

Department of Public Safety

Cutting & Notching Requirements

(And Other Information)

**Ninth Edition of The Massachusetts
Building Code (780 CMR)**

Based on
The International Residential Code (IRC) 2015

by

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The Ninth Edition of the Massachusetts Building Code

Comprised of the following I-Codes

- 2015 International Residential Code
- 2015 International Building Code
- 2015 International Existing Buildings Code
- 2015 International Energy Conservation Code
- 2015 International Mechanical Code
- 2015 International Swimming Pool & Spa Code
- 2015 International Fire Code
- As Amended by the BBRS



The Ninth Edition of the Massachusetts Building Code

Portions of this presentation are based on the International Code Council's (ICC) ***2015 IRC Code and Commentary®***, used with kind permission of the ICC.



Adoption of the I-Codes throughout the USA



Introduction to IRC International Code Council (ICC)



Introduction to IRC

Where to Purchase

- All I-Codes may be purchased directly from the ICC by visiting their website @ iccsafe.org
- Massachusetts Amendments are posted on the Department of Public Safety Website @ www.mass.gov/dps or, when finalized,
- May be purchased from the Secretary of State @ <http://www.sec.state.ma.us/spr/spridx.htm>



Department of Public Safety Support

- DPS Website <http://www.mass.gov/eopss/agencies/dps/>
- Update of Ninth Edition Progress
- <http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/buildings/updates-to-draft-9th-edition-of-the-building-code.html>
- State Inspectors by District
- <http://www.mass.gov/eopss/agencies/dps/state-inspector-districts.html>
- Code Interpretations
- <http://www.mass.gov/eopss/consumer-prot-and-bus-lic/license-type/buildings/official-building-code-interpretations/>



Department of Public Safety Support

State Inspectors Tewksbury Office

- John Bennett
- John Jarvis
- Gene Novak
- Ron Wetmore
- Rick Bienvenue
- Electrical Inspector Ed Poulin

State Inspectors Milford Office

- Supervisor Jeff Putnam
- Marc LaPointe
- Andy Majuri
- John Wojciechowicz
- Harold Leaming
- Bill Horrocks
- Adelle Reynolds
- Paul DiChiara

State Inspectors Springfield Office

- Gordon Bailey
- David Holmes
- Louise Vera

Others in Boston & Milford

- Robert Anderson
- Felix Zemel
- Tom Riley
- Patty Barry
- Lisa Barros
- Kim Spencer
- Linda Shea
- Steve Kennealy



Transition to the Ninth Edition

- **Eighth Edition of the Code** based on the 2009 International Codes.
- **Ninth Edition** skips the 2012 I-Code cycle and segues to the 2015 I-Codes.





Single Family Dwelling

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DWELLING. Any building that contains one or two *dwelling units* used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes.





Two-family Dwelling

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DWELLING. Any building that contains one or two *dwelling units* used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes.



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TOWNHOUSE. A single-family dwelling unit constructed in a group of three or more attached units in which each unit extends from foundation to roof and with a yard or public way on at least two sides.



Town Houses



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- **RI01.3 Intent.** The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment, and to provide safety to fire fighters and emergency responders during emergency operations.
- **RI01.4 Referenced Codes.** Referenced codes include the specialized codes of M.G.L. c. 143, § 96 and other codes and regulations listed in 101.4.1 through 101.4.12 and shall be considered part of this code to the prescribed extent of each such reference. Work regulated by the specialized codes of M.G.L. c. 143, § 96 shall be designed, installed and inspected by individuals authorized to do so in accordance with the specialized codes. However, the impact of work regulated by the specialized codes of M.G.L. c. 143, § 96 and other codes and regulations on work governed by this code and within the jurisdiction of the *building official*, shall be subject to inspection by the *building official*.





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- **R101.4.1 Gas and Fossil Fuel Burning Appliances.** Reference to the *International Fuel Gas Code* shall be considered reference to 248 CMR: *Board of State Examiners of Plumbers and Gas Fitters*. Gas fired appliances are governed 248 CMR. Oil fired appliances are governed by 527 CMR 4.00: *Oil Burning Equipment*.
- **R101.4.2 Mechanical.** The provisions of the *International Mechanical Code (IMC)* shall apply to all mechanical systems except for that which is defined as sheet metal work by M.G.L. c. 112, § 237.
- **R101.4.3 Plumbing.** Reference to the *International Plumbing Code* shall be considered reference to 248 CMR: *Board of State Examiners of Plumbers and Gas Fitters*.
- **R101.4.4 Property Maintenance.** Reference to the *International Property Maintenance Code* shall be considered reference to this code (780 CMR) and within the jurisdiction of the *building official*.
- **R101.4.5 Fire Prevention.** Reference to sections of the *International Fire Code (IFC)* for fire prevention requirements shall be considered reference to 527 CMR: *Board of Fire Prevention Regulations*. The fire official enforces the provisions of 527 CMR. Reference to sections of the *International Fire Code (IFC)* Edition for building code requirements are adopted, except that retroactive requirements of the IFC are not adopted. The *building official* enforces 780 CMR and all adopted IFC requirements.

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- **RI01.4.10 Electrical.** Any reference in this code to the International Electrical Code shall be considered reference to 527 CMR 12.00: *Massachusetts Electrical Code (Amendments)*.
- **RI01.4.11 International Residential Code.** Any reference in this code to the *International Residential Code* shall be considered reference to 780 CMR 51.00 through 120.00.
- **RI01.4.12 Residential Contracting.** Residential contracting, as defined by Section 80 of Chapter 27 of the Acts of 2009, is also regulated by M.G.L. c. 142A and 201 CMR 18.00. For information including, but not limited to registrations, renewals, and filing of complaints against a Home Improvement Contractor (HIC), please contact the Office of Consumer Affairs and Business Regulation, which administers the program.



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- **SECTION 102 APPLICABILITY**
- **RI02.1 General.** Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.
- **Exception:** Where enforcement of a provision of this code would violate the conditions of a listing or manufacturer's instructions, the conditions of the listing and manufacturer's instructions shall apply.
- **RI02.2 Other Laws.** The provisions of this code shall not nullify any provision of state or federal law. Massachusetts General Laws (M.G.L.s) and the Code of Massachusetts Regulations (CMRs) are often referenced in this code. It is the code user's responsibility to determine all applicable laws and regulations relevant to sections in this code.



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SECTION 105 PERMITS

R107.1.5 Manufactured Buildings and Modular Homes. Document submittal shall be as follows:

- Site specific plans and specifications.
- Plan Identification Number Assignment Form with BBRS number. This is to confirm plans have been *approved* by the State and must include a stamp approval and signature.
- Plans must be stamped on every page by a Third Party Inspection Agency.
- Every page showing calculations by a *registered design professional* must be provided with their stamp and signature.
- Energy compliance certificate.
- Set manuals are required to be on site at time of project set and must be specific to the project.
- **Exception:** If all connection details are provided on the plans then the set manual is not required.
- Set crew information must accompany the plan submittal package with *approved* certification from manufacturer.
- **R107.1.6 Townhouse buildings greater than 35,000 cubic feet.** Such buildings require *registered design professional* services in accordance with 780 CMR 107.6 *Construction Control*.



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- The International Residential Code (IRC) addresses **Cutting and Notching** in 13 Sections.
- Massachusetts **does not** adopt the Electrical or Plumbing provisions of the IRC. However, there is some good guidance about what to do and not to do provided in those portions of the IRC. Some of the following slides use information from those codes for illustration purposes. Those sections listed below with an R prefix are adopted for use in the commonwealth and are enforced by state and municipal building inspectors as applicable.

Structural Member

Code Reference

- | | |
|-------------------|--|
| • Steel Joists | R505.2.5, R505.3.5, R804.2.5, R804.3.3 |
| • Steel Studs | R603.2.6, R603.3.4 |
| • Wood Joists | R502.8, R802.7.1 |
| • Wood Studs | R602.6 |
| • Wood Top Plates | R602.6.1 |
| • Mechanical | M1308 |

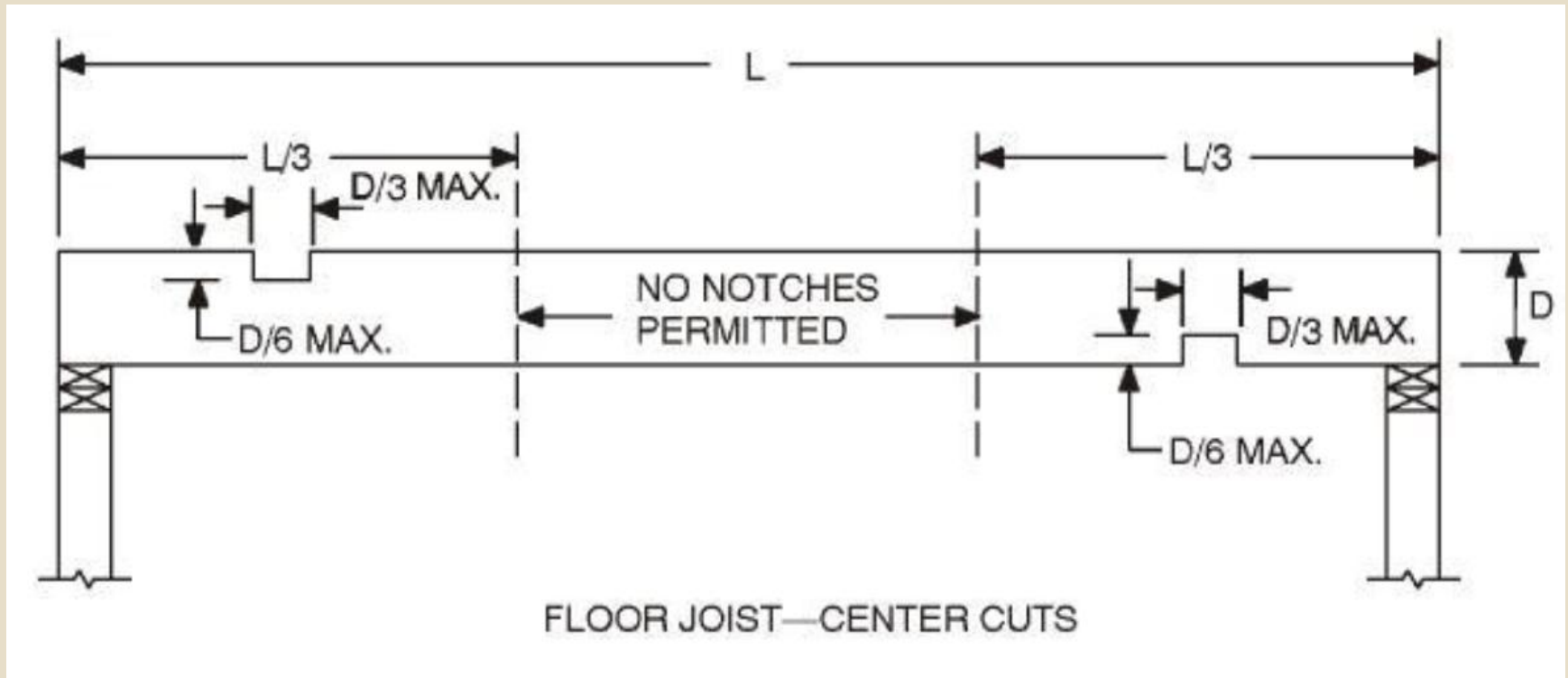
These Sections Provided as Reference Only

- | | |
|--------------|---------|
| • Electrical | E3402.1 |
| • Plumbing | P2603.2 |



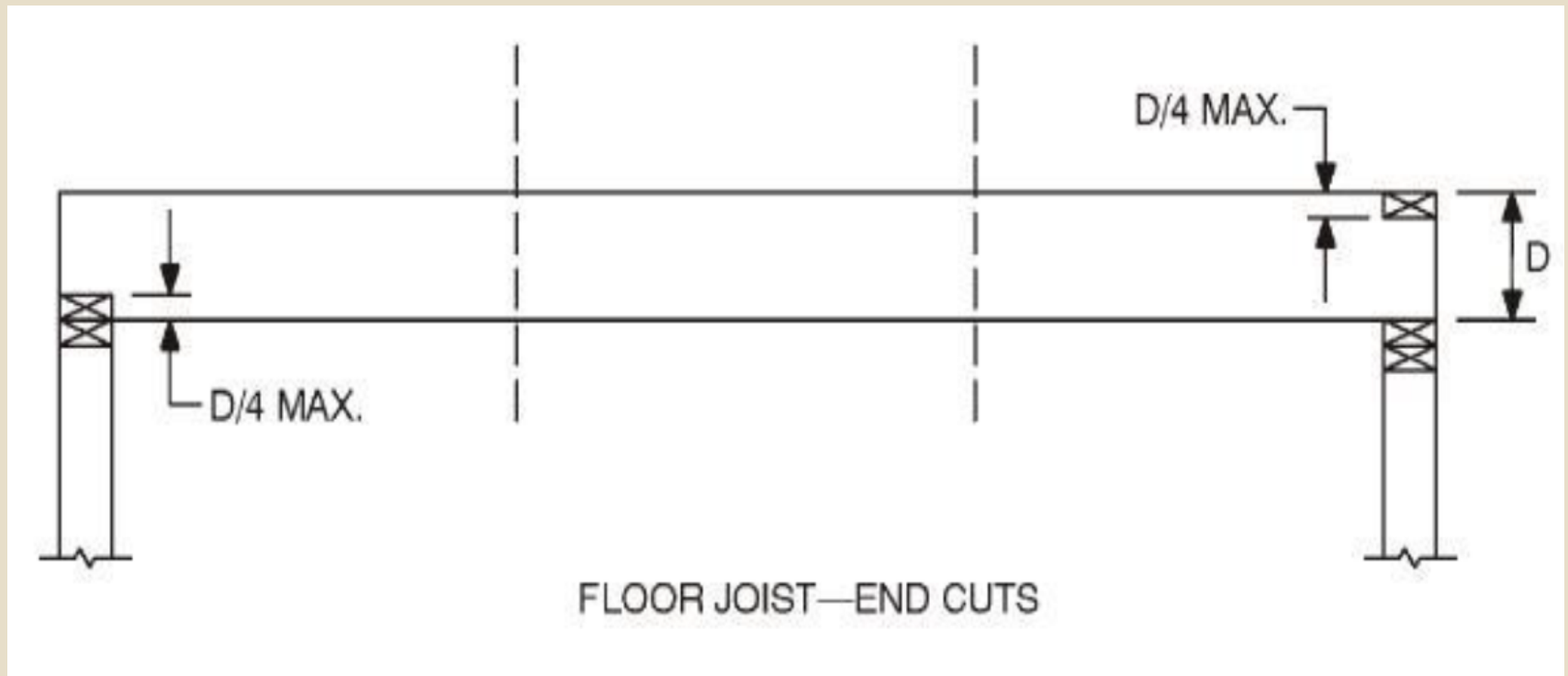
TRANSITION TO THE NINTH EDITION

R502.8 Drilling and notching. **Structural floor members** shall not be cut, bored or notched in excess of the limitations specified in this section. See Figure R502.8.



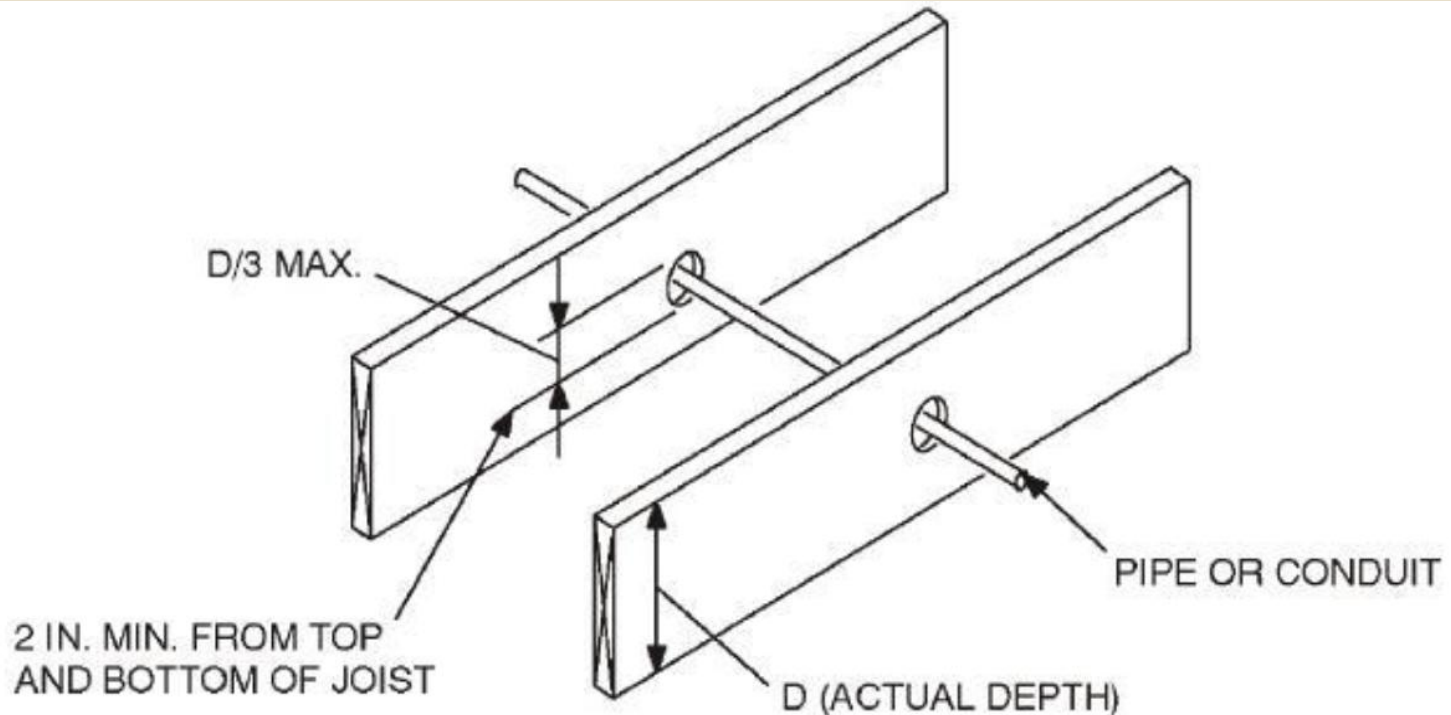
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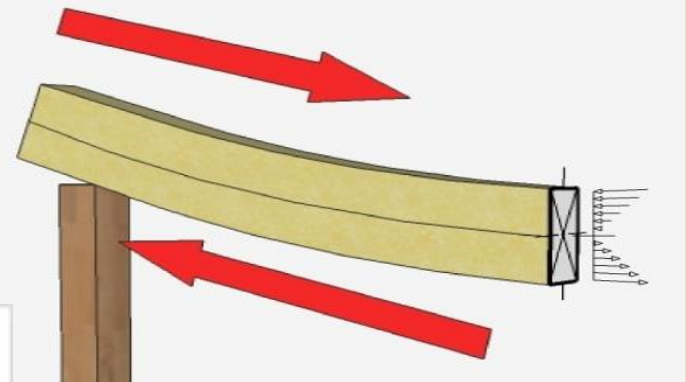
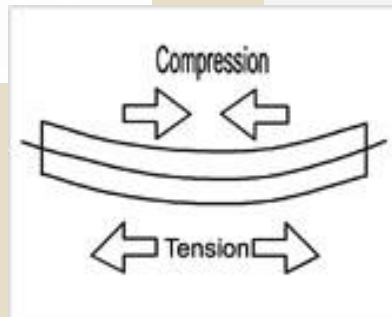
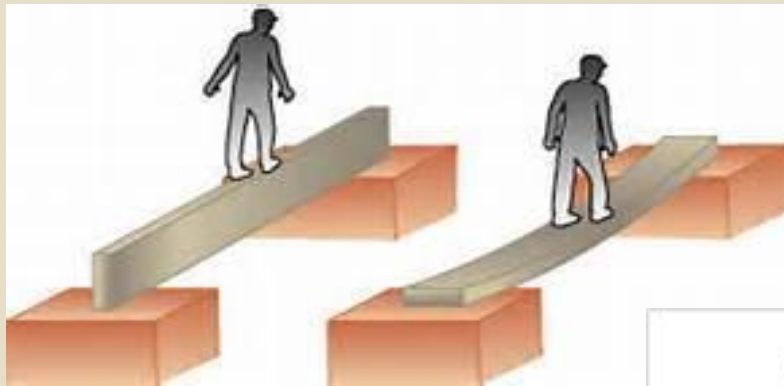
TRANSITION TO THE NINTH EDITION

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TRANSITION TO THE NINTH EDITION

R502.8.1 Sawn lumber. Notches in solid lumber joists, rafters and beams shall not exceed one-sixth of the depth of the member, shall not be longer than one-third of the depth of the member and shall not be located in the middle one-third of the span. Notches at the ends of the member shall not exceed one-fourth the depth of the member. The tension side of members 4 inches (102 mm) or greater in nominal thickness shall not be notched except at the ends of the members. The diameter of holes bored or cut into members shall not exceed one-third the depth of the member. Holes shall not be closer than 2 inches (51 mm) to the top or bottom of the member, or to any other hole located in the member. Where the member is also notched, the hole shall not be closer than 2 inches (51 mm) to the notch.



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R502.8.2 Engineered wood products. Cuts, notches and holes bored in trusses, structural composite lumber, structural glue-laminated members or I-joists are prohibited except where permitted by the manufacturer's recommendations or where the effects of such alterations are specifically considered in the design of the member by a *registered design professional*.

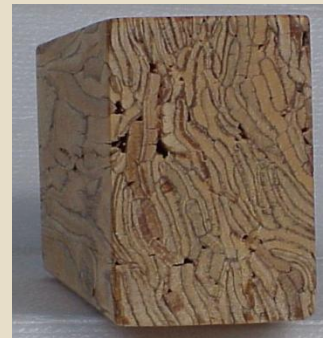


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Cutting and notching limitations for sawn lumber do not apply to engineered wood products. Structural composite lumber is a generic term which encompasses a variety of engineered composite wood products including laminated veneer lumber (LVL). Also included in the term are laminated strand lumber (LSL), parallel strand lumber (PSL), and oriented strand lumber (OSL).

Engineered wood products must not be cut, notched or bored unless those alterations are considered in the design of the member.

That consideration must come from either the manufacturer and be reflected in the use recommendations or from a registered design professional.



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- **R602.6 Drilling and notching-studs.** Drilling and notching of studs shall be in accordance with the following:
 1. Notching. Any stud in an exterior wall or bearing partition may be cut or notched to a depth not exceeding 25 percent of its width. Studs in nonbearing partitions may be notched to a depth not to exceed 40 percent of a single stud width.
 2. Drilling. Any stud may be bored or drilled, provided that the diameter of the resulting hole is no more than 60 percent of the stud width, the edge of the hole is no more than $\frac{5}{8}$ inch (16 mm) to the edge of the stud, and the hole is not located in the same section as a cut or notch. Studs located in exterior walls or bearing partitions drilled over 40 percent and up to 60 percent shall also be doubled with no more than two successive doubled studs bored. See Figures R602.6(1) and R602.6(2).

Exception: Use of *approved* stud shoes is permitted when they are installed in accordance with the manufacturer's recommendations.



TRANSITION TO THE NINTH EDITION

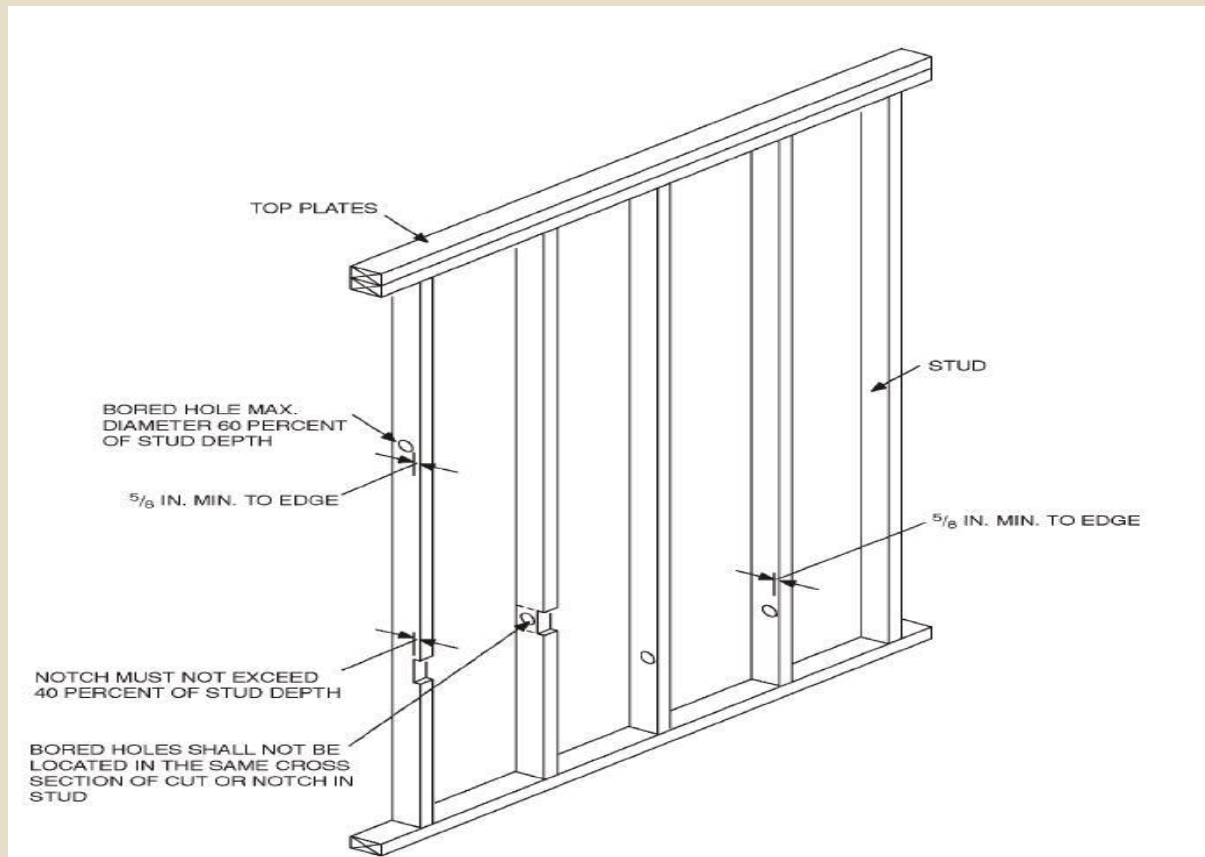
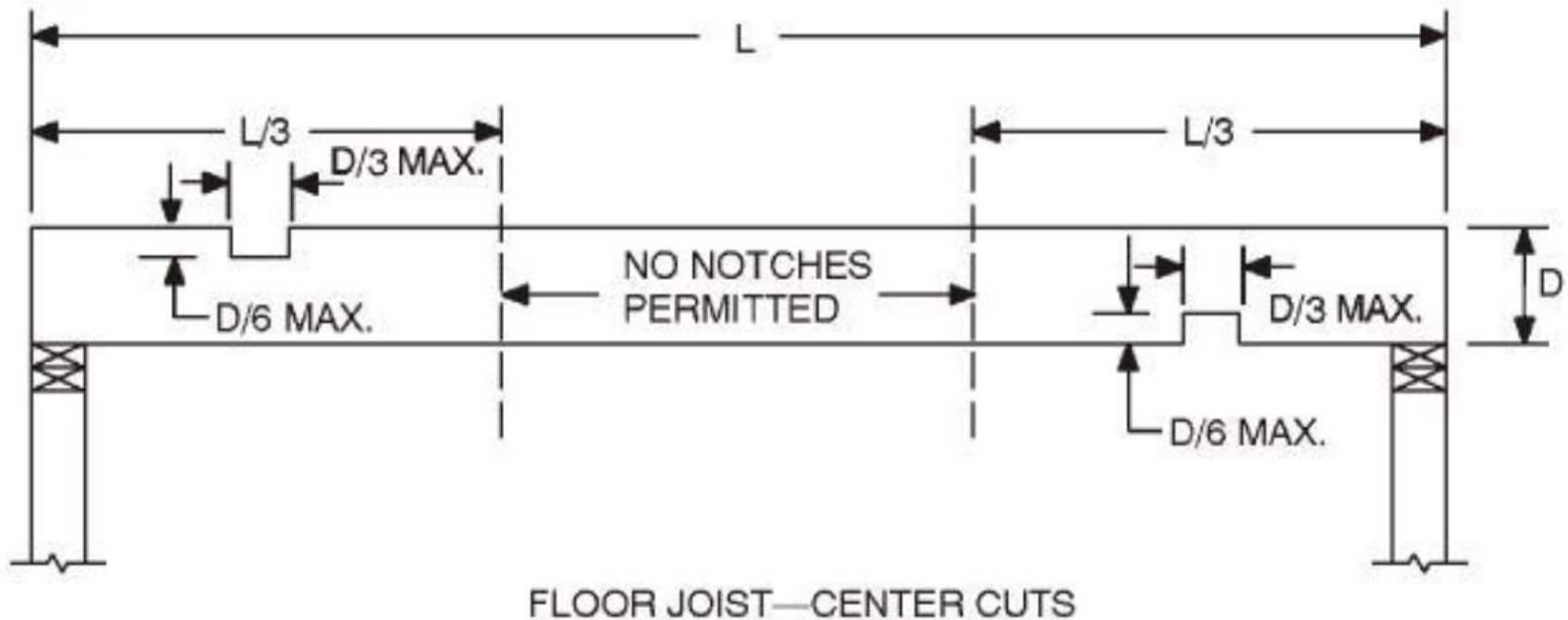


FIGURE R602.6(2) NOTCHING AND BORED HOLE LIMITATIONS FOR INTERIOR NONBEARING WALLS



TRANSITION TO THE NINTH EDITION

R502.8 Drilling and notching. **Structural floor members** shall not be cut, bored or notched in excess of the limitations specified in this section. See Figure R502.8.



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- **Drilling and Notching in Structural Insulated Panels R610.7** Drilling and notching provisions for structural insulated panels (SIP) are clarified.



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- **Glazing Adjacent to Doors R308.4.2** - Glazing installed perpendicular to a door in a closed position and within 24in of the door only requires safety glazing if it is on the hinge side of an in-swinging door.
- **Glazing and Wet Surfaces - R308.4.5** The exception from the safety glazing requirement for glazing that is 60 in. or greater from the water's edge of a bathtub, hot tub, spa, whirlpool, or swimming pool has been expanded to include glazing that is an equivalent distance from the edge of a shower, sauna, or steam room.





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- Section 3T Safety glazing materials; use in construction of buildings in hazardous locations; definitions for Sections 3U and 3V
- **Section 3T.** The following phrases, as used in sections three U and three V shall, unless the context requires otherwise, have the following meanings:?
- "Safety glazing material", any glazing material, such as tempered glass, laminated glass, wire glass or rigid plastic, which meets such test requirements as may be adopted by the department shall, insofar as possible, adhere to the American National Standards Institute standard ANSI Z97.1-1972 after notice and hearing as required by chapter thirty A, and which are so constructed, treated or combined with other materials as to minimize the likelihood of cutting and piercing injuries resulting from human contact with the glazing material.
- "Hazardous locations", means those installations, glazed or to be glazed in commercial and public buildings, known as framed or unframed glass entrance doors; and those installations, glazed or to be glazed in residential buildings and other structures used as dwellings, commercial buildings, and public buildings, known as sliding glass doors, storm doors, shower doors, bathtub enclosures, and fixed glazed panels adjacent to entrance and exit doors which because of their location present a barrier in the normal path traveled by persons going into or out of these buildings, and because of their size and design may be mistaken as means of ingress or egress; and any other installation, glazed or to be glazed, wherein the use of other than safety glazing materials would constitute an unreasonable hazard as the commissioner may determine after notice and hearing as required by said chapter thirty A, whether or not the glazing in such doors, panels, enclosures and other installations is transparent.

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- **MA AJI02.1 General.** Regardless of the category of work being performed, the work shall not cause the structure to become unsafe or adversely affect the performance of the building; shall not cause a **system regulated by this code to become unsafe**, hazardous, insanitary or overloaded; and unless expressly permitted by these provisions, shall not make the building any less compliant with this code or to any previously *approved* alternative arrangements than it was before the work was undertaken.

AJI02.3 Revise the section as follows:

- **MA AJI02.3 Smoke, Carbon Monoxide and Heat protection.** Smoke, carbon monoxide and heat protection shall be provided when required by this section and designed, located and installed in accordance with the provisions for new construction (see sections R314, R314.5, and R315).



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AJI02.3.1 through AJI02.3.3 Add the subsections as follows:

- **MA AJI02.3.1 Adding or creating one or more sleeping rooms.**
- **Single family dwelling.** When one or more sleeping rooms are added or created to an existing dwelling, the entire dwelling shall be provided with smoke, heat and carbon monoxide protection.
- **Two-family dwelling.** When one or more sleeping rooms are added or created to one *dwelling unit* that unit shall be provided with smoke, heat and carbon monoxide protection detectors. When sleeping rooms are added or created to both units the entire building shall be provided with smoke, heat and carbon monoxide protection.
- **Townhouses dwelling unit.** When one or more sleeping rooms are added or created to an existing *dwelling unit*, the entire unit shall be provided with smoke, heat and carbon monoxide protection.



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- **MA R314.8.1 Heat Detector Placement.** For flat-finished ceilings, the heat detector shall be placed on or near the center of the garage ceiling. For sloped ceilings having a rise to run of greater than one foot in eight feet (305 mm in 2438 mm), the heat detector shall be placed in the approximate center of the vaulted ceiling but no closer than four inches (102 mm) to any wall. Heat detection shall be listed in accordance with UL 521 or UL 539.

MA R314.9 Common areas. All common areas including basements and hallways/stairways in two family dwellings shall have smoke detector protection. Each detection device shall activate an alarm that provides audible notification installed in accordance with NFPA 72-2013: 18.4.5.



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- **Swimming Pools, Spas and Hot Tubs R326** -The design and construction of pools and spas shall comply with the International Swimming Pool and Spa Code (ISPSC). and the following notes:

MA Notes:

- Public and semi-public outdoor in-ground swimming pool enclosures shall conform to the requirements of M.G.L. c. 140, § 206.
- Also see 521 CMR 19.00: *Recreational Facilities*.
- Also see 105 CMR 430.00: *Minimum Standards for Recreational Camps for Children (State Sanitary Code, Chapter IV)* and 435.00: *Minimum Standards for Swimming Pools (State Sanitary Code: Chapter V)* as such regulate swimming pool requirements.
- Installation of electrical wiring and electrical devices shall be in accordance with 527 CMR.
- Installation of gas-fired pool heaters shall be in accordance with the Board of State Examiners of Plumber and Gas Fitters regulations at 248 CMR.
- Appendix G, Swimming Pools, Spas and Hot Tubs, has been deleted.



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- **Deck Ledger Connection to Band Joist R507.2**
The deck ledger section is reorganized to better describe the minimum requirements for connection of deck ledgers to band joists.
- **Alternative Deck Lateral Load Connection R507.2.4** When the prescriptive deck lateral load connection that has appeared in the previous editions of the code is chosen as a design option, the code now requires the two hold-down devices to be within 2 feet of the ends of the deck. A new lateral load connection option prescribes our hold-downs installed below the deck structure.



Department of Public Safety

Again, portions of this presentation are based on the International Code Council's Document Titled ***2015 IRC® Transition from the 2009 IRC®,*** which is used with kind permission of the ICC.

THANK YOU!

Robert Anderson

DPS Director of Construction Code Education

