

hall of the house of representatives at the national capitol to commemorate her fame and historic services as a great Washingtonian and a great American.

NEW SECTION. Sec. 2. The governor, the lieutenant governor, and the speaker of the house of representatives, or their designees, shall serve as a committee to procure or provide a statue of Mother Joseph and to have the statue erected in the statuary hall in accordance with 40 U.S.C. Sec. 187. The governor, the lieutenant governor, and the speaker of the house of representatives may collectively appoint two citizens at large to serve on the committee.

NEW SECTION. Sec. 3. The committee shall accept donations and gifts from individuals, groups, and associations to carry out this act.

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Approved by the Governor May 4, 1977.

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## CHAPTER 14

[House Bill No. 98]

### THERMAL PERFORMANCE STANDARDS FOR NEW DWELLINGS

AN ACT Relating to thermal performance standards for new dwellings; amending section 3, chapter 96, Laws of 1974 ex. sess. as amended by section 8, chapter 110, Laws of 1975 1st ex. sess. and RCW 19.27.030; amending section 4, chapter 96, Laws of 1974 ex. sess. and RCW 19.27.040; adding new sections to chapter 96, Laws of 1974 ex. sess. and to chapter 19.27 RCW; creating new sections; and providing for an expiration date.

Be it enacted by the Legislature of the State of Washington:

NEW SECTION. Section 1. APPLICATION AND SCOPE. There shall be in effect in all cities, towns, and counties of the state thermal performance and design standards for new dwellings for which building permits are applied subsequent to ninety days after the effective date of this amendatory act as set forth in this amendatory act.

This amendatory act shall apply to all new dwellings which are equipped with heating and/or cooling systems and for which applications for building permits are made subsequent to ninety days after the effective date of this amendatory act: PROVIDED, HOWEVER, This amendatory act shall not be applicable to single family dwellings not intended for year round occupancy, as the term "dwellings not intended for year round occupancy" is defined by the county legislative authority.

NEW SECTION. Sec. 2. PURPOSE. The legislature finds that it is in the public interest to provide a reasonable degree of conservation of critical energy supplies, and that this amendatory act will establish certain necessary maximum allowable heat loss rates and/or minimum thermal performance standards for dwellings to achieve this degree of energy conservation.

NEW SECTION. Sec. 3. DEFINITIONS. For the purpose of this amendatory act, the following definitions shall apply:

(1) "Dwelling" means any building or any portion thereof which provides complete, independent living facilities which are used, intended, or designed to be built,

used, rented, leased, let, or hired out to be occupied or which are occupied for living purposes. "Dwelling" does not include apartment houses over three stories in height, hotels, motels, or lodging houses.

(2) "ASHRAE" means the American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.

(3) "BTU" means British Thermal Unit.

(4) "C" value (thermal conductance) means the amount of heat, measured in BTU's, transferred through one square foot of a building material of given thickness in one hour when there is one degree temperature difference between the surfaces of the material.

(5) "R" value (thermal resistance) means the measure from the resistance of a material or building component to the passage of heat. The resistance value "R" of mass type insulations shall be for the material only. "R" values shall be as listed in the current ASHRAE Handbook of Fundamentals, or as tested in accordance with current applicable standards.

(6) "U" value means the total heat flow, measured in BTU's, through one square foot of a building section or assembly, air to air, in one hour per degree F. temperature difference. Mathematically  $U = 1 \div R$  (subscript t) in which R (subscript t) equals the sum of the resistance (R) for the individual components of the assembly. "U" values shall be calculated according to ASHRAE methods and shall not consider the effect of occasional framing members such as studs or joists.

(7) "Exterior wall area" means the gross area of wall surfaces of heated spaces which are exposed to outside temperatures, and includes wall areas, window areas, door areas, and areas of foundation walls above the exterior grade.

(8) "Glazing" means all transparent or translucent materials in exterior wall openings. For the purpose of calculating the area of glazed openings, the area of sash shall be included.

(9) "Special glazing" means glazing which has a maximum "U" value of 0.70. Insulating glass with at least one quarter inch air space or approved storm sash will be considered to provide the "U" value required.

(10) "Unheated spaces" means any space exposed to outside temperatures and not provided with a heat supply capable of maintaining a minimum temperature of 50°F. This will include, but not be limited to, ventilated crawl spaces, attics, unheated garages, and unheated basement areas.

(11) "Heating and/or cooling systems" means any device or combination of devices which consume any fuel and/or electricity for the purpose of providing heat to or removing heat from a building to maintain its interior temperature above or below outside temperature.

**NEW SECTION.** Sec. 4. COMPLIANCE. (1) General. Dwellings covered by this amendatory act shall be so constructed that the total structural heat loss from the building will not exceed the total structural heat loss resulting from compliance with the maximum "U" or "C" values for the component parts as specified in this chapter: PROVIDED, That compliance with these provisions shall be deemed conclusive when certified to by a registered architect or registered mechanical engineer. In lieu of the "U" or "C" value listed, installed insulation with the minimum "R" value (insulation material only) listed for each location shall be deemed to satisfy those requirements.

(2) Compliance Card. Upon completion of the installation of insulation, a card certifying that the insulation has been installed in conformance with the requirements of this 1977 amendatory act shall be completed and signed by the builder or insulation applicator. For this purpose, any certification card which contains all the essential data may be used. The insulation compliance card shall indicate the "R" value of insulation (material only) installed in the ceilings, walls, floors, on the perimeter, and ducts. When loose fill insulation is used the card shall show the square footage and the number and weight of bags installed to obtain the "R" value listed. The card must be posted at a conspicuous location within the building and will indicate the installation date.

NEW SECTION. Sec. 5. THERMAL DESIGN STANDARDS FOR CEILINGS AND EXTERIOR WALL SECTIONS ABOVE GRADE EXCLUDING DOORS AND WINDOWS. Ceilings and above grade exterior wall sections, excluding doors and windows, must be constructed to comply with the values as shown in Table A.

TABLE A

Maximum allowed "U" values of ceiling and above grade exterior wall sections. Minimum "R" values shown are for added insulation material only.

Roof Decks <sup>1</sup>		Ceilings <sup>2,5</sup>		Walls			
				Concrete or Masonry <sup>3</sup>		Wood or Metal Frame <sup>3,4</sup>	
<u>"U"</u>	<u>"R"</u>	<u>"U"</u>	<u>"R"</u>	<u>"U"</u>	<u>"R"</u>	<u>"U"</u>	<u>"R"</u>
0.09	8	0.05	19	0.13	6	0.08	11

Footnotes to Table A:

1. Indicates construction using rigid insulation installed on the roof deck. When adequate space within the roof cavity is available and insulation is on the ceiling, use the values for ceilings.
2. When enclosed rafter spaces are formed by ceilings being applied directly to the underside of the roof rafters, the ceiling rafters must be of sufficient size to provide a minimum of one inch clear vented air space above the insulation.
3. Exterior concrete or masonry foundation walls of heated "unfinished" basements and cellars extending no more than an average of 24 inches above the adjacent finish grade need not be insulated until finished. Insulation installed shall comply with the requirements of this table and apply to above and below grade foundation walls: PROVIDED, That any exterior frame cripple walls enclosing heated spaces shall comply with the insulation requirements of this table.
4. Where there are no occasional framing members such as studs, or when all of the thermal insulation is not penetrated by occasional framing members, the required maximum allowable U-values may be increased by multiplying by a factor of 1.15.
5. Ceilings between two adjacent heated spaces need not be insulated.

**NEW SECTION. Sec. 6. THERMAL DESIGN STANDARDS FOR OPENINGS.** (1) When more than twenty-five percent of the exterior wall area of buildings constructed east of the Cascade Mountain Ridge and when more than thirty-five percent of the exterior wall area of buildings constructed west of the Cascade Mountain Ridge consists of glazing, at least one-half shall be special glazing. However if the glazing exceeds forty percent of the exterior wall area, at least ninety percent must be special glazing. For this purpose, exterior walls enclosing heated spaces in the entire structure shall be included in calculating the overall percentage of glazing.

(2) Skylights in ceilings and roofs shall have a "U" value not exceeding 0.70 if their total area exceeds two percent of the gross ceiling area. Insulating glass with at least one-quarter inch air space or double-walled plastic bubbles will be considered to provide the "U" value required.

**NEW SECTION. Sec. 7. THERMAL DESIGN STANDARDS FOR FLOOR SECTIONS AND SLABS-ON-GRADE.** (1) Floor Sections over Unheated Spaces. Insulation shall be required in floor sections over unheated spaces with a maximum "U" value 0.08 and a minimum insulation "R" value 9: PROVIDED, That insulation shall not be required in floor sections over heated crawl space plenum areas or in vented crawl spaces where the vents are equipped with tightly-fitting operable louvers: PROVIDED, That the perimeter walls are insulated from the interior ground level to the subflooring to provide maximum "U" value of 0.13 minimum insulation "R" value 6. Insulation material shall be attached in a permanent manner. Floors over other heated spaces need not be insulated.

(2) Slab-on-Grade Floors of Heated Spaces. The "R" value of the insulation around the perimeter of the floor shall be not less than that shown in Table B. Insulation shall extend downward from the top of the slab or, alternatively, downward and then horizontally under the slab for the minimum distances specified. Perimeter insulation may be installed on the outside of the foundation wall if it is protected from weather and damage. Insulation shall not be required for any portion of the slab floor that is more than 12 inches below the adjacent exterior grade.

**TABLE B**  
**MINIMUM ALLOWABLE "R" VALUES AND DEPTHS OF EDGE INSULATION**  
**FOR SLAB-ON-GRADE FLOORS**

Heated Slabs <sup>1</sup>		Unheated Slabs	
<u>"R" Value</u>	<u>Inches</u>	<u>"R" Value</u>	<u>Inches</u>
6	18	4	12

**Footnote to Table B:**

<sup>1</sup>Slabs internally heated or with perimeter heat ducts in or under the slab.

**NEW SECTION. Sec. 8. GENERAL CONSTRUCTION REQUIREMENTS.** (1) A minimum ground cover of 4 mil. (0.004 inch) polyethylene or equivalent, lapped one foot at each joint, is required in crawl spaces. A vapor barrier shall be properly installed at exterior frame walls and in ceilings formed when a finish surface is applied directly to the underside of the roof rafters.

(2) Loose Fill. Blown or poured loose fill insulation may be used in attic spaces where the slope of the roof is not less than 2 1/2 feet in 12 feet and there is at least 30 inches of clear distance from the top of the bottom chord of the truss or ceiling joist to the underside of the roof sheathing at the roof ridge. When eave vents are installed, adequate baffling of the vent openings must be provided so as to deflect the incoming air above the surface of the insulation. In lieu of a framing baffle, batt or blanket insulation with an equivalent "R" value for ceilings as specified in Table A may be installed from the outer edge of the exterior wall extending a minimum of two feet inwards.

(3) Air Leakage. All doors, windows, skylights, and openings enclosing a heated space and exposed to the exterior or to unheated spaces shall be weatherstripped, caulked, gasketed, or otherwise treated in accordance with sound building practices.

NEW SECTION. Sec. 9. DUCT INSULATION. When supply and return air ducts used for heating and/or cooling are located in unheated spaces, they shall be insulated to provide a maximum "C" value of 0.30 at 75°F mean temperature, minimum insulation "R" value 3.5.

NEW SECTION. Sec. 10. PIPING INSULATION. All steam and steam condensate return piping and all continuously circulating heating hot water piping which is located in unheated spaces shall be insulated to provide a maximum "C" value of 0.30 at 75° mean temperature, minimum insulation "R" value 3.5. Insulation shall not be required where piping passes through framing members.

Sec. 11. Section 3, chapter 96, Laws of 1974 ex. sess. as amended by section 8, chapter 110, Laws of 1975 1st ex. sess. and RCW 19.27.030 are each amended to read as follows:

~~((On and after January 1, 1975;))~~ There shall be in effect in all cities, towns and counties of the state a state building code which shall consist of the following codes which are hereby adopted by reference:

(1) Uniform Building Code and Related Standards, 1973 edition, published by the International Conference of Building Officials;

(2) Uniform Mechanical Code, 1973 edition, including Chapter 22, Fuel Gas Piping, Appendix B, published by the International Conference of Building Officials and the International Association of Plumbing and Mechanical Officials;

(3) The Uniform Fire Code with appendices thereto, 1973 edition, published by the International Conference of Building Officials and the Western Fire Chiefs Association;

(4) The Uniform Plumbing Code, 1973 edition, published by the International Association of Plumbing and Mechanical Officials: PROVIDED, That chapter 11 of such code is not adopted: PROVIDED, That notwithstanding any wording in this code, nothing in this code shall apply to the installation of any gas piping, water heaters, or vents for water heaters; ~~((and))~~

(5) The rules and regulations adopted by the council establishing standards for making buildings and facilities accessible to and usable by the physically handicapped or elderly persons as provided for in RCW 70.92.100 through 70.92.160; and

(6) The thermal performance and design standards for dwellings as set forth in sections 2 through 10 of this amendatory act. This subsection shall be of no further force and effect when sections 1 through 10 of this amendatory act expire as provided in section 14 of this amendatory act.

In case of conflict among the codes enumerated in subsections (1), (2), (3) and (4) of this section, the first named code shall govern over those following.

Sec. 12. Section 4, chapter 96, Laws of 1974 ex. sess. and RCW 19.27.040 are each amended to read as follows:

On and after January 1, 1975, the governing body of each city, town or county is authorized to amend the state building code as it applies within its jurisdiction in all such respects as shall be not less than the minimum performance standards and objectives enumerated in RCW 19.27.020, including, the authority to adopt any subsequent revisions to the codes in RCW 19.27.030(1), (2), (3), (4) ~~((and))~~ (5), and (6), as now or hereafter amended: PROVIDED, That amendments to RCW 19.27.030(6), so adopted result in structures that do not exceed the overall structural heat loss characteristics that would have resulted from conforming to RCW 19.27.030(6), as now or hereafter amended.

Nothing in this section shall authorize any modifications of the requirements of chapter 35, Laws of 1967, or chapter 70.92 RCW.

NEW SECTION. Sec. 13. The senate and house committees on energy and utilities shall make continuing studies of the state building code as it relates to energy consumption, conservation and retention and shall submit their recommendations concerning such to the legislature periodically.

NEW SECTION. Sec. 14. Sections 1 through 10 of this amendatory act, as now or hereafter amended, shall expire at such time as the thermal performance standards are incorporated in the uniform building code and related standards as published by the international conference of building officials, and adopted by the legislature of the state of Washington.

NEW SECTION. Sec. 15. Sections 1 through 10 of this amendatory act shall be added to chapter 96, Laws of 1974 ex. sess. and to chapter 19.27 RCW.

NEW SECTION. Sec. 16. CAPTIONS. Chapter, section, and subsection captions or headings as used in sections 1 through 10 of this amendatory act do not constitute any part of the law.

NEW SECTION. Sec. 17. If any provision of this amendatory act, or its application to any person or circumstance is held invalid, the remainder of the act, or the application of the provision to other persons or circumstances is not affected.

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