≥ 0.92																		
<table border="1" style="float: right; border-collapse: collapse; text-align: center;"> <tr> <td>Gallons</td> <td>70-74</td> <td>75-79</td> <td>80-84</td> <td>85-89</td> <td>90-94</td> <td>95-99</td> <td>100+</td> </tr> <tr> <td>Max Standby Loss</td> <td>930</td> <td>960</td> <td>980</td> <td>1010</td> <td>1030</td> <td>1060</td> <td>1080</td> </tr> </table>					Gallons	70-74	75-79	80-84	85-89	90-94	95-99	100+	Max Standby Loss	930	960	980	1010	1030	1060	1080
Gallons	70-74	75-79	80-84	85-89	90-94	95-99	100+													
Max Standby Loss	930	960	980	1010	1030	1060	1080													
Appliances & Lighting																				
Appliances		ENERGY STAR Qualified	ENERGY STAR Qualified	Applies to built-in appliances only.																
Lighting		ENERGY STAR Qualified	ENERGY STAR Qualified	A minimum of 50% of sockets to be either ENERGY STAR bulbs, fixtures, or both.																