

51.00: continued

R403.1.6 Add the designation “A 307 or other applicable steel” before the word “anchor bolt” in the first sentence of the second paragraph. Also, after the words “anchor bolts” insert the text “installed in accordance with the manufacturer’s printed instructions.”

R404.1.7 Add a last sentence as follows:

Backfill material shall be free draining and free of organic materials, construction debris, cobbles and boulders, shall be placed in lifts not exceeding 12-inches and shall be mechanically compacted.

R406.2 After the last paragraph (on membranes) add this paragraph:

Through-wall formwork ties shall be removed from both faces of the foundation walls which enclose basements, cellars, below-grade garages or any space having the potential to be converted to useable or occupied space. Remaining holes shall be patched with hydraulic cement.

R408.7 Delete the exception.

R502.2.2 At the end of this paragraph add this text “and no live load acting on the interior span.”

R502.3 At the end of the second sentence add this text:

“or the American Wood Council (AWC) *Maximum Span Calculator for Wood Joists & Rafters* found at <http://www.awc.org/calculators/span/calc/timbercalcstyle.asp>”

R502.11.1 Replace “registered professional” with “registered design professional”.

R506.1.1 Add subsection, exception, and associated table:

R506.1.1 Control Joints. Slabs shall be constructed with control joints having a depth of at least one quarter of the slab thickness but not less than one inch (25 mm). Joints shall be spaced at intervals not greater than 30 feet (9144 mm) in each direction. Control joints shall be placed at locations where the slab width or length changes.

Exception. Control joints may be omitted when the slab is reinforced in accordance with Table R506.1.1. Reinforcement shall be placed at the mid-depth of the slab or two inches (51 mm) from the top of slabs greater than four inches (102 mm) in thickness.

Table R506.1.1

Maximum Dimension of Slab or Distance Between Control Joints (ft.)						WWF Wire Spacing (in.)	WWF Wire Size Designation (in.)
Slab Thickness (in.)							
3.5	4	4.5	5.0	5.5	6		
42	36	32	29	26	24	6 x 6	W1.4 x W1.4
59	52	46	42	38	35	6 x 6	W2.0 x W2.0
86	75	67	60	55	50	6 x 6	W2.9 x W2.9

R602.10 Add a second exception as follows:

Exception 2. Unconditioned single story rooms, of areas less than 600 sq. ft., where the main dwelling is connected to the room via an exterior door or slider and no other openings between the main dwelling and room exist (*i.e.* thermally isolated).

702.3.5.1 Add subsection:

702.3.5.1 Ceiling attachment. Only designs or methods that use mechanical fasteners in accordance with Table R702.3.5 shall be used for attaching gypsum board to ceilings in buildings governed by this code including manufactured buildings. Alternative designs, such as using adhesive only, are not permitted.

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R802.4 Add this text to the end of the second sentence:

‘or utilize the American Wood Council (AWC) *Maximum Span Calculator for Wood Joists & Rafters* found at <http://www.awc.org/calculators/span/calc/timbercalcstyle.asp>

R802.5 Add this text to the end of the second sentence:

‘or utilize the American Wood Council (AWC) *Maximum Span Calculator for Wood Joists & Rafters* found at <http://www.awc.org/calculators/span/calc/timbercalcstyle.asp>

R901.1 Add a final sentence as follows:

In roofing and reroofing, the energy conservation requirements of Chapter 11 must also be satisfied.

R905.1 Add a final sentence as follows:

Where there is a discrepancy between the requirements of this section and the manufacturer’s printed instructions or code evaluation report, the manufacturer’s printed instructions or code evaluation report shall govern.

R906.1 Add a final sentence as follows:

In roofing and reroofing, the energy conservation requirements of Chapter 11 must also be satisfied.

R1001.1 Add a second sentence that reads:

Chimneys shall be structurally sound, durable, smoke tight and capable of conveying flue gases to the exterior safely.

R1003.11 Add a second sentence that reads:

Liner size, length and installation shall be in accordance with this code or the appliance manufacturer’s requirements as applicable.

N1101.2 Replace as follows:

N1101.2 Compliance. Compliance shall be demonstrated by meeting the requirements of the *International Energy Conservation Code 2012* with these Massachusetts amendments:

R402.4.1.2 Replace the third sentence as follows:

Testing and verification shall be done by a HERS Rater, HERS Rating Field Inspector, an applicable BPI Certified Professional, or a BBRIS approved third party.

R403.2.2 Add this note at the end of this section:

Note: Postconstruction or rough-in testing and verification shall be done by a HERS Rater, HERS Rating Field Inspector, an applicable BPI Certified Professional, or a BBRIS *approved* third party.

R403.5 Replace as follows but retain R403.5.1:

R403.5 Mechanical ventilation (Mandatory).

Each *dwelling unit* of a *residential building* shall be provided with continuously operating exhaust or balanced mechanical ventilation that has been site verified to meet a minimum airflow per

1. the Energy Star Homes' Version 3 or
2. ASHRAE 62.2 - 2013 or
3. the following formula for one- and two-family dwellings and townhouses of three or less *stories above grade plane:*

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$$Q = .03 \times \text{CFA} + 7.5 \times (N_{br} + 1) - 0.052 \times Q_{50} \times S \times \text{WSF}$$

Where: CFA is the *conditioned floor area* in sq ft
 N_{br} is the number of bedrooms
 Q_{50} is the verified blower door air leakage rate in cfm measured at 50 Pascals
 S is the building height factor determined by this table:

stories above grade plane	1	2	3
S	1	1.32	1.55

WSF is the shielded weather factor as determined by this table:

County	WSF
Barnstable	0.6
Berkshire	0.52
Bristol	0.54
Dukes	0.59
Essex	0.58
Franklin	0.52
Hampden	0.49
Hampshire	0.59
Middlesex	0.55
Nantucket	0.61
Norfolk	0.52
Plymouth	0.53
Suffolk	0.66
Worcester	0.59

R403.5.2 to R403.5.7 Add sections:

R403.5.2 Verification: Installed performance of the mechanical ventilation system shall be tested and verified by a HERS Rater, HERS Rating Field Inspector, an applicable BPI Certified Professional, or a BBRS *approved* third party and measured using a flow hood, flow grid, or other airflow measuring device in accordance with either RESNET Standard Chapter 8, ACCA Standard 5, or other BBRS *approved* standard for air flow measurement.

R403.5.3 Air-moving Equipment, Selection and Installation. As referenced in ASHRAE Standard 62.2-2013, Section 7.1, ventilation devices and equipment shall be tested and certified by AMCA (Air Movement and Control Association) or HVI (Home Ventilating Institute) and the certification label shall be found on the product. Installation of systems or equipment shall be carried out in accordance with manufacturers' design requirements and installation instructions. Where multiple duct sizes and/or exterior hoods are standard options, the minimum size shall not be used.

R403.5.4 Sound Rating. Sound ratings for fans used for whole building ventilation shall be rated at a maximum of 1.0 sone.

Exception: HVAC air handlers and remote-mounted fans need not meet sound requirements. There must be at least 4 ft of ductwork between the remote-mounted fan and intake grille.

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R403.5.5 Documentation. The owner and the occupant of the *dwelling unit* shall be provided with information on the ventilation design and systems installed, as well as instructions on the proper operation and maintenance of the ventilation systems. Ventilation controls shall be labeled with regard to their function, unless the function is obvious.

R403.5.6 Air Inlets and Exhausts. All ventilation air inlets shall be located a minimum of 10 ft from vent openings for plumbing drainage systems, appliance vent outlets, exhaust hood outlets, vehicle exhaust, or other known contamination sources; and shall not be obstructed by snow, plantings, or any other material. Outdoor forced air inlets shall be covered with rodent screens having mesh openings not greater than ½ inch. A *whole house mechanical ventilation system* shall not extract air from an unconditioned basement unless *approved* by a *registered design professional*. Where wall inlet or exhaust vents are less than seven (7) feet above finished grade in the area of the venting, including but not limited to decks and porches, a metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) feet above grade directly in line with the vent terminal. The sign shall read, in print size no less than one-half (½) inch in size, "MECH. VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS".

Exceptions:

1. Ventilation air inlets in the wall \geq 3 ft. from dryer exhausts and contamination sources exiting through the roof.
2. No minimum separation distance shall be required between local exhaust outlets in kitchens/bathrooms and windows.
3. Vent terminations that meet the requirements of the *National Fuel Gas Code* (NFPA 54/ ANSI Z223 .1) or equivalent.

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R403.5.7 Combustion and Solid Fuel Burning Appliances. Furnaces, boilers, and water heaters shall be mechanically drafted, direct vented, or power vented/exhausted per NFPA 54, 527 CMR 4, the *International Mechanical Code 2009*, and 248 CMR as applicable.

Exception: Homes with naturally drafted furnaces, boilers, and water heaters shall meet RESNET or BPI combustion safety test procedures and the selected standard's limits for depressurization, spillage, draft pressure, and CO concentration in ambient air.

R405.6.2.1 Add subsection:

R405.6.2.1 Approved Calculation Software Tools. Software tools meeting the requirements of subsection 405.6 are:

1. **REScheck:** Version 4.4.4 or later found at <http://www.energycodes.gov/>.
2. RESNET accredited software.

R405.7 Add subsections:

R405.7 Approved Alternative Energy Performance Methods. In addition to the IECC performance compliance path detailed in subsections R405.1 to R405.6 the following rating threshold criteria of this section are sufficient to demonstrate energy code compliance under section R405 without calculation of a standard reference design. The *mandatory* provisions of subsection R401.2 also apply.

1. **RESNET Approved Software for the Home Energy Rating System (HERS).** A HERS rater verified index on 65 or less is required for each *dwelling unit* before electrical renewable energy systems are credited. Also a HERS rater verified ENERGY STAR Thermal Enclosure Checklist shall be completed.
2. **Passive House Institute US (PHIUS) Approved Software: Passive House Planning Package (PHPP).** Where the Specific Space Heat Demand as modeled in Passive House Planning Package (PHPP) by a Certified Passive House Consultant is less than or equal to 16 KBtu/sq ft/year.

405.7.1 Documentation. The following documentation is required for energy code compliance under subsection 405.7:

1. For HERS compliance, a compliance report which includes a proposed HERS index of 65 or less, a description of the building's energy features, and a statement that the rating index is "based on plans" will be required for issuance of a building *permit*. A copy of the final as built certificate indicating that the HERS rater verified index is 65 or less for each *dwelling unit* and a completed HERS rater verified ENERGY STAR Thermal Enclosure Checklist is to be submitted to the *building official* before the certificate of occupancy is issued.

The certificate required in Section R401.3 will list the HERS index rating of each *dwelling unit*.

2. For Passive House Planning Package (PHPP) verified compliance, a list of compliance features, and a statement that the estimated Specific Space Heat Demand is "based on plans" will be required for issuance of a building *permit*. A copy of the final PHPP report indicating the finished building achieves a Certified Passive House Consultant-verified Specific Space Heat Demand of less than or equal to 16 KBtus/sq ft/year shall be submitted to the *building official* before the certificate of occupancy is issued. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72° (22°C) for heating and minimum of 74° (23°) for cooling.

N1101.3 thru 1104.1 Delete all.

M1201.1 Add a final sentence as follows:

In this chapter where the design, installation, maintenance, alteration and/or inspection of mechanical systems is controlled by one of the *specialized codes* (see Chapter 1) the requirements of the *specialized codes* govern and enforcement shall be by a person other than the *building official*.

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M1301.1 Add a final sentence as follows:

In this chapter where the design, installation, maintenance, alteration and/or inspection of mechanical systems is controlled by one of the *specialized codes* (see Chapter 1) the requirements of the *specialized codes* govern and enforcement shall be by a person other than the *building official*.

M1303.2 Add subsection:

M1303.2 Solid Fuel-burning Appliance Labeling. Solid fuel-burning appliances (see Subsection M1303.3 for Central Heating Appliances) shall bear a permanent and legible factory-applied label supplied to the manufacturer and controlled by an approved testing agency; such label shall contain the following information:

1. Manufacturer's name and trademark;
2. Model and/or identification number of the appliance;
3. Type(s) of fuel(s) approved;
4. Testing laboratory's name or trademark and location;
5. Date tested;
6. Clearances to combustibles:
 - a. Above top
 - b. From front
 - c. From back
 - d. From sides
7. Floor protection*;
8. National test (listing) standard(s); and
9. Label serial number.

*If floor protection information is not on the label, it will be acceptable if contained with the User/Installation Manual.

M1303.3 Add subsection:

M1303.3 Solid Fuel-burning Central Heating Appliance Labeling. Solid fuel-burning boilers or warm air furnaces shall bear a permanent and legible factory-applied label supplied to the manufacturer and controlled by an approved testing agency; such label shall contain Subsection M1303.2 items 1. to 9. and the following information:

10. Type of appliance (boiler or warm air furnace);
11. Boilers, pressure vessels, and pressure relief devices must be stamped in accordance with M.G.L. c. 146, §§ 24 and 34.

M1401.1 Add a final sentence as follows:

In this chapter where the design, installation, maintenance, alteration and/or inspection of mechanical systems is controlled by one of the *specialized codes* (see Chapter 1) the requirements of the *specialized codes* govern and enforcement shall be by a person other than the *building official*.

M1401.6 Add subsection:

M1401.6 Solid Fuel-Burning Heating Appliances. Solid fuel-burning heating appliances include, but are not limited to: room heaters and stoves, fireplace inserts, furnaces and boilers. The fuel for such appliances includes, but is not limited to: wood, wood pellets, coal, nut shells, and corn. Solid fuel-burning appliances shall be tested and listed by approved agencies and installed, operated and maintained in accordance with such listing, the manufacturers' requirements and otherwise conform to the requirements of this chapter or those found in the *International Mechanical Code*.

Notes:

1. No solid fuel-burning appliance shall be installed in Massachusetts unless such appliance conforms to all applicable requirements of this chapter, including the testing and listing of all clearances to combustibles and identification of required floor protection.