



## LANE COUNTY PUBLIC WORKS

# 2017 ORSC Residential Energy Efficiency

LAND MANAGEMENT DIVISION 3050 N DELTA HYW, EUGENE OR 97408

The Oregon Residential Specialty Code, Section N1101.1, includes a requirement to provide two “additional measures” beyond the prescriptive envelope requirements for all conditioned spaces within residential buildings. These “additional measures” include an envelope enhancement as well as a conservation measure.

**Applicability:** The two additional measures must be selected for all new construction. Certain alterations, additions and changes of occupancy must also comply with this requirement. Reference ORSC N1101.2-3 for additional details on the applicability of these tables.

**References:** Table N1101.1(1), included at the bottom of the page, outlines prescriptive envelope requirements. Table N1101.1(2), included on the back of this sheet, lists six additional envelope enhancement measures as well as the seven additional conservation measures to choose from. Refer to Chapter 11 of the Oregon Residential Specialty Code for additional information.

**Alternate System Proposals:** Permit applicants will be asked to indicate which additional measures they intend to use and show all pertinent details and data as required by N1101.4. Alternate designs may be approved as long as the proposed design will not result in an increase in energy consumption. These alternate proposals must be accompanied by an energy analysis and are only allowed trade-offs between building envelope components in accordance with N1103.

**TABLE N1101.1(1) PRESCRIPTIVE ENVELOPE REQUIREMENTS<sup>a</sup>**

Building Component	Standard Base		Log Homes Only	
	Required Performance	Equiv. Value <sup>b</sup>	Required Performance	Equiv. Value <sup>b</sup>
Wall insulation-above grade	U-0.059 <sup>c</sup>	R-21 Intermediate <sup>c</sup>	Note d	Note d
Wall insulation-below grade <sup>e</sup>	C-0.063	R-15/R21	F-0.563	R-15/R-21
Flat ceilings <sup>f</sup>	U-0.021	R-49	U-0.020	R-49A <sup>h</sup>
Vaulted ceilings <sup>g</sup>	U-0.033	R-30 Rafter or R-30A <sup>g,h</sup> Scissor Truss	U-0.027	R-38A <sup>h</sup>
Underfloors	U-0.033	R-30	U-0.033	R-30
Slab edge perimeter	F-0.520	R-15	F-0.520	R-15
Heated slab interior <sup>i</sup>	n/a	R-10	n/a	R-10
Windows <sup>j</sup>	U-0.30	U-0.30	U-0.30	U-0.30
Window area limitation <sup>i,k</sup>	n/a	n/a	n/a	n/a
Skylights <sup>l</sup>	U-0.50	U-0.50	U-0.50	U-0.50
Exterior doors <sup>m</sup>	U-0.20	U-0.20	U-0.54	U-0.54
Exterior doors w>2.5 ft <sup>2</sup> glazing <sup>n</sup>	U-0.40	U-0.40	U-0.40	U-0.40
Forced air duct insulation	n/a	R-8	n/a	R-8

- a. As allowed in Section N1104.1, thermal performance of a component may be adjusted provided that overall heat loss does not exceed the total resulting from conformance to be required U-value standards. Calculations to document equivalent heat loss shall be performed using the procedure and approved U-values contained in Table N1104.1(1).
- b. R-values used in this table are nominal, for the insulation only in standard wood framed construction and not for the entire assembly.
- c. Wall insulation requirements apply to all exterior wood framed, concrete or masonry walls that are above grade. This includes cripple walls and rim joist areas. Nominal compliance with R-21 insulation and Intermediate Framing (N1104.5.2) with insulated headers.
- d. The wall component shall be a minimum solid log or timber wall thickness of 3.5 inches (90 mm).
- e. Below-grade wood, concrete or masonry walls include all walls that are below grade and does not include those portions of such wall that extend more than 24 inches (609.6 mm) above grade. R-21 for insulation in framed cavity; R-15 continuous insulation.
- f. Insulation levels for ceilings that have limited attic/rafter depth such as dormers, bay windows or similar architectural features totaling not more than 150 square feet (13.9 m<sup>2</sup>) in area may be reduced to not less than R-21. When reduced, the cavity shall be filled (except for required ventilation spaces). R-49 insulation installed to a minimum 6-inches depth at top plate at exterior of structure to achieve U-factor.
- g. Vaulted ceiling surface area exceeding 50 percent of the total heated space floor area shall have a U-factor no greater than U-0.026 (equivalent to R-38 rafter or scissor truss with R-38 advanced framing).
- h. A = Advanced frame construction. This shall provide full required insulating value to the outside of exterior walls. See section N1104.6.
- i. Heated slab interior applies to concrete slab floors (both on and below grade) that incorporate a radiant heating system within the slab. Insulation shall be installed underneath the entire slab.
- j. Sliding glass doors shall comply with window performance requirements. Windows exempt from testing in accordance with NF1111.2 Item 3 shall comply with window performance requirements if constructed with thermal break aluminum or wood, or vinyl, or fiberglass frames and double-pane glazing with low emissivity coatings of 0.10 or less. Buildings designed to incorporate passive solar elements may include glazing with a U-factor greater than 0.35 by using Table N1104.1(1) to demonstrate equivalence to building envelope requirements.
- k. Reduced window area may not be used as a trade-off criterion for thermal performance of any component. See Table N1101.1(1) for an exception.
- l. Skylight area installed at 2% or less of total heated space floor area shall be deemed to satisfy this requirement with vinyl, wood, or thermally broken aluminum frames and double-pane glazing with low-emissivity coatings. Skylight U-factor is tested in the 20 degree (3.35 rad) overhead plane per NFRC standards.
- m. A maximum of 28 square feet (2.6m<sup>2</sup>) of exterior door area per dwelling unit can have a U-factor of 0.54 or less.
- n. Glazing that is either double pane with low-e coating on one surface, or triple pane shall be deemed to comply with this U-0.30 requirements.

**TABLE N1101.1(2) ADDITIONAL MEASURES**

<b>Envelope Enhancement Measure (Select One)</b>	<b>1</b>	<b>High efficiency walls</b> Exterior walls - U-0.045/R21 cavity insulation + R-5 continuous
	<b>2</b>	<b>Upgraded features</b> Exterior walls - U-0.057/R23 intermediate or R-21 advanced, Framed floors - U-0.026/R-38, and Windows - U-0.28 (average UA)
		<b>Upgraded features</b> Exterior walls - U-0.055/R23 intermediate or R-21 advanced, Flat ceiling <sup>c</sup> - U-0.017/R60, and Framed floors - U-0.026/R38
	<b>4</b>	<b>Super Insulated Windows and Attic or Framed Floors</b> Windows - U-0.22 (Triple Pane Low-e), and Flat ceiling <sup>c</sup> - U-0.017/R60 or Framed floors - U-0.026/R-38
		<b>Air sealing home and ducts</b> Mandatory air sealing of all wall coverings at top plate and air sealing checklist <sup>f</sup> , and Mechanical whole-building ventilation system with rates meeting M1503 or ASHRAE 62.2, and All ducts and air handler are contained within building envelope <sup>d</sup> or All ducts sealed with mastic <sup>b</sup>
	<b>6</b>	<b>High efficiency thermal envelope UA<sup>g</sup></b> Proposed UA is 8% lower than the Code UA
<b>Conservation Measure (Select One)</b>	<b>A</b>	<b>High efficiency HVAC system<sup>a</sup></b> Gas-fired furnace or boiler with minimum AFUE of 94%, or Air-source heat pump with minimum HSPF of 9.5/15.0 SEER cooling, or Ground source heat pump COP 3.5 or Energy Star rated
		<b>Ducted HVAC systems within conditioned space</b> All ducts and air handler are contained within building envelope <sup>d</sup> Cannot be combined with Measure 5
	<b>C</b>	<b>Ductless heat pump</b> Ductless heat pump HSPF 10.0 in primary zone of dwelling
	<b>D</b>	<b>High efficiency water heater<sup>c</sup></b> Natural gas/propane water heater with UEF 0.85 or Electric heat pump water heater Tier 1 Northern Climate Specification Product

- a. Appliances located within the building thermal envelope shall have sealed combustion air installed. Combustion air shall be ducted directly from the outdoors.
- b. All duct joints and seams sealed with listed mastic; tape is only allowed at appliance or equipment connections (for service and replacement). Meet sealing criteria of Performance Tested Comfort Systems program administered by the Bonneville Power Administration (BPA).
- c. Residential water heaters less than 55 gallon storage volume.
- d. A total of 5 percent of an HVAC system's ductwork shall be permitted to be located outside of the condition space. Ducts located outside the conditioned space shall have insulation installed as required in this code.
- e. The maximum vaulted ceiling surface area shall not be greater than 50 percent of the total heated floor space area unless vaulted area has a U-factor no greater than U-0.026.
- f. Continuous air barrier. Additional requirement for sealing of all interior vertical wall covering to top plate framing. Sealing with foam gasket, caulk or other approved sealant listed for sealing wall covering material to structural material (example: gypsum board to wood stud framing).
- g. Table N1104.1(1) Standard base case design, Code UA shall be at least 8 percent less than the proposed UA. Buildings with fenestration less than 15 percent of the total vertical wall area may adjust the Code UA to have 15 percent of the wall area as fenestration.

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