

TIDBITS OF THE 2003  
INTERNATIONAL RESIDENTIAL  
AND 2003 INTERNATIONAL  
ENERGY CONSERVATION CODE.

This is for use as an informational booklet and shall not be used for interpretation of 1999 State Building code.

If there are any questions please contact the  
Monroe Building Department at 452-5470

Please read all information provided carefully. This is to help with your construction project. While there are many codes which may affect your project, tidbits is provided to help with the simpler, many times overlooked code requirements. Again please read carefully. If there are any questions pertaining to the tidbits sheet please call 452-5470.

**ATTENTION CONTRACTORS AND HOMEOWNERS  
PER THE NEW 2003 INTERNATIONAL ENERGY CODE  
ADOPTED ON SEPTEMBER 1, 2004**

All Persons wanting do construct additions to existing dwellings or new dwellings must submit with their applications a REScheck compliance certificate. NOTE: Depending on the extent of a remodel a REScheck may be required.

The REScheck compliance certificate must demonstrate compliance with the 2003 edition of the International Energy Code.

or

REScheck software is accessible on the Web site  
[www.energycodes.gov](http://www.energycodes.gov)

If you have any questions please contact the Monroe Building Department at 452-5470.

**ATTENTION CONTRACTORS AND HOMEOWNERS  
PER THE NEW 2003 INTERNATIONAL ENERGY CODE  
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**Minimum Duct Insulation:**

**In unconditioned attics or outside building:**

SUPPLY DUCTS ——— Insulation R-8 value applied  
RETURN DUCTS ——— Insulation R-4 value applied

**In Unconditioned Basements, Crawl Spaces, Garages, or Other Unconditioned Spaces:**

SUPPLY DUCTS ——— Insulation R-8 value applied  
RETURN DUCTS ——— Insulation R-2 value applied\*  
**(\*Insulation on return ducts in basements is not required )**

**Sealing Required:**

All joints, transverse seams, and connections in duct work, shall be securely fastened and sealed with welds, gaskets, mastics, or tapes. Tapes and mastics used to seal duct work shall be listed and labeled in accordance with UL 181A or UL 181B. Duct connections to flanges of air distribution system equipment shall be sealed and mechanically fastened. Unlisted duct tape is not permitted as a sealant on any metal ducts.

**NOTE:** The sealant and insulation must be applied as stated above. If the insulation is applied before inspection you will be asked to remove portions of the insulation on the duct work to show that all ducts have been sealed as required.

**Minimum Pipe Insulation for all HVAC systems:**

**HEATING SYSTEMS:**

Pipes with fluid temperature  
range from 106 degrees to  
200 degrees.

2 inch and less ---- 1 inch of insulation  
2.5 inch to 4 inch ---- 1 1/2 inch of insulation

Pipes with fluid temperature  
range from 201 degrees to  
250 degrees.

2 inch and less ---- 1 1/2 inches of insulation  
2.5 inch to 4 inch ---- 2 inches of insulation

**For piping exposed to outdoor air, increase insulation thickness by 0.5 inch.**

**Insulating of HVAC piping must be continuous from beginning to end including all interior heated spaces.**

## INSPECTIONS REQUIRED

Footings – When forms are in place and all soft materials inside the forms has been removed. Before concrete is poured.

Foundation Walls – Required when rebar is to be placed in wall. Before concrete.

Backfill – After foundation walls have been stripped of forms, ties broken off and holes **waterplugged inside and out**, foundation walls waterproofed from assumed grade level down to and including where footing meets wall, footing drains installed with a minimum of 6 inches of stone on top, 12 inches on the side and 2 inches of stone placed under pipe and covered with an approved filter fabric.

Slab – When anything (DWV, water pipes, Plenums, radiant heat) will be in or below slab. If plumbing is below grade then it must be filled with water with a 10 foot head and left until inspected. Any questions please call prior to pouring the slab.

Electrical Service – When service is installed and made weather tight.

Roughs – When house is framed and all mechanicals ( electric, plumbing, heating, gas, alarms etc.) are complete. If permits for any of the above inspections have not been taken out, then a rough inspection will not be done until all required permits have been issued.

Hearth Inspection – Before hearth is poured and it is formed and rebar is in place.

First Flue – After smoke chamber is complete and after first flue is in place.

Insulation – After house is made weather tight and all roughs have been approved.

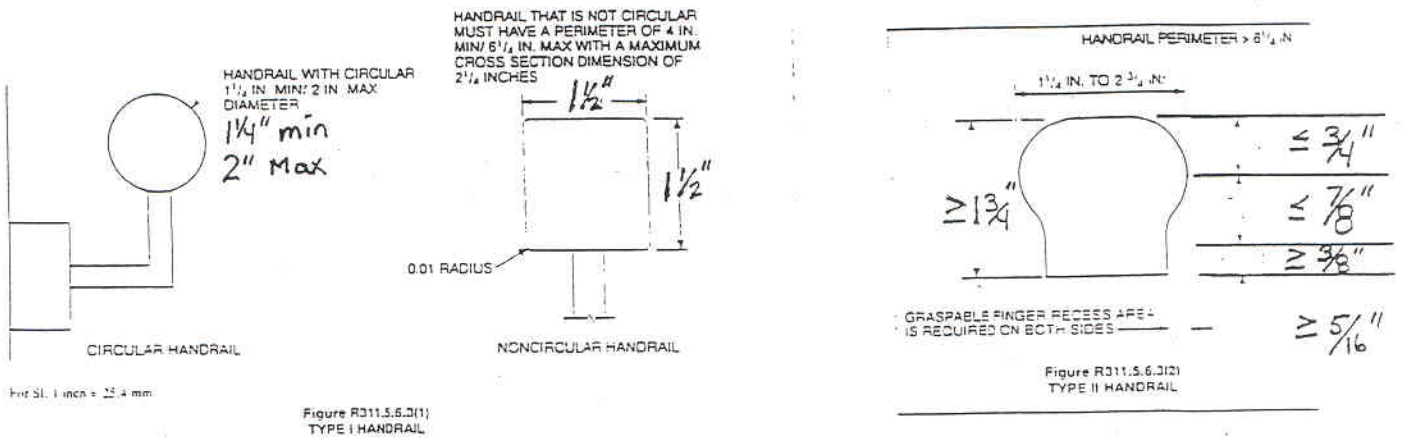
Certificate of Occupancy – When home is complete and ready to be occupied.

**HANDRAILS- R-311.5.6**

- Shall be 34" to 38" from nosing of stairs to top of railing.
- Shall be provided on at least one side of stairways of four or more risers.
- Shall be continuous for the full length of stairs.
- Ends shall be returned to wall or terminate into newel posts.
- A space of not less than 1-1/2" between handrail and wall

Type 1 handrails—with a circular cross section shall have an outside diameter of at least 1 1/4 inches and not greater than 2 inches. If the handrail is not circular it shall have a perimeter dimension of at least 4 inches and not greater than 6 1/4 inches with a maximum cross section of 2 1/4 inches.

Type 2 handrails—with a perimeter greater than 6 1/4 inches shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of 3/4 inch measured vertically from the tallest portion of the profile and achieve a depth of at least 7/8 inch below the widest portion of the profile. This required depth shall continue for at least 3/8 inch to a level that is not less than 1 1/4 inches below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 1/4 inches to a maximum of 2 3/4 inches. Edges shall have a minimum radius 0.01 inches.



**GUARDRAILS-315.3**

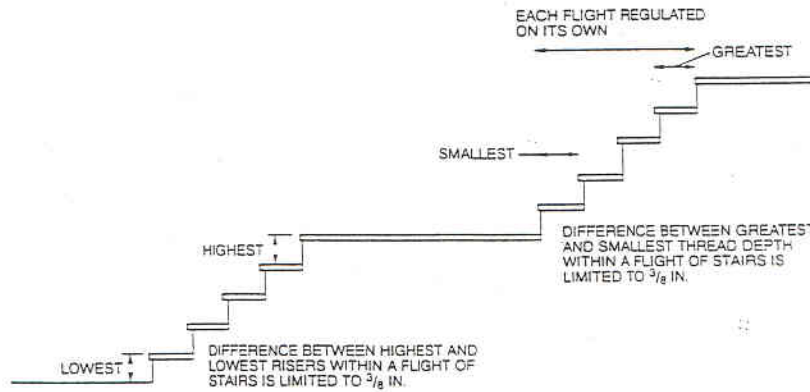
Porches, balconies, or raised floor surfaces located more than 30" above the floor or grade below shall have guardrails not less than 36" in height. Open sides of stairs with a total rise of more than 30" above floor or grade shall have guardrails not less than 34". Guardrails shall not to allow passage of an object of 4 inches or more in diameter.

**STAIRS -R 311.5**

Max. height of riser 8-1/4 inches. The riser shall be measured vertically between leading edges of adjacent treads.

**Exception-**the maximum height of existing stairs serving existing unfinished attics or basements being converted to habitable space shall be 9 inches, measured as above

Riser height difference within any flight of stairs shall not exceed the smallest by more than 3/8 of an inch.

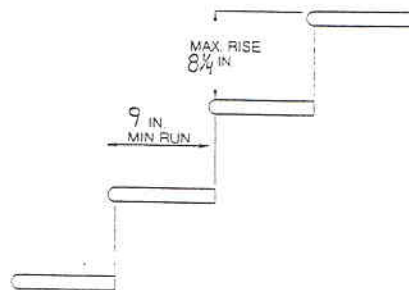


The minimum tread depth shall be 9 inches. The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the treads leading edge.

**Exception-**the minimum tread depth of existing stairs serving existing unfinished attics or basements being converted to habitable space shall be 8 inches, measured as above

A nosing not less than 3/4" but not more than 1-1/4ins, shall be provided on stairways with solid risers. Open risers are permitted, provided that the opening between the treads does not allow passage of a 4 inch diameter sphere.

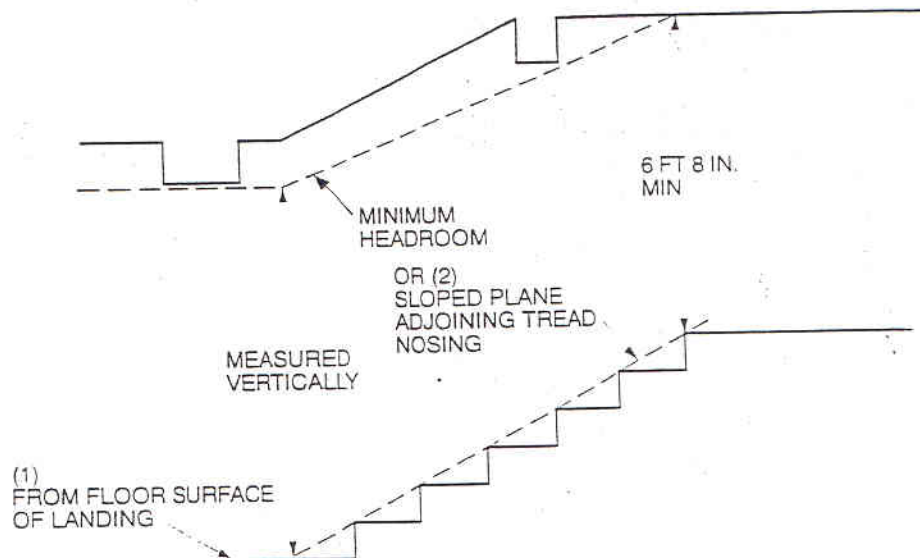
**Exception-** a nosing is not required where the tread depth is a minimum of 11". The openings between adjacent treads is not limited on stairs with a total rise of 30 inches or less.



### STAIRWAY WIDTHS R311.5

Stairways shall not be less than 36 inches in clear width at all points above the permitted rail height and below the required headroom height. Handrails shall not extend more than 4 ½ inches on either side of the stairway and the minimum clear width of stairway at and below the handrail height, including treads and landings, shall not be less than 31 ½ inches where a handrail is installed on one side and 27 where handrails are provided on both sides.

**HEADROOM-** The minimum headroom in all parts of the stairway shall not be less than 6 foot 8 inches measured vertically from the sloped plane adjoining the tread nosing or from the floor surface of the landing or platform.



### LANDINGS AT EXTERIOR DOORS-R311.4.3

There shall be a floor or landing a minimum of 3 feet in the direction of travel and 3 feet in width, or a width equal to the width of any adjacent stair, whichever is greater, on each side of each exterior door. The landing on the exterior side of doors shall not be more than 8-1/4 inches below the top of the threshold provided that the door, other than an exterior storm or screen door, does not swing over the landing. In the event that the door, other than an exterior storm or screened door, swings over the landing, the landing shall not be more than 1.5 inches below the top of the threshold.

**Exception-**at other than the required exit door, a landing is not required for the exterior side of the door where a stairway of 3 or fewer risers, including the top riser from the dwelling to the top tread, is located on the exterior side of a door.

### FIREBLOCKING- R602.8

Effective fire barriers consisting of 2" nominal lumber or other shall be provided between stories, and between a top story and the roof space. Firestopping shall be provided in wood frame construction in the following locations:

1. concealed spaces of stud walls and partitions including furred spaces and parallel rows of studs or staggered studs; as follows:
  - a. Vertically at the ceiling and floor levels.
  - b. Horizontally at intervals not exceeding 10 feet
2. at all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings, cove ceilings, ext....
3. in concealed spaces between stair stringers at the top and bottom of the run
4. at openings around vents, pipes, ducts at ceiling and floor level, with approved material to resist the free passage of flame and products of combustion.

**THE INTEGRITY OF ALL FIRESTOPS SHALL BE MAINTAINED.**

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#### FIREPLACE CLEARANCES-R1003.11

Wood framing shall not be placed within 2" of the outside face of a masonry fireplace and not less than 6" from the inside surface of the nearest flue lining. Also not within 4" of the back surface of the fireplace.

Woodwork such as mantel and trim which is comprised of combustible materials shall not be placed within 6" of a fireplace opening. Combustibles within 12" of fireplace opening shall not project more than 1/8 inch for each inch of distance from opening

#### FACTORY BUILT FIREPLACES-1004

Shall be listed and labeled and shall be installed in accordance with the conditions of the listing.

#### FOUNDATIONS-R401

\* Wood foundation materials require 0.60 retention. Decks, pole Barns Etc.

\* Freestanding accessory structures with an area of 400 square feet or less and an eve height of 10 feet or less shall not be required to be protected.

\*Decks not supported by a dwelling need not be provided with footings that extend below the frost line.

\***Design Required-** A design in accordance with accepted engineering practice shall be provided for concrete or masonry foundation walls when any of the following conditions exist:

1. Walls are subject to hydrostatic pressure from groundwater
2. Walls supporting more than 48 inches of unbalanced backfill that do not have permanent lateral support at top and bottom. (this applies to all steps in foundation)

\*Access shall be provided to all under floor spaces. Access openings through the floor shall be a minimum of 18 inches by 24 inches. Openings through a perimeter wall shall be 16 inches by 24 inches. When any portion of the through wall access is below grade, an areaway of not less than 16 inches by 24 inches shall be provided. If mechanical equipment is located in the under floor space then an opening must be provided for the removal of the largest appliance, but not less than 30 inches high and 22 inches wide.

\*If the house site requires blasting, then the blasted material must be removed. Do not put forms on blasted material. Engineering is required when forming on blasted material.

\*Do not over excavate and try to make up the difference using stone, this may be an added expense that will have to be removed. If you think you need stone and not much, call the Building Department first. Engineering may still be required.

\*All soft material must be removed (whether it's 2" or 8") down to good solid material. The shovel on an excavator has teeth 6 plus or minus inches long. When digging, these teeth create 6" of soft material that **MUST** be removed.

\*Do not call for a footing inspection at 2:00 p.m. and have concrete ordered to arrive at 3:00 p.m. The footing inspection may not be approved. The Building Official will not be put in a predicament. If the footing inspection is not approved then the concrete contractor can not be pour.

Be careful, if foundation walls exceed 8 feet, Engineering may be required depending on the height of unbalanced fill. Any questions please contact the Building Department.



#### **CHIMNEY FIREBLOCKING- R1001.16**

All spaces between chimneys and floors and ceilings through which chimneys pass shall be fireblocked with noncombustible material securely fastened in place. The fireblocking of spaces between chimneys and wood joists, beams or headers shall be to a depth of 1 inch and shall only be placed on strips of metal or metal lath laid across the spaces between combustible material and the chimney.

#### **SAFETY GLASS R308.4**

Any window over 9 square feet with the bottom edge less than 18" to floor, the top edge greater than 36 inches above the floor and one or more walking surfaces within 36 inches horizontally is to be safety glass.

Windows and any glass in the tub and shower area shall be safety glass where the bottom edge of glazing is less than 60 inches above standing surface.

Glazing adjacent to stairways, landings and ramps within 36 inches horizontally of a walking surface when the exposed surface of the glass is less than 60 inches above the plane of the adjacent walking surface.

Glazing adjacent to stairways within 60 inches horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glass is less than 60 inches above the nose of the tread.

Glazing, in an individual fixed or operable panel adjacent to a door where the nearest vertical edge is within a 24 inch arc of the door in a closed position and whose bottom edge is less than 60 inches above the floor or walking surface.

#### **SMOKE DETECTOR REQUIRED-R313**

Smoke detectors shall be installed in each sleeping room, outside of each separate sleeping area in the immediate vicinity of the bedrooms and on each additional story of the dwelling, including basements but not including crawl spaces and uninhabitable attics. All detectors shall be interconnected and shall receive their primary power from the building wiring. When the primary power is interrupted the detector shall receive its power from a battery.

#### **MASONRY CHIMNEYS and FIREPLACES- R1001**

When there are two or more flues a masonry wythe of at least 4 inches shall be built between them and bonded into the walls of the chimney.

**Exception:** when venting only one appliance, two flues may adjoin each other.

Joints of each flue shall be staggered at least 7 inches.

Chimneys located in the interior of the building or within the exterior wall of the building shall have a minimum air space clearance to combustibles of at least 2 inches.

Chimneys located entirely outside the exterior walls including chimneys that pass through the soffit or cornice shall have a minimum air space clearance of 1 inch.

The air space shall not be filled except to provide firestopping.

Chimneys shall be provided with crickets where needed. The intersection of the cricket and chimney shall be flashed. Crickets shall be the full width of the chimney and the height determined by the pitch/ width ratio.  $12/12 = \frac{1}{2} w$ ,  $8/12 = \frac{1}{3} w$ ,  $6/12 = \frac{1}{4} w$ ,  $4/12 = \frac{1}{6} w$ ,  $3/12 = \frac{1}{8} w$ .

#### **HEARTH EXT. MATERIAL-1003.9**

Extensions shall be of masonry or concrete at least two inches thick and supported by non-combustible materials. Combustible forms used during construction of the hearth extension shall be removed

#### **HEARTH EXTENSION-1003.10**

The hearth extension shall extend a minimum of 16 inches in front of and at least 8 inches beyond each side of fireplace opening.

When fireplace opening is 6 square feet or greater the hearth shall extend at least 20 inches in front of and at least 12 inches each side

### GARAGES/CARPORTS-R309

\*Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than 1-3/8 inches in thickness, solid or honeycomb core steel doors not less than 1-3/8 inches in thickness or 20 minute fire rated doors in solid wood jambs. Doors between the garage and residence shall be equipped with self closing device.

\*Garages attached side by side to residences shall be separated from the residence and its attic area by 5/8 type X gypsum board applied to the garage side. Garages beneath habitable rooms closets, bathrooms, toilet rooms, halls or utility spaces in residences shall be separated from adjacent interior spaces by 5/8 type X gypsum board applied to the garage side of all walls, ceilings and combustible structural supports. Joints shall be finished in accordance with the manufacturer's requirements.

**EXCEPTION: Wood structural members of the minimum dimensions specified in section 2304.0 of the BOCA national building code/1996 portion of the 1999 State Building Code for type 4 construction shall be acceptable without further protection.**

\*Asphalt Floors are allowed in carports at ground level but not in garages.

\*Ducts in garages and penetrating house/garage walls shall be 27 gage sheet steel with no openings into the garage.

### ROOF COVERINGS R905

\*Asphalt shingles shall be fastened to solidly sheath decks.

\*Asphalt shingles shall only be used on roof slopes of 2:12 or greater. When using asphalt shingles on slopes of between 2:12 and 4:12 double underlayment is required.

\*Asphalt shingles shall have the minimum number of fasteners required by the manufacturer, For normal application, asphalt shingles shall be secured to the roof with not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 20:12 horizontal asphalt shingles shall be secured to the roof in accordance with the manufactures special installation instructions or, in the absence of such instructions, with not less than 6 fasteners per strip shingle or 3 fasteners per individual shingle.

\*Ice Protection- Ice and water shield underlayment shall be used and extend from the eaves edge to a point at least 24 inches inside the exterior wall line of the building.

## **BUILDING PLANNING-R300**

- \***Bathroom exhaust-** If no 1 ½ square foot operable window, mechanical ventilation is required. Intermittent (switched)=50 cfm's required; Continuous = 20 cfm's required
- \***Stairway illumination-** all interior and exterior stairways shall be provided with a means to illuminate the stairs, including the landings and the treads. Control for the activation of the required interior stairway lighting shall be accessible at the top and bottom of each stairway without traversing any steps. The illumination of the exterior stairways shall be controlled from inside the dwelling unit. Exterior stairways providing access to a basement from an outside grade level shall be provided with an artificial light source at the bottom landing of the stairway.
- \***Required Heating-** cannot be achieved through the use of portable space heaters.
- \***Bathroom Ceiling heights-** shall have a minimum height of 6 foot 8 inches over the fixture and at the required clearance in front of the fixture. Showers and tubs with showers need 6 feet 8 inches at a minimum 30 inch by 30 inch space at the shower head.
- \***Premises Identification-** Approved numbers or addresses shall be provided for all new buildings in such a position as to be plainly visible and legible from the street or road fronting the property.
- \***Attic Access-** opening shall be provided to attic areas that exceed 30 square feet and have a vertical height of 30 inches or greater. The opening shall not be less than 22 inches by 33 inches and shall be located in a hallway or other readily accessible location. A 30 inch minimum unobstructed headroom in the attic space shall be provided at some point above the opening.

## **EMERGENCY ESCAPE/RESCUE OPENING-R310**

- \*Basements with habitable space and every sleeping room within the dwelling shall have at least one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, emergency and rescue openings shall be required in each sleeping room, but shall not be required in adjoining habitable areas of the basement. Where emergency escape and rescue openings are provided, they shall have a sill height of not more than 44 inches above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and the rescue opening is provided with a bulkhead enclosure the enclosure shall comply with section 310.3 (inquire). Emergency escape and rescue openings with a finished sill height below the adjacent ground elevation shall be provided with a window well in accordance with section R310.2 (inquire).

**EXCEPTION: 1. Habitable basements without sleeping rooms are not required to have emergency escape and rescue openings when they are provided with two remote, code-compliant stairways.**

**2. In existing buildings, basements being converted to habitable space without sleeping rooms are not required to have emergency escape and rescue openings.**

- \*All emergency escape and rescue openings shall have a minimum net clear opening of 5.7 S.F.

**EXCEPTION: Openings whose bottom edge is within 44 inches of exterior grade shall have a minimum net clear opening of 5 square feet.**

- \*Emergency and escape rescue openings shall be operational from the inside of the room without the use of a key or tool and the net clear opening dimensions shall be obtained by the normal operation of the opening from the inside. In other words no more tilt and takeout sashes to achieve the minimum net clear opening.

**EXCEPTION: Existing buildings undergoing alterations or installation of replacement windows shall be permitted to utilize removable sash to achieve the required minimum net clear openings. Such removable sash shall be capable of being removed without the use of a key or tool.**

## GROUNDFAULT CIRCUIT INTERRUPTER PROTECTION 210-8

**\*DWELLING UNITS-** All 125-volt, single phase, 15 and 20 ampere receptacles installed in the locations specified in 1 through 8 shall have ground-fault circuit interrupter protection.

1. Bathrooms
2. Garages and also accessory buildings that have a floor located at or below grade level not intended as habitable rooms and limited to storage areas.

**EXCEPTION #1.** Receptacles that are not readily accessible.

**EXCEPTION #2.** A single receptacle or a duplex receptacle for two appliances located within dedicated space for each appliance that, in normal use, is not easily moved from one place to another and that is cord and plug connected.

3. Outdoors
4. Crawl Spaces- at or below grade
5. Unfinished Basements

**EXCEPTION #1.** Receptacles that are not readily accessible.

**EXCEPTION #2.** A single receptacle or a duplex receptacle for two appliances located within dedicated space for each appliance that, in normal use, is not easily moved from one place to another and that is cord and plug connected.

**EXCEPTION #3.** A receptacle supplying only a permanently installed fire alarm or burglar alarm system shall not be required to have GFCI protection.

6. Kitchens – where the receptacles are installed to serve the counter top surface.
7. Wet Bar Sinks – where the receptacles are installed to serve the counter top surfaces and are located within 6 feet of the outside edge of the wet bar sink.
8. Boathouses

**\*OTHER THAN DWELLING UNITS-** All 125-volt, single phase, 15 and 20 ampere receptacles installed in the locations specified in 1 through 8 shall have ground-fault circuit interrupter protection.

1. Bathrooms
2. Rooftops
3. Kitchens
4. All locations within 6 feet of the outside edge of a sink or lavatory. (AMD)

## ARC-FAULT CIRCUIT INTERRUPTER PROTECTION 210-12

**\*Definition-** An arc-fault circuit interrupter is a device to provide protection from the affects of arc faults by recognizing characteristics unique to arcing and by functioning to de-energize the circuit when an arc fault is detected.

**\*Dwelling Unit Bedrooms-** All branch circuits that supply 125 volt, single-phase, 15 and 20 amp outlets installed in dwelling unit bedrooms shall be protected by an arc-fault circuit interrupter listed to provide protection of the entire branch circuit. **OUTLET is a point on the wiring system at which current is taken to supply utilization equipment. SMOKE DETECTORS are not required to be on the Arc-fault circuit.**

**\*Hydromassage Bathtubs 680.73-** electrical equipment shall be accessible without damaging the building structure or building finish. Ground Fault Circuit Interrupter Devices shall be located in a readily accessible location for testing purposes. Ground fault devices shall not be installed within the enclosure of the hydromassage bathtub.

## DWELLING UNIT RECEPTACLE OUTLETS 210.52

### GENERAL PROVISIONS:

- \*Receptacles shall be installed so that no point measured horizontally along the floor line in any wall space is more than 6 feet from a receptacle outlet.
- \*A wall space is any space 2 feet or more in width and unbroken along the floor line by doorways, fireplaces, and similar openings.
- \*Floor receptacle outlets in floors shall not be counted as part of the required number of receptacle outlets unless located within 18 inches of the wall.

### SMALL APPLIANCES:

- \*In the kitchen, pantry, breakfast room, dining room, or similar area of a dwelling unit, the two or more 20 amp small appliance branch circuits required by 210.11 shall serve all receptacle outlets covered by 210.52 (A) and (C) and receptacle outlets of refrigeration equipment.
- \*The two or more small-appliance branch circuits specified in 210.52 shall have no other outlets.
- \*Kitchen receptacle outlets installed to serve countertop surfaces shall be supplied by not fewer than two small appliance branch circuits, either or both of which shall also be permitted to supply receptacle outlets in the same kitchen and in other rooms as specified in 210.52(B)(1). Additional small appliance branch circuits shall be permitted to supply receptacle outlets in the kitchen and other rooms specified in 210.52(B)(1). No small appliance branch circuit shall serve more than one kitchen.

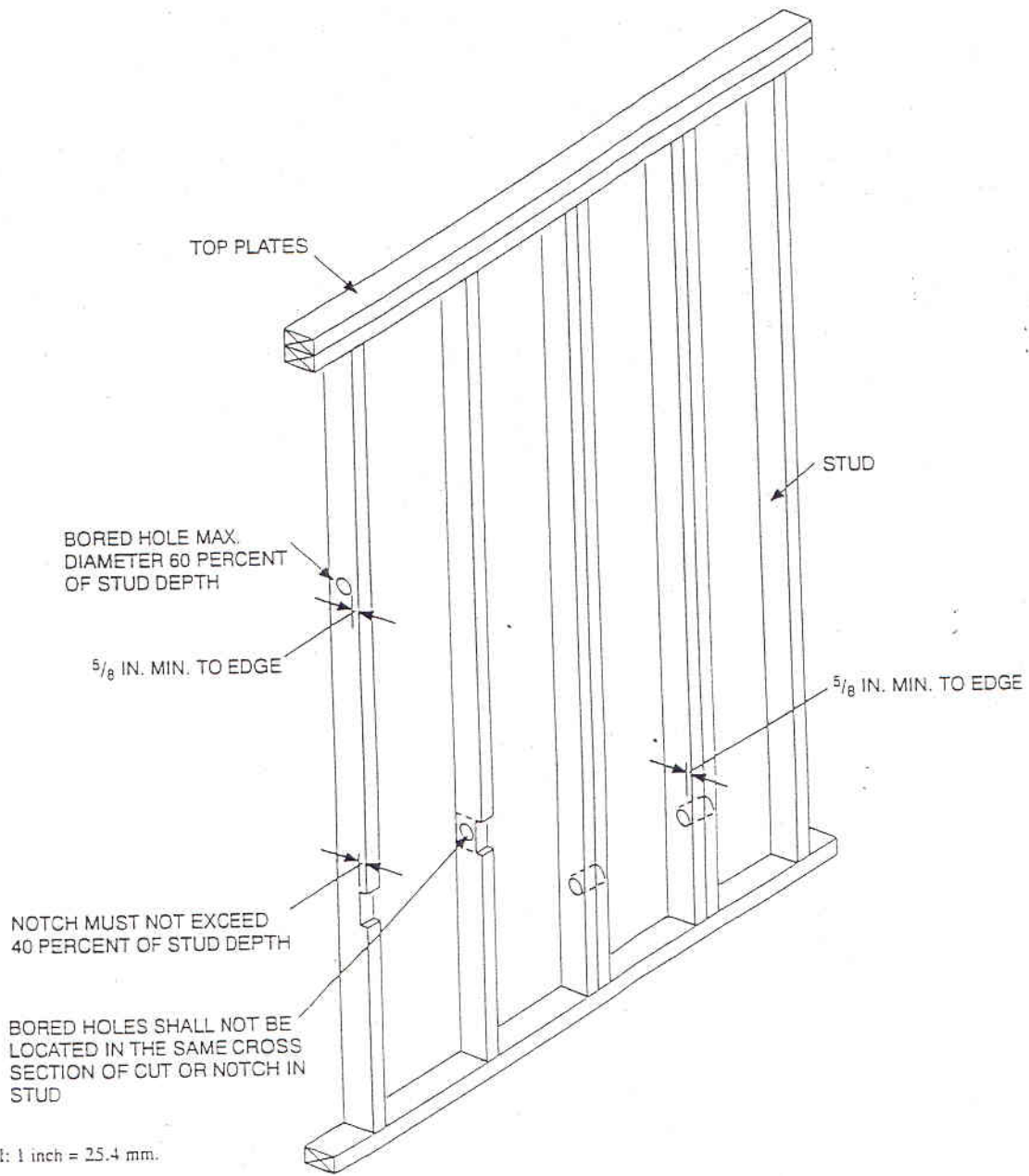
### COUNTERTOPS:

- \***Wall counter spaces-** A receptacle outlet shall be installed at each wall counter space that is 12 inches or wider. Receptacle outlets shall be installed so that no point along the wall line is more than 24 inches measured horizontally from a receptacle outlet in that space.
- \***Island counter spaces-** At least one receptacle outlet shall be installed at each island counter space with a long dimension of 24 inches or greater and a short dimension of 12 inches or greater.
- \***Peninsular counter spaces-** At least one receptacle outlet shall be installed at each peninsular counter space with a long dimension of 24 inches or greater and a short dimension of 12 inches or greater. A peninsular countertop is measured from the connecting edge.
- \***Separate spaces-** Countertop spaces separated by range tops, refrigerators, or sinks shall be considered as separate countertop spaces in applying the requirements of 210.52(C)(1), (2), and (3).
- \***Receptacle outlet location-** Receptacle outlets shall be located above, but not more than 20 inches the countertop. Receptacle outlets rendered not readily accessible by appliances fastened in place, appliance garages, or appliances occupying dedicated space shall not be considered as these required outlets.
- \***Bathrooms-** In dwelling units, at least one wall receptacle outlet shall be installed in bathrooms within 3 feet of the outside edge of the basin. The receptacle outlet shall be located on a wall or partition that is adjacent to the basin or basin countertop. At least one 20 amp branch circuit shall be provided to supply the bathroom receptacle outlet (s). Such circuits shall have no other outlets.

**EXCEPTION:** Where the 20 amp circuit supplies a single bathroom, outlets for other equipment within the same bathroom shall be permitted to be supplied in accordance with 210.23 (A).

210.23(A)- A 15 or 20 amp branch circuit shall be permitted to supply lighting units or other utilization equipment, or a combination of both.

- \***Outdoor Outlets-** For a one family dwelling and each unit of a two family dwelling that is at grade level, at least one receptacle outlet accessible at grade level and not more than 6 1/2 feet above grade shall be installed at the front and back of the dwelling.
- \***Laundry areas-** In dwelling units, at least one receptacle outlet shall be installed in the laundry area. This receptacle must be a 20 amp circuit and shall have no other outlets on that circuit.
- \***Basements and Garages-** For a one family dwelling, at least one receptacle outlet, in addition to any provided for laundry equipment, shall be installed in each basement and in each attached garage with electric power. Where a portion of the basement is finished into one or more habitable rooms, each separate unfinished portion shall have a receptacle outlet installed in accordance with this sect.
- \***Hallways-** In dwelling units, hallways of 10 feet or more in length shall have at least one receptacle outlet. The hall shall be considered the length along the centerline of the hall without passing through a doorway.



For St: 1 inch = 25.4 mm.

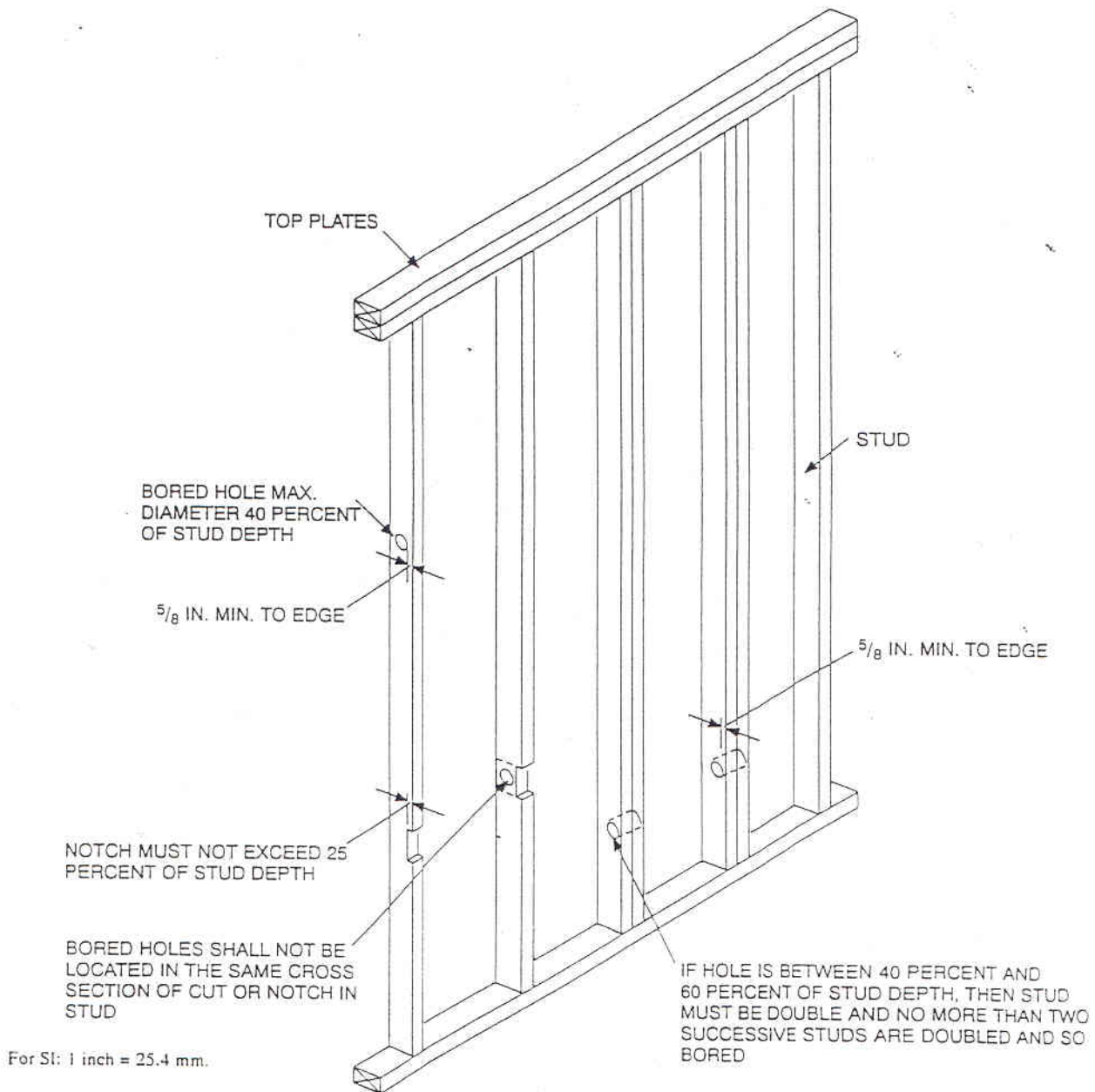
FIGURE R602.6(2)  
 NOTCHING AND BORED HOLE LIMITATIONS FOR INTERIOR NONBEARING WALLS

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**R602.6 Drilling and notching—studs.** 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. Any stud may be bored or drilled, provided that the diameter of the resulting hole is no greater than 40 percent of the stud width, the edge of the hole is no closer than  $\frac{5}{8}$  inch (15.9 mm) to the edge of the stud, and the hole is not located in the same section as a cut or notch. See Figures R602.6(1) and R602.6(2).

**Exceptions:**

1. A stud may be bored to a diameter not exceeding 60 percent of its width, provided that such studs located in exterior walls or bearing partitions are doubled and that not more than two successive studs are bored.
  2. Approved stud shoes may be used when installed in accordance with the manufacturer's recommendation.
- ❖ This section addresses the allowable drilling and notching of studs used to frame partitions. See Figures R602.6(1) and R602.6(2) for examples of permitted drilling and notching of studs in exterior walls, bearing walls and nonbearing walls. These limitations retain the structural integrity of the studs.



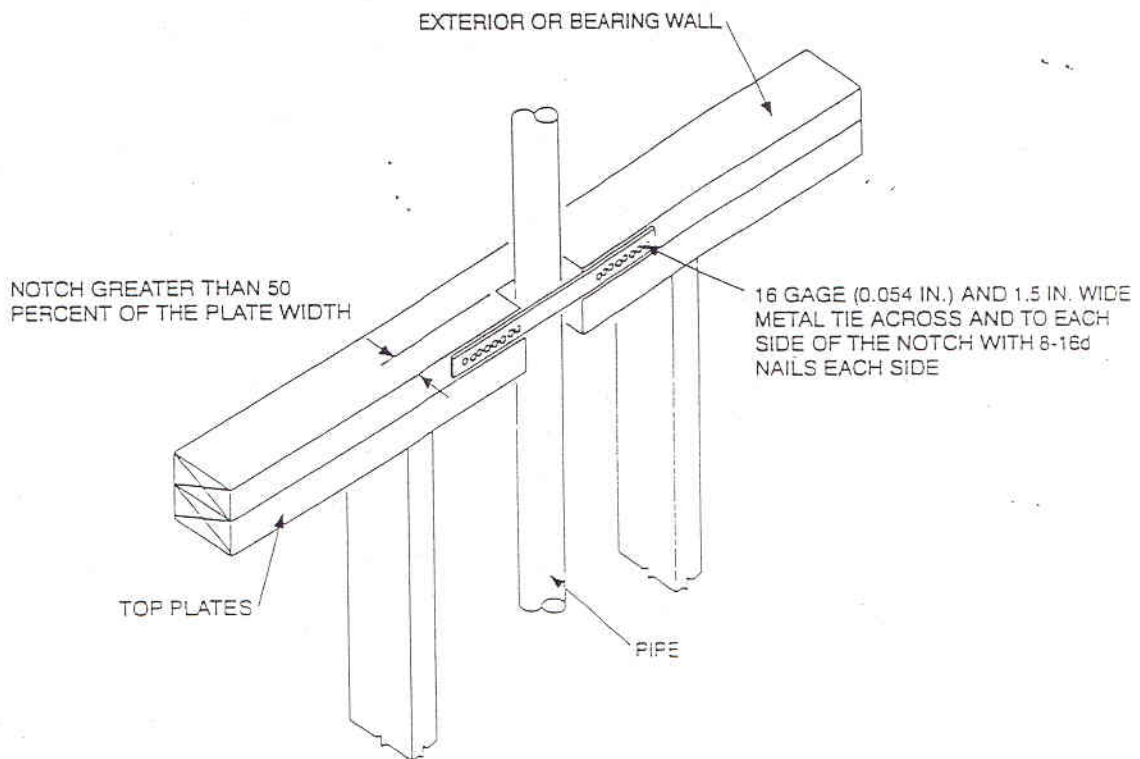
Note: Condition for exterior and bearing walls.

FIGURE R602.6(1)  
NOTCHING AND BORED HOLE LIMITATIONS FOR EXTERIOR WALLS AND BEARING WALLS

**R602.6.1 Drilling and notching of top plate.** When piping or ductwork is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie of not less than 0.054 inches thick (1.37mm) (16ga) and 1½ inches (38mm) wide shall be fastened to each plate across and to each side of the opening with not less than eight 16d nails at each side or equivalent. See Figure R602.6.1.

**Exception:** When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing.

In many cases, drilling or notching of the top plate is necessary to allow plumbing, heating or other pipes to be placed within the exterior walls and load-bearing interior walls. When drilling or notching the top plate by more than one-half its width is necessary, strapping across the plates as illustrated in Figure R602.6.1 is required to provide top plate continuity and to retain the structural integrity of the wall system as a whole. In the case of a double top plate, only the upper of the two plates needs to have a strap installed as described.



For SI: 1 inch = 25.4 mm.

FIGURE R602.6.1  
TOP PLATE FRAMING TO ACCOMMODATE PIPING



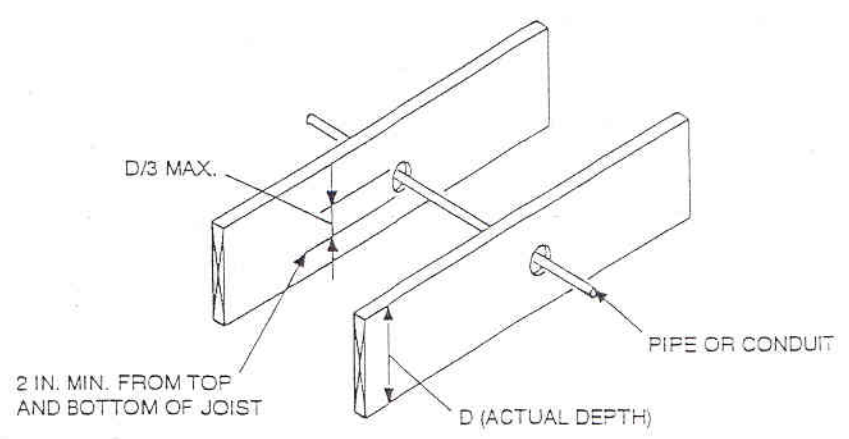
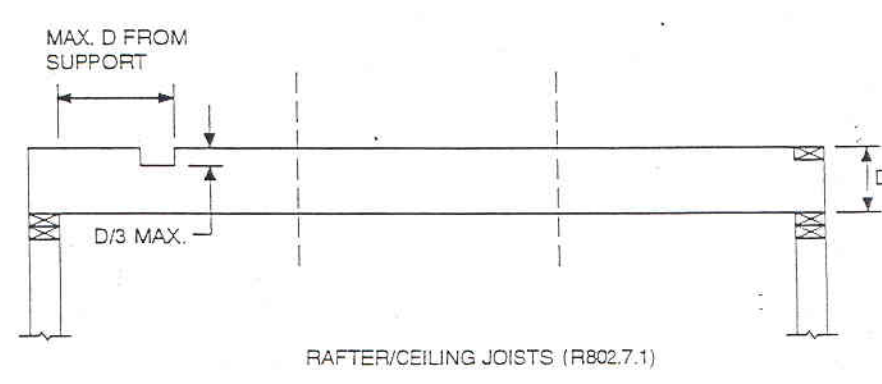
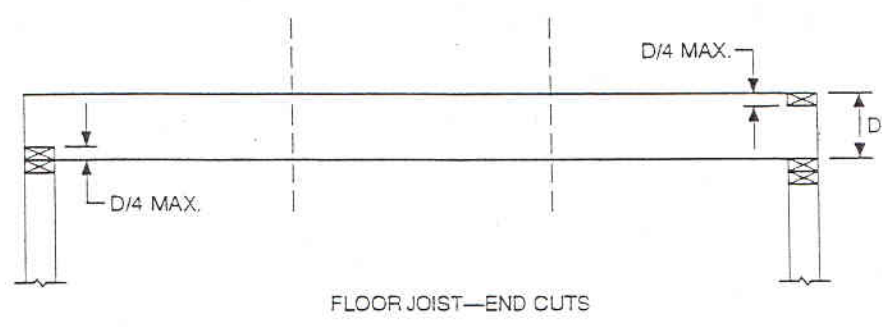
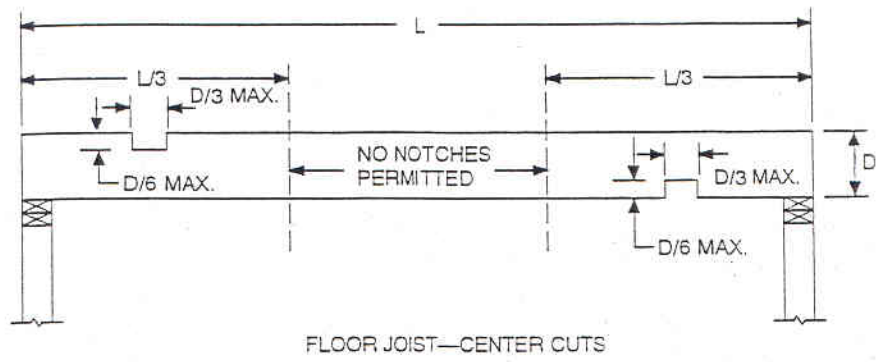


FIGURE R502.8  
CUTTING, NOTCHING AND DRILLING

**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.

- ❖ Some designs and installation practices require that limited notching and cutting occur. Notching should be avoided when possible, and holes bored in beams and joists create the same problems as notches. When necessary, the holes should be located in areas with the least stress concentration, generally along the neutral axis of the joist. Limitations on the allowable cutting and notching of wood floor joists are meant to retain structural or functional integrity.

**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.

- ❖ Cutting and notching limitations are illustrated in Figure R502.8. Additionally, the tension side of members with a thickness of 4 inches (102 mm) or more can be notched at the ends only. See the commentary for Section R502.8.

**R502.8.2 Engineered wood products.** Cuts, notches and holes bored in trusses, laminated veneer lumber, glue-laminated members or I-joists are not permitted unless the effects of such penetrations are specifically considered in the design of the member.

Cutting and notching limitations for sawn lumber do not apply to engineered wood products. The code does not allow drilling and notching of engineered wood products without documentation that the design has taken this possibility into account.

See Diagram on other side.

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