



## Northwest ENERGY STAR<sup>®</sup> Homes Approved Technical Compliance Option Summary

| TCO: Un-vented Crawlspace (Idaho & Montana) |   |
|---|---|
| <b>Option Type:</b>                         | Component Trade-Off   |
| <b>Submitted By:</b>                        | NEEA  |
| <b>Date Approved:</b>                       | March, 2011   |
| <b>Description:</b>                         | Defines tradeoffs for Un-vented Crawlspace (substitutes crawlspace perimeter insulation for underfloor insulation).   |
| <b>References:</b>                          | <ol style="list-style-type: none"> <li>1. Northwest ENERGY STAR Homes 2011 Specifications for ID and MT BOP1</li> <li>2. Un-vented Crawlspace Trade-Off Specification, attached</li> </ol>  |
| <b>Additional Comments:</b>                 | <ol style="list-style-type: none"> <li>1. All requirements specified in NWBOP1 in ID and MT would apply to this TCO except as specified below.</li> <li>2. Homes built with electric resistance heating are not eligible for this trade-off.</li> <li>3. Crawlspace wall insulation shall be R-20.</li> <li>4. The crawlspace wall shall be sealed between the foundation and the rim joist as well as the rim joist to the subfloor and all other openings to the exterior shall be sealed.</li> <li>5. Mechanical ventilation for the crawlspace shall be provided in accordance with the Un-vented Crawlspace Specifications.</li> <li>6. Ducts in the crawlspace shall meet the minimum requirements in the NWBOP1 for sizing, insulation, sealing, and performance testing.</li> <li>7. Lighting in the home shall have a LPD of no greater than 0.6 W/ft<sup>2</sup> or use 90% or more high efficacy lamps.</li> </ol> |



## **Equipment Specifications and Installation Standards for Un-vented Crawlspace Trade-Off**

### **1.1 General**

This section focuses on the equipment specifications and installation standards for the Un-vented Crawlspace Trade-Off to meet the requirements of the NW ENERGY STAR® program as applied to the ID and MT BOP1. Wherever local codes are more stringent than these requirements such that application of the code would result in a higher level of efficiency, local code requirements shall apply.

To comply with the TCO in Idaho and Montana, all specifications of this TCO shall be followed. The specifications for each of the items are given in the following sections of this specification.

### **1.2. Application**

This path applies only to homes with gas furnaces, gas boilers, or heat pumps. Homes with electric zonal heat shall not be eligible for this construction practice.

### **1.3. Crawlspace Sealing**

Crawlspaces shall be sealed at both the rim joist and the mud sill with caulk, gasketing, and/or spray-applied material. All penetrations through the building envelope of the foundation wall, including the following, shall be sealed (e.g. caulking, expanding foam, tape, backer rod, gasket material, etc.) to limit air leakage. Special attention shall be paid to overall framing joints where floors intersect exterior walls (e.g. at rim and band joists and wall plates) and at the top and bottom of the mudsill.

If conditioned air from the furnace, heat pump, or air conditioner is supplied to the crawlspace, or if the house is connected to the crawl space by passive vents or ducts in any way, the blower door test for the home shall be conducted to include the un-vented crawlspace and the minimum envelope tightness requirements for the NWBOP1 shall be met.

### **1.4 Installation**

#### **1.4.1. Perimeter Insulation**

Perimeter insulation shall extend from the bottom of the subfloor to the crawlspace floor covering any exposed foundation. Minimum of R-20 insulation shall be provided at the entire perimeter of the crawlspace. Insulation shall be permanently attached to framing materials in a manner capable of structurally supporting the insulation. As of checklist implementation on January 1, 2012, Class 1 vapor retarders are not to be installed on the interior side of air permeable insulation in exterior below-grade walls.



#### 1.4.2. Crawlspace Floor Vapor Barrier

The floor of the crawlspace shall be covered with a vapor barrier, in accordance with the provisions of the International Building Code, and have a drain connected to the exterior foundation drains. Vapor barrier shall be lapped at each seam by a minimum of one foot. The vapor barrier shall meet the Class A performance specifications of ASTM E-1745 (water vapor permeance of 0.3 perms, tensile strength of 45 lbf/in, and puncture resistance of 2200g). Alternatively, vapor barriers not meeting this specification may still be used provided a "rat" slab (concrete, 2" minimum) is be poured over the vapor barrier. If radon mitigation is installed, 4" of drain gravel shall be installed below the vapor barrier and the passive or active radon ventilation shall connect to this layer.

#### 1.5. Crawlspace Ventilation

Mechanical ventilation shall be provided per the requirements of the International Residential Code. The amount of air supplied to the crawlspace shall not exceed 1CFM per 50 ft<sup>2</sup> of crawlspace area. If a crawl space exhaust fan is installed, it shall be rated for continuous duty and use no more than 35 Watts. Access to the exhaust fan shall be provided from the interior of the house.