

WASHINGTON STATE BUILDING CODE COUNCIL
APPLICATION FOR REVIEW OF A PROPOSED STATEWIDE AMENDMENT
TO THE WASHINGTON STATE BUILDING CODE

1. State Building Code to be Amended.

- | | |
|---|--|
| <input type="checkbox"/> International Building Code | <input type="checkbox"/> Ventilation and Indoor Air Quality Code |
| <input type="checkbox"/> International Residential Code | <input type="checkbox"/> International Mechanical Code |
| <input type="checkbox"/> ICC ANSI A117.1 Accessibility Code | <input type="checkbox"/> International Fuel Gas Code |
| <input type="checkbox"/> International Fire Code | <input type="checkbox"/> NFPA 54 National Fuel Gas Code |
| <input type="checkbox"/> Uniform Plumbing Code | <input type="checkbox"/> NFPA 58 Liquefied Petroleum Gas Code |
| <input checked="" type="checkbox"/> State Energy Code | |

Section 1009

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2. Applicant:

Northwest Concrete Masonry Association

3. Signed:

<u>Tom Young</u>	<u>Director</u>	<u>2/28/11</u>
Proponent	Title	Date

4. Contact Person:

<u>Tom Young</u>	<u>Director</u>
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5. Proposed Code Amendment (Underline all added words, strike through deleted words) Additional pages may be attached.

Code Energy Section 1009 Page 72

Amend section to read as follows:

Section 1009 Mass

1009.1 General: Tables 10-9 ~~and 10-10~~ lists default mass values for ~~concrete masonry~~ residential construction types. Calculations are based on standard ASHRAE values for heat-storage capacity as listed in Standard RS-1, Chapter 26.

Thermal capacity of furniture is ignored, as is heat storage beyond the first four inches of mass thickness. All mass is assumed to be in direct contact with the conditioned space. Concrete separated from the heated volume by other materials must multiply the listed concrete mass value by the result of the following formula:

$$\text{Ln}(\text{R-value}) \times (-.221) + 0.5$$

Where:

Ln = Natural log

R-value = R-value of material covering concrete

Note: All default values for covered concrete slabs have been adjusted according to this procedure.

1009.2 Mass Description: Mass is divided into two types: Structural and additional.

Structural Mass: Includes heat-storage capacity of all standard building components of a typical residential structure, including floors, ceilings, and interior and exterior walls in Btu/ft²•°F of floor area. It also assumes exterior wall, interior wall and ceiling surface area approximately equals three times the floor area.

Additional Mass: Includes any additional building material not part of the normal structure, which is added specifically to increase the building's thermal-storage capability. This category includes masonry fireplaces, water or trombe walls, and extra layers of sheetrock. Coefficients are in Btu/ft²•°F of surface area of material exposed to conditioned space. The coefficient for water is Btu/°F•gallon.

1009.3 Component Description: Light frame assumes one inch thick wood flooring with five-eighths inch sheetrock on ceilings and interior walls, and walls consisting of either five-eighths inch sheetrock or solid logs. Slab assumes a four-inch concrete slab on or below grade, with five-eighths inch sheetrock on exterior and

interior walls and ceiling, and with separate values for interior or exterior wall insulation. Adjustments for slab covering is based on R-value of material. Additional mass values are based on the density multiplied by the specific heat of the material adjusted for listed thickness.

Add new:

Section 1010 - Heat Capacity

1010.1 General: Table 10-10 lists heat capacity values for brick, concrete, and concrete masonry materials.

TABLE 10-9 10-10
HEAT CAPACITY

	Partial Grout	Solid Grout
8" CMU	9.65	15.0
12" CMU	14.5	23.6
8" Brick	10.9	16.4
6" Concrete	NA	14.4

TABLE 10-10 10-9
DEFAULT MASS VALUES

Structural Mass M-value	Btu/ft² • °F floor area
Light Frame:	
Joisted/post & beam floor, sheetrock walls and ceilings	3.0
Joisted/post & beam floor, log walls, sheetrock ceilings	4.0
Slab With Interior Wall Insulation:	
Slab, no covering or tile, sheetrock walls and ceilings	10.0
Slab, hardwood floor covering, sheetrock walls and ceilings	7.0
Slab, carpet and pad, sheetrock walls and ceilings	5.0
Slab With Exterior Wall Insulation:	
Slab, no covering or tile, sheetrock walls and ceilings	12.0
Slab, hardwood floor covering, sheetrock walls and ceilings	9.0
Slab, carpet and pad, sheetrock walls and ceilings	7.0
Additional Mass M-Value:	Btu/ft² • °F surface area
Gypsum wallboard, 1/2 inch thickness	0.54
Gypsum wallboard, 5/8 inch thickness	0.68
Hardwood floor	1.40
Concrete/Brick, 4 inch-thickness	10.30
Concrete/Brick, 6 inch-thickness	15.40
	Btu/°F • gallon
Water, 1 gallon	8.0

6. Background information on amendment.

NOTE: State-wide and emergency state-wide amendments to the state building code should be based on one of the following criteria:

- (1) The amendment is needed to address a critical life/safety need.
- (2) The amendment is needed to address a specific state policy or statute.
- (3) The amendment is needed for consistency with state or federal regulations.
- (4) The amendment is needed to address a unique character of the state.
- (5) The amendment corrects errors and omissions.

This amendment clarifies that the provisions of Section 1009 apply only to residential construction and not to nonresidential. Section 1009.1 addresses thermal storage properties of mass materials located inside the residential building envelope.

When WSEC Chapters 10 and 20 were merged to eliminate duplication these two unrelated tables were placed in the same code section causing confusion among some designers. Placing these tables in two separate sections clarifies their application. It also is consistent with the IECC and ASHRAE 90.1 regarding heat capacity criteria for mass walls.

Economic Impact Worksheet

(Required for statewide amendment requests. Attach supporting documentation.)

Code References: WSEC Title: Sections 1009 & 1010

Proponent: Tom Young Phone: (425) 697-5298 Date: 02-28-2011

Part I ❖ Amendment Benefit:

PROBLEM(S) ADDRESSED: Clarify code for users. Consistency with IECC and ASHRAE 90.1

PRIMARY REASON FOR AMENDMENT: (check one only)

- Protect public health, safety and welfare Mandate from legislation or courts
 Reduce cost Code change
 "Manage risk" for government Other _____

TYPE OF BENEFITS PROJECTED: (check all that apply)

- Saves lives/reduces injuries Saves energy
 Protects/improves long-term health Protects environment
 Reduces construction cost: Increases accessibility
 Over existing code requirement Reduces regulation
 Canceling new code requirement Reduces government enforcement cost
 Off-setting new code requirement Clarifies/improves existing code
 Increases construction alternatives Protects property loss/damage
 Other _____

Part II ❖ Amendment Impacts:

TYPES OF CONSTRUCTION: New Construction Remodeling/Tenant Improvement/Repair

COMPLETE TABLE FOR EACH BUILDING TYPE CHECKED (See reverse for instruction on items ^a through ^e)

√	Building Type	Construction ^a 1st Cost		Enforcement ^b		Owner ^c Ongoing		Other		Supporting data attached
		C/S ^d	Degree ^e	C/S ^d	Degree ^e	C/S ^d	Degree ^e	C/S ^d	Degree ^e	
	Residential									✓
	Single family									
	Multi-family									
√	Commercial/Retail	-	1	-	1					
√	Industrial	-	1	-	1					
√	Government/Utilities	-	1	-	1					
√	Other: Institutional	-	1	-	1					

OTHER EFFECTS:

Evaluate by number scale 0-3 (0=none, 3=significant)

- 0 Likelihood for litigation
0 Decrease public cooperation
3 Disadvantage small business
 Other _____

Evaluate by letter code

- (Spec, Custom, Factory, Remodel, Manufact., Other, NA)
 ___ Advantage one industry
 ___ Disadvantage one industry

Part III ❖ Comments and Recommendations:

Evaluate each by number scale 0-3 (0=none, 3=significant)

- 0 Difficulty to Enforce 2 Cost of not adopting amendment
0 Costs exceed Benefits 0 Degree of TAG controversy
2 C/S Confidence level

Evaluate Yes or No (circle one)

- N Were alternative solutions considered
 Y / N Recommend further benefit/impact analysis
 Y / N Recommend future benefit/impact review