

Appendix D

Washington State Residential Energy Code Summary

CHAPTER 6 BUILDING DESIGN BY PRESCRIPTIVE REQUIREMENTS APPROACH

SECTION 601 ? SCOPE

601.1 General: This chapter establishes design criteria in terms of prescribed requirements for building construction.

The provisions of this chapter are applicable to all Group R Occupancies. Occupancies shall comply with all the requirements of Chapter 5 except for the modifications herein specified.

For wood frame assemblies, the building envelope requirements of this chapter may be met by installing one of the prescriptive packages in Table 6-1 or 6-2. Installed components shall meet the requirements of Section 602. Compliance with nominal R-values shall be demonstrated for the thermal resistance of the added insulation in framing cavities and/or insulated sheathing only and shall not include the thermal transmittance of other building materials or air films, but shall permit interruption by occasional framing members. Other than wood frame assemblies with continuous insulation uninterrupted by framing shall also be allowed to comply with nominal R-values.

For metal assemblies, compliance shall be demonstrated in accordance with Chapter 4 or Chapter 5 based on the assemblies in Chapter 10. Compliance with nominal R-values is not allowed, unless the full nominal R-value of the insulation is installed either inside or outside of the framing and is uninterrupted by framing.

SECTION 602 ? BUILDING ENVELOPE REQUIREMENTS FOR GROUP R OCCUPANCY

602.1 Roof/Ceiling: Ceilings below vented attics and single-rafter, joist-vaulted ceilings shall be insulated to not less than the nominal R-value specified for ceilings in Table 6-1 or 6-2 as applicable.

602.2 Exterior Walls Both Above and Below Grade: Above grade exterior walls shall be insulated to not less than the nominal R-value specified in Table 6-1 or 6-2 as applicable. The following walls should be considered to meet R-21 without additional documentation:

1. 2 x 6 framed and insulated with R-21 fiberglass batts.
2. 2 x 4 framed and insulated with R-15 fiberglass batts plus R-4.0 foam sheathing.
3. 2 x 4 framed and insulated with R-13 fiberglass batts plus R-5.0 foam sheathing.

602.3 Exterior Walls (Below-Grade): Below-grade exterior walls surrounding conditioned space shall be insulated to not less than the nominal R-value specified for below-grade walls in Table 6-1 or 6-2 as applicable.

602.4 Slab-on-Grade Floors: Slab-on-grade floors shall be insulated along their perimeter to not less than the nominal R-values specified for slab-on-grade floors in Table 6-1 or 6-2 as applicable. Slab insulation shall be installed in compliance with Section 502.1.4.8. See Chapter 5, Section 502.1.4.9, for additional requirements for radiant slab heating.

602.5 Floors Over Unconditioned Space: Floors over unconditioned spaces, such as vented crawl spaces, unconditioned basements, and parking garages shall be insulated to not less than the nominal R-value shown for floors over unconditioned spaces in Table 6-1 or 6-2.

602.6 Exterior Doors: Doors shall comply with Sections 602.6.1 and 602.6.2.

EXCEPTIONS: 1. Doors whose area and U-factor are included in the calculations for compliance with the requirements for glazing in Section 602.7 shall be exempt from the door U-factor requirements prescribed in Table 6-1 or 6-2.

2. One unlabeled or untested exterior swinging door with the maximum area of 24 square feet may be installed for ornamental, security, or architectural purposes. Products using this exception shall not be included in either the U-factor or glazing area calculation requirements.

602.6.1 Exterior Door Area: For half-lite and full-lite doors, the glazing area shall be included in calculating the allowed total glazing area in Section 602.7.1. Single glazing used for ornamental, security, or architectural purposes shall be calculated using the exception to Section 602.7.2.

602.6.2 Exterior Door U-Factor: Doors, including fire doors, shall have a maximum area weighted average U-factor not exceeding that prescribed in Table 6-1 or 6-2.

602.7 Glazing

602.7.1 Glazing Area: The total glazing area as defined in Chapter 2 shall not exceed the percentage of gross conditioned floor area specified in Table 6-1 or 6-2. This area shall also include any glazing in doors.

602.7.2 Glazing U-Factor: The total glazing area as defined in Chapter 2 shall have an area weighted average U-factor not to exceed that specified in Table 6-1 or 6-2. U-factors for glazing shall be determined in accordance with Section 502.1.5. These areas and U-factors shall also include any doors using the exception of Section 602.6.

If the U-factors for all vertical and overhead glazing products are below the appropriate U-factor specified, then no calculations are required. If compliance is to be achieved through an area weighted calculation, then the areas and U-factors shall be included in the plans submitted with a building permit application.

EXCEPTION: Single glazing for ornamental, security, or architectural purposes and double glazed garden windows with a wood or vinyl frame shall be exempt from the U-factor calculations but shall have its area tripled and shall be included in the percentage of the total glazing area as allowed for in Table 6-1 or 6-2. The maximum area (before tripling) allowed for the total of all single glazing and garden windows is 1% of the floor area.

602.8 Air Leakage for Group R Occupancy: The minimum air leakage control measures shall be as specified in Section 502.4 as applicable.

SECTION 603 ? BUILDING MECHANICAL SYSTEMS FOR GROUP R OCCUPANCY

603.1: Group R Occupancies that are space heated by air-to-air, ground-to-air or water-to-air heat pumps shall comply with Table 6-1 or 6-2. System sizing shall be determined by an analysis consistent with Section 503.2 of this Code, or, when approved by the building official, Chapter 9. All mechanical equipment efficiencies and service water heating system efficiencies shall comply with standards as stated in Sections 503 and 504 of this Code.

SECTION 604 ? RESERVED

SECTION 605 ? LIGHTING

Lighting shall comply with Section 505.

TABLE 6-1
PRESCRIPTIVE REQUIREMENTS^{0,1} FOR GROUP R OCCUPANCY
CLIMATE ZONE 1

Option	Glazing Area ¹⁰ : % of Floor	Glazing U-Factor		Door ⁹ U-Factor	Ceiling ²	Vaulted Ceiling ³	Wall Above Grade ¹²	Wall• int ⁴ Below Grade	Wall• ext ⁴ Below Grade	Floor ⁵	Slab ⁴ on Grade
		Vertical	Overhead ¹¹								
I.	12%	0.35	0.58	0.20	R-38	R-30	R15	R-15	R-10	R-30	R-10
II.*	15%	0.40	0.58	0.20	R-38	R-30	R-21	R-21	R-10	R-30	R-10
III.	Unlimited Group R-3 Occupancy Only	0.40	0.58	0.20	R-38	R-30	R-21	R-21	R-10	R-30	R-10

* Reference Case

0. Nominal R-values are for wood frame assemblies only or assemblies built in accordance with Section 601.1.

1. Minimum requirements for each option listed. For example, if a proposed design has a glazing ratio to the conditioned floor area of 13%, it shall comply with all of the requirements of the 15% glazing option (or higher). Proposed designs which cannot meet the specific requirements of a listed option above may calculate compliance by Chapters 4 or 5 of this Code.

2. Requirement applies to all ceilings except single rafter or joist vaulted ceilings. 'Adv' denotes Advanced Framed Ceiling.

3. Requirement applicable only to single rafter or joist vaulted ceilings.

4. Below grade walls shall be insulated either on the exterior to a minimum level of R-10, or on the interior to the same level as walls above grade. Exterior insulation installed on below grade walls shall be a water resistant material, manufactured for its intended use, and installed according to the manufacturer's specifications. See Section 602.2.

5. Floors over crawl spaces or exposed to ambient air conditions.

6. Required slab perimeter insulation shall be a water resistant material, manufactured for its intended use, and installed according to manufacturer's specifications. See Section 602.4.

7. Int. denotes standard framing 16 inches on center with headers insulated with a minimum of R-5 insulation.

8. This wall insulation requirement denotes R-19 wall cavity insulation plus R-5 foam sheathing.

9. Doors, including all fire doors, shall be assigned default U-factors from Table 10-6C.

10. Where a maximum glazing area is listed, the total glazing area (combined vertical plus overhead) as a percent of gross conditioned floor area shall be less than or equal to that value. Overhead glazing with U-factor of U=0.40 or less is not included in glazing area limitations.

11. Overhead glazing shall have U-factors determined in accordance with NFRC 100 or as specified in Section 502.1.5.

12. Log and solid timber walls with a minimum average thickness of 3.5" are exempt from this insulation requirement.