

FORM OF ORDER AND TRANSMITTAL BY BOARD, COMMISSION, OR COUNCIL

State of Washington

State Building Code Advisory Council
(name of governing body)

(agency name, if applicable)

Resolution No.

Administrative Order No.83-07

(1) Be it resolved by the State Building Code Advisory Council
acting at Sea-Tac Fire Station
(place)

that it does adopt the annexed rules relating to:

Amendments to Chapter 51-12 WAC - Washington State Energy Code

(2) ALTERNATIVE A. Use only for Adoption of Permanent Rules.

This action is taken pursuant to Notice No. 83-10-082
filed with the code reviser on May 4, 1983. These rules shall take effect:
[X] thirty days after they are filed with the code reviser pursuant to RCW 34.04.040(2).
[] at a later date, such date being

(2) ALTERNATIVE B. Use only for Adoption of Emergency Rules.

We, find that
an emergency exists and that this order is necessary for the preservation of the public health, safety, or general
welfare and that observance of the requirements of notice and opportunity to present views on the proposed action
would be contrary to public interest. A statement of the facts constituting the emergency is:

These rules are therefore adopted as emergency rules to take effect upon filing with the code reviser.

(3) Pursuant to the requirements of RCW 34.04.026 that "every agency shall incorporate the most specific, but
in no case omit all, of the following language alternatives when adopting or amending rules" fill in statement (a), (b),
or (c) as appropriate:

[X] (a) This rule is promulgated pursuant to RCW 19.27.075
and is intended to administratively implement that statute.

[] (b) This rule is promulgated pursuant to RCW
which directs that the

(agency)
has authority to implement the provisions of

(name of act or RCW citation)

[] (c) This rule is promulgated under the general rule-making authority of the

(agency)

as authorized in RCW

(4) The undersigned hereby declares that the agency has complied with the provisions of the Open Public
Meetings Act (chapter 42.30 RCW), the Administrative Procedure Act (chapter 34.04 RCW), and the State Register
Act (chapter 34.08 RCW) in the adoption of these rules.

(5) This order, after being first recorded in the order register of this governing body, is herewith transmitted to
the Code Reviser for filing pursuant to chapter 34.04 RCW and chapter 1-12 WAC.

STATE OF WASHINGTON
APPROVED AND ADOPTED July 20, 1983
FILED

OCT 10 1983

By [Signature]
Chairman

Title

Amendments to Chapter 51-12, WAC
Washington State Energy Code
Adopted by the State Building Code
Advisory Council July 20, 1983

Underlining indicates changes or additions to the code language of the Washington State Energy Code adopted effective June 30, 1980.

Language to be deleted is indicated by being struck through.

9/23/83

Section 102. Scope

(a) Exempt Buildings

2. Buildings and structures or portions thereof which are neither heated nor cooled by ~~fuel or electricity~~, a depletable energy source.

Section 207 G

GROSS WALL AREA. The vertical projection of the exterior wall area bounding interior space which is conditioned by an energy-using system; includes opaque wall, window, clerestory, and door areas. The gross area of exterior walls consists of all opaque wall areas, including fully insulated foundation walls above and below grade, between floor spandrels, peripheral edges of floors, window areas including sash, and door areas, where such surfaces are exposed to outdoor air and enclose a heated or mechanically cooled space including interstitial areas between two such spaces.

Section 208 H

HEATED SPACE. Space, within a building, which is provided with a positive heat supply to maintain air temperature of 50°F (10°C) or higher ~~or-as-set~~.

Section 219 S

SPECIAL GLAZING. Glazing which has a maximum "U" value of 0.65. Insulating glass with at least ¼ inch air space or approved storm sash will be considered to provide the "U" value required. Sealed insulated glass shall be tested in accordance with Specification ASTM E-774 to a minimum class "C" in accordance with a nationally recognized certification program and shall be so labeled.

Section 403

- (b) Floors over unheated spaces shall not exceed the U_o values given in Table 4-2. ~~4-4~~
- (c) Slab on Grade Floor: For slab on grade floors, the thermal resistance of the insulation around the perimeter of the floor shall not be ~~greater~~ less than the value given in Table 4-2. The insulation shall extend downward from the top of the slab for a minimum distance of 24 inches or downward to the bottom of the slab then horizontally beneath the slab for a minimum total distance of 24 inches.

Section 404. Thermal Performance Criteria for all Other Occupancies.

(a) Heating Criteria.

1. The overall average thermal transmittance value (U_o) of the gross area of elements of the exterior building envelope of all buildings other than low-rise residential buildings shall not exceed the values given in Tables 4-3 and 4-4. Equations 1 and 2 shall be used to determine acceptable combinations of building components and thermal properties to meet this requirement for heating. ~~Steady-state U_w values for opaque wall sections may be corrected by multiplying by the appropriate M-Factor before the calculation of U_o in Equation 2 of this section.~~ U_o and U_w are specified in units of
$$\frac{\text{BTU}}{\text{hr. sq. ft. } ^\circ\text{F}}$$
3. Slab on Grade Floors: For slab on grade floors the thermal resistance of the insulation around the perimeter of the floor shall not be ~~greater~~ less than the value given in Table 4-3 and 4-4.

New Subsection

4. Alternative Wall Allowance for Low Rise Non-Residential Occupancies.
 - A. For non-residential occupancy buildings, three stories or less, the maximum allowed value for average thermal transmittance (U_o) of the exterior walls may be increased to the values given in Table 4.4 provided that at least one of the following criteria is also met:
 - i. Mechanical supply of outside air and mechanical exhaust of building air shall be automatically shut off and the duct closed for at least eight hours per day during hours of non-occupancy, or
 - ii. The primary source of heating for the building shall be one or more heat pumps meeting the provisions of Section 411(b) or gas or oil combustion heating equipment with a minimum combustion efficiency of 85% for central heating plants and 80% for room and space heaters. This efficiency shall be determined in accordance with the provisions of Section 411(c).

Provided further: that if both criteria are met, the maximum allowed value for average thermal transmittance (U_e) of the exterior walls used in Table 4.4 may be increased by 0.05 in determining compliance with the provisions of the code.

- B. For walls with a wall weight of at least 30 lbs per sq. ft. (provided that walls constructed of hollow masonry units have cores filled with either grout, concrete, or with an insulating material with thermal resistance per inch (R) of at least 2.25 sq. ft. -hr.- °F/BTU) the calculated thermal resistance of the wall sections measured face to face on wall units which are exposed to inside air temperatures, not including the thermal resistance of air films or additional exterior wall elements, may be increased by 25% in determining compliance with the provisions of the code provided that:

Heating and cooling set-point temperatures in the conditioned spaces or zones of the building shall be separated by at least 5°F. The temperature control shall be designed to prevent new energy from being used to heat the space above the heating set-point temperature or cool the space below the cooling set-point temperature.

Section 411. HVAC Equipment Performance Requirements.

(h) Fireplaces. Fireplaces shall be provided with:

1. Tightly fitting flue dampers, operated with a readily accessible manual or approved automatic control.

EXCEPTION: Fireplaces with gas logs installed in accordance with UMC 803 shall be equipped with tightly fitting glass or metal doors.

Section 418. Piping Insulation. All piping installed to serve buildings (and within) shall be thermally insulated in accordance with Table 4-17, except as stated herein, (for recirculating service water heating systems, see Section ~~419~~ 422).

(b) Exceptions:

3. When the heat loss and/or heat gain of the piping, without insulation, does not increase the energy requirements of the building or is used as a component of a designed Heating System.

Section 419. ~~Service Water Heating.~~ (Reserved)

~~(a) General: Hot water for domestic, sanitary and swimming pool purposes shall be generated and delivered in a manner conducive to saving heat energy.~~

~~(b) Scope: The purpose of the following provisions is to provide criteria for design and equipment selection that will produce energy savings when applied to service water heating.~~

Section 420. Water Heaters, Storage Tanks, Boilers, and Piping.
(when installed in non-conditioned spaces)

(a) Performance Efficiency.

- ~~1. All gas and oil fired, automatic storage heaters shall have a recovery efficiency (E_r) not less than 75 percent and a stand-by loss percentage (S) not exceeding:~~

$$S = 2.3 + 67/V$$

where:

V = rated volume in gallons

~~When tested in accordance with an approved or nationally recognized standard, and when coefficients are applied to compensate for the specific type of fuel used.~~

1. Gas, oil fired water heaters and electric storage water heaters meeting the requirements of ASHRAE standards 90.75 and so labeled shall be deemed as satisfying the requirements of this subsection.

(b) Temperature Controls

3. Swimming Pools

Heated swimming pools shall be equipped with:

A. ~~Controls which allow water temperature to be regulated from the maximum design temperature down to 65°F.~~

B. ~~An ON-OFF switch for the pool heater, mounted for easy access to allow shutting off the operation of the heater without adjusting the thermostat setting and to allow restarting without relighting a pilot light; and~~

- A. A label on the pool heater that provides the following information: (The following recommendations replace requirements for temperature and on/off controls.)
Pool heating -- 78°F is the recommended healthful swimming pool temperature for most people. The water heater thermostat should be set at 78°F, marked to identify that setting, and further adjustments should be discouraged. An increase of 4°F (such as from 78°F to 82°F) could increase energy consumption by as much as 40%.

Filter System -- the time clock for operating the filter system should be set to operate the filter system for the minimum number of hours of operation required to maintain clean and healthful pool water.

Pool Cover -- it is recommended that the pool be covered except when the pool is in use. Use of the cover can cut pool heating costs by as much as 70 percent.

- e. B. A pool cover at the surface of the water.

~~Section 422. Pipe Insulation. For recirculation systems, the minimum piping insulation shall be in accordance with Table 4-17. For recirculating systems, piping heat loss shall be limited to a maximum of 25 BTU/hr.ft.² of external pipe surface above ground piping and a maximum of 35 BTU/hr.ft.² of external pipe surface for underground piping. Maximum heat loss shall be determined at a temperature differential equal to the maximum water temperature minus a design ambient temperature no higher than 65 degrees F.~~

Section 601. Building Envelope Requirements.

(a) Walls. The opaque exterior wall sections and the interior walls exposed to unheated spaces shall have a thermal resistance "R" value ~~and shall~~ not be less than the value specified in Table 6-1.

(c) Thermal Design Standards for Floors.

2. Floor Sections. Floor sections over unheated spaces, such as unheated basements, unheated garages or ventilated crawl spaces, shall be constructed to comply with the required values as specified in Table 6-1.

EXCEPTION: Insulation may be omitted from floor over heated basements, heated garages, or under floor areas used as plenums or in zones III, IV, and V where operable foundation vents are used. If foundation walls are insulated in accordance with Section 601(a), the insulation shall be attached in a permanent manner.

Section 602. Building Mechanical Systems - General.

(a) 3. Fireplaces shall be provided with:

- A. Tightly fitting flue dampers, operated with a readily accessible manual or approved automatic control,

EXCEPTION: Fireplaces with gas logs installed in accordance with UMC 803 shall be equipped with tightly fitting glass or metal doors.

Section 603. Service Water Heating.

(b) Swimming Pools

Heated swimming pools shall be equipped with:

1. ~~Controls to limit heating water temperature to no more than 80°F, and~~

A label on the pool heater that provides the following information: (the following recommendations replace requirements for temperature and on/off controls).

Pool heating --78°F is the recommended healthful swimming pool temperature for most people. The water heater thermostat should be set at 78°F, marked to identify the setting, and further adjustments should be discouraged. An increase of 4°F (such as from 78°F to 82°F) could increase energy consumption by as much as 40%.

Filter system --the time clock for operating the filter system should be set to operate the filter system for the minimum number of hours of operation required to maintain clean and healthful pool water.

Pool cover -- it is recommended that the pool be covered except when the pool is in use. Use of the cover can cut pool heating costs by as much as 70 percent.

2. A pool cover at the surface of the water.

(d) Pipe Insulation for Recirculating Systems.

~~For recirculating systems, piping heat loss shall be limited to a maximum of 25 BTU/hr-ft² of external pipe surface for above~~

groundpiping and a maximum of 35 BTU/hr ft² of external pipe surface for underground piping. Maximum heat loss shall be determined at a temperature differential equal to the maximum water temperature minus a design ambient temperature no higher than 65°F. (Table 4-17).

All recirculating system piping installed to serve buildings (and within) shall be thermally insulated in accordance with Section 422.

(f) Water Heater

An insulation wrap shall be added to all electric water heaters with less than R-16, sufficient to bring the total insulation up to R-16. Gas, oil fired water heaters, and electric storage water heaters must meet the requirements of ASHRAE standards 90.75, and be so labeled.

TABLE 4-2
Maximum Allowed U_o Values
Residential Occupancies
Buildings 3 Stories or Less

Glazing ²	Zone	Roofs Ceilings	Walls ¹ (including glazing)	Floors	Values for Perimeter Insulation			
					Heated Slab on Grade		Unheated Slab on Grade	
U_o		U_o	U_o	U_o	U_o	R	U_o	R
0.65	I	0.03	0.20	0.08	0.15	6.35	0.23	4.25
0.65	II	0.03	0.19	0.08	0.15	6.35	0.23	4.25
0.65	III	0.03	0.19	0.08	0.15	6.35	0.23	4.25
0.65	IV	0.03	0.18	0.08	0.12	8.00	0.19	5.40
0.65	V	0.03	0.15	0.05	0.12	8.00	0.19	5.40

1. In no case shall the average value of the opaque sections of frame or cavity wall be greater than $U = 0.08$.
2. All glazing must be special glazing, except that no more than 1% of the gross exterior wall may be single glazing for architectural, ~~or~~ ornamental or security purposes.

TABLE 4-7
Factors For Use With Equations 2 & 3

WALLS		
WEIGHT OF CONSTRUCTION lbs./ft. ²	$T_{D_{EQ}}$ FACTOR	M-FACTOR
0-25	44	1.00
26-40	37	0.96
41-70	30	0.93
71 and above	23	0.90

TABLE 4-8
Allowable Air Infiltration Rates

Windows	Residential Doors		Commercial Doors
	<u>cfm per lin.ft. of crack</u>		cfm per lin.ft. of crack
(cfm per lineal foot of operable sash crack)	sliding glass	entrance	swinging, sliding, revolving
0.5	0.5	1.00	11.0

TABLE 4-18

Occupancy type	Lighting power budget- (watts/sq.ft.)
Auditoriums, theatres, public assembly	1.1
Hospitals	2.0
Indoor parking	0.3
Libraries	2.0
Offices	2.0
Restaurants	1.85
Retail Stores and Museums	
Class I (less than 1000 sq.ft.)	3.0
Class II (1000 to 6000 sq.ft.)	2.75
Class III (6000 to 20,000 sq.ft.)	2.6
Class IV (20,000 to 40,000 sq.ft.)	2.5
Class V (over 40,000 sq.ft.)	2.35
Schools	2.0
Warehouses	0.7

*NOTE: In the case of an occupancy type not specifically mentioned above, the lighting power budget in watts per square foot shall ~~not apply~~ be determined by the building official based on the most comparable occupancy type.