

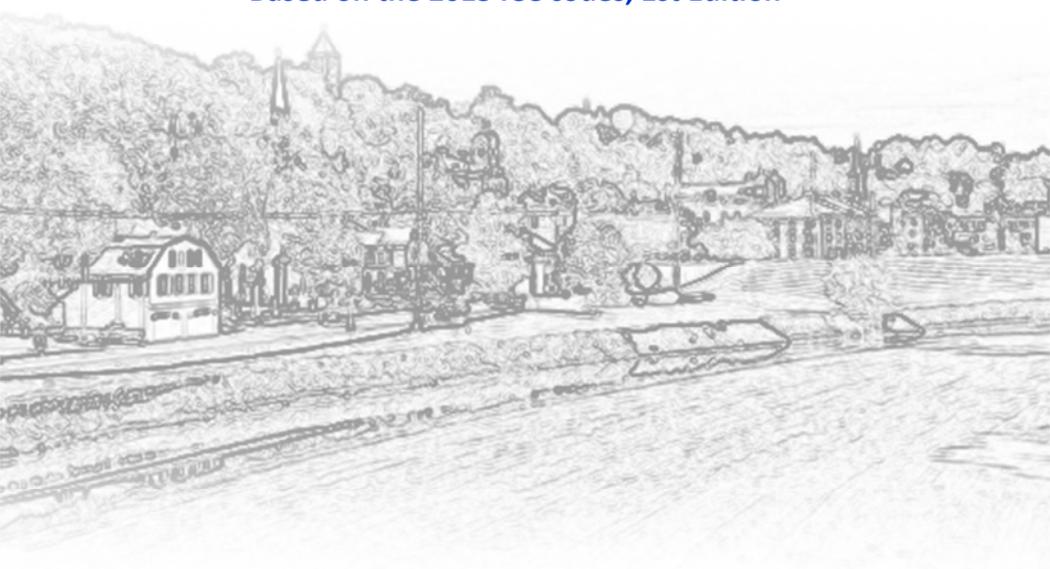


Building Basics:

Contractor Handbook

A GUIDE TO THE BUILDING CODE OF GALENA, ILLINOIS

Based on the 2015 ICC codes, 1st Edition



September 23, 2016

Forward

This book is not the code. It is a representation and interpretation of the International Code Council codes as adopted by the City of Galena. It primarily covers the International Residential Code. It was developed as an informational booklet for contractors, intended to aid in the compliance with the building code.

This book will cover some of the most often asked code questions and common code mistakes that affect this area.

If there is a specific question or situation where there may be differences between this book and the building code, always follow the code.

Respectfully,

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Permits

In accordance with Section 150.04 of the City of Galena Ordinance: No person shall erect, alter, enlarge, repair, convert, move, remove, raise, lower, underpin, or demolish any building or structure within the city; nor shall any person construct, alter, or repair or remove the fixtures of any building, structure or premises without first obtaining a permit from the Building Department to do so.

Except for buildings and accessory buildings already on the city sewer and water, no building permit shall be issued to any person or contractor of a new building or structure until the sewer and water connection fees have been paid.

Maintenance and repair work in conformance with section 150.22 of the City of Galena Ordinance is exempt from building permits.

Any exterior work in the Galena Historic District must conform to the city's historic preservation ordinance.

All permits expire six months from the date of issuance, but can be renewed for an additional six months at no additional charge.

Building permits may be issued to contractors that are registered with the city, and to a homeowner that is doing his/her own work.

The City of Galena does not currently permit any plumbing work.

Inspections

All construction work for which a permit is required shall be subject to inspections by the City Building, Electrical and/or Fire Inspector(s). All Such work shall remain accessible and exposed for inspection purposes until approval to cover is given by the Building Official. All building, electrical, HVAC, fire, and life safety inspections will be completed by the City of Galena Building Official and Staff.

For any Plumbing inspections, please call the Illinois Department of Public Health at (815)987-7511.

Inspections (cont'd)

It is the responsibility of the permit applicant or contractor to contact the Building Department and request all necessary inspections. Inspections require at least 24 hours notice. Proceeding to the next phase of construction without an inspection or the approval of the Building Department is a violation, and the Building Official, Electrical and/or Fire Inspector may order removal of any material for the purpose of inspecting.

The City of Galena, the Galena Building Department and its inspectors are not liable for the expense entailed in the removal or replacement of any material required for inspection purposes.

No building, or portion of a building, for which a building permit has been issued may be occupied until a final inspection has been performed by the Building Department and approval has been given by the Building Official.

Contractor Registration

In accordance with Section 150.03 of the City of Galena Ordinance: Independent contractors engaged in the business or a combination of businesses such as general construction, carpentry, heating, air conditioning, electrical, fire protection system installation, excavation, or roofing of buildings, structures, or land within the jurisdiction of the city are hereby required to register and provide a certificate of liability insurance.

The liability insurance shall be in the amount of \$500,000.

Roofing contractors must provide proof of current Illinois Stated licensing to complete their registration with the city.

The registration fee shall be \$100 dollars and the period of registration runs from May 1st to April 30th.

Insulation

The International Energy Conservation Code and the Illinois Energy Conservation Code require minimum R-values for all of the different locations of the home. Including, but not limited to: the windows, walls, ceilings, basement walls and floors. Galena is located in climate zone 5.

The required insulation R-values and U-Factors are as follows:

Ceiling R-Value: 49

Floor R-Value: 30

Wood Frame Wall R-Value: 20 or 13+5*

Mass Wall R-Value: 8/13**

Basement Wall R-Value: 10/13**

Fenestration U-Factor: 0.32

Skylight U-Factor: 0.55

*The first value is the cavity insulation, and the second value is the continuous insulation on the exterior of the wall.

**The first number is the continuous insulation on the interior or exterior of the wall, and the second number is the cavity insulation on the interior of the wall.

-The basement wall R-values were amended by the state of Illinois to 10/13 from 15/19.

The amendments that were made by the Illinois Energy Conservation Code will always take precedence to the International Energy Conservation Code.

Foundations

Footings must be placed on undisturbed ground and extend below the frost depth. Exterior footings require excavation of at least 12 inches below the undisturbed soil. Footings may be stepped, but the bottom of a footing shall have a maximum of a 10% slope. Footings shall be no less than 12 inches in width and 6 inches in depth. Footing depth for frost protection in Galena is 42 inches.

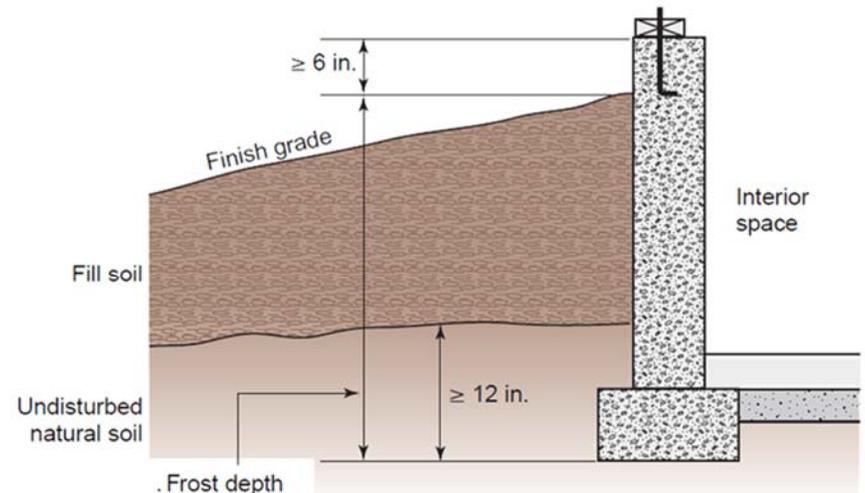


FIGURE 5-3 Depth of exterior footings

The finish grade shall be at least 6 inches below the top of the foundation wall and 4 inches below with a masonry veneer. The final grading shall slope away from the home a minimum of 6 inches in the first 10 feet from the home. Impervious surfaces in the first 10 feet from the home must have a minimum 2% slope away from the home.

Foundations

Wood sill plate anchor bolts shall be placed in the middle 1/3 of the sill plate, and set a minimum of 7 inches into the concrete.

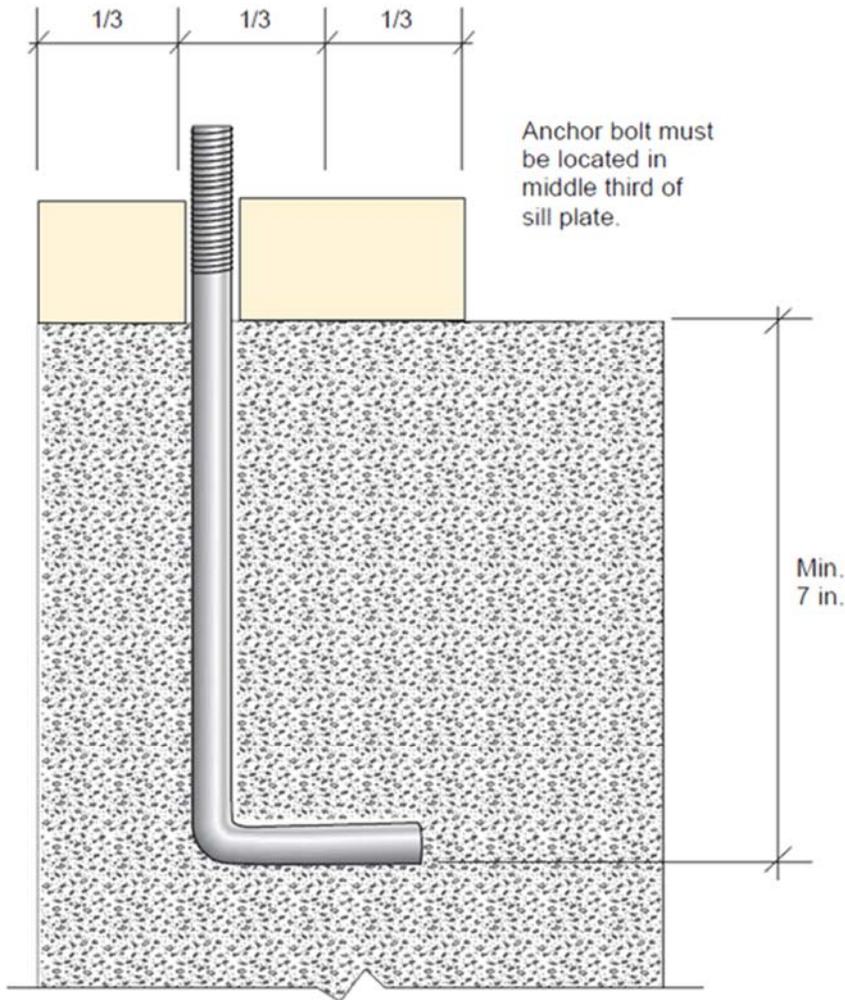


FIGURE 5-13 Anchor bolt placement

Foundations

Wood sill plate anchor bolts shall have a maximum separation of 6 feet. Anchor bolts shall be placed a minimum of 7 bolt diameters and a maximum of 12 inches from the edge of a sill plate. There will also be a minimum of 2 bolts per plate.

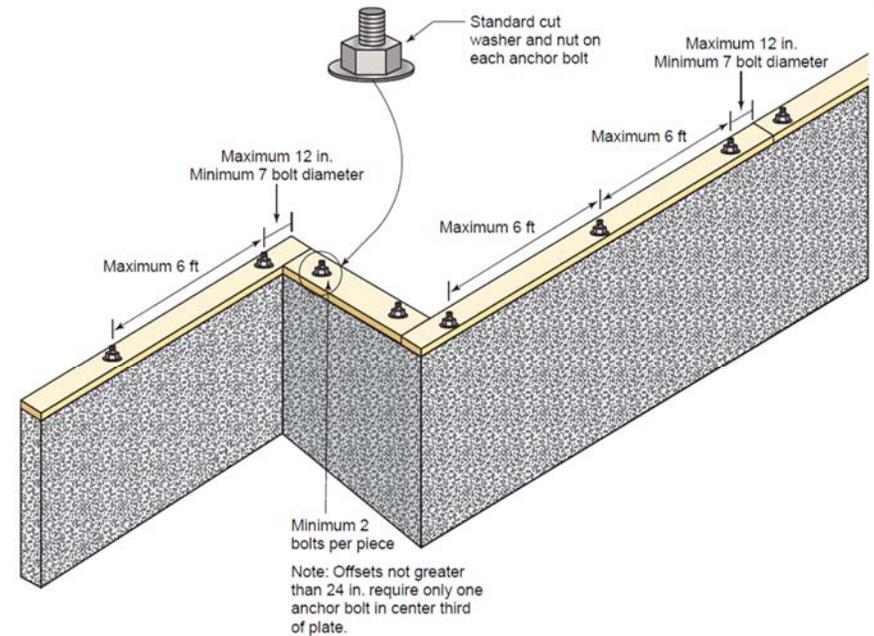


FIGURE 5-14 Wood sill plate anchorage to foundation for all buildings in SDCs A and B, and dwellings in SDC C

*****It is always good practice for the contractor installing the foundation to work together with the framing contractor to determine the proper placement of the wood sill plate anchor bolts.***

For SI: 1 inch = 25.4 mm; 1 foot = 304.8 mm; 1 pound per square foot per foot = 0.1571 kPa²/m. 1 pound per square inch = 6.895 kPa.
 NR = Not required.

- a. Soil classes are in accordance with the Unified Soil Classification System. Refer to Table R405.1.
- b. Table values are based on reinforcing bars with a minimum yield strength of 60,000 psi.
- c. Vertical reinforcement with a yield strength of less than 60,000 psi and/or bars of a different size than specified in the table are permitted in accordance with Section R404.1.3.3.7.6 and Table R404.1.2(9).
- d. NR indicates no vertical wall reinforcement is required, except for 6-inch nominal walls formed with stay-in-place forming systems in which case vertical reinforcement shall be No. 4@48 inches on center.
- e. Allowable deflection criterion is $L/240$, where L is the unsupported height of the basement wall in inches.
- f. Interpolation is not permitted.
- g. Where walls will retain 4 feet or more of unbalanced backfill, they shall be laterally supported at the top and bottom before backfilling.
- h. Vertical reinforcement shall be located to provide a cover of $1\frac{1}{4}$ inches measured from the inside face of the wall. The center of the steel shall not vary from the specified location by more than the greater of 10 percent of the wall thickness or $\frac{3}{8}$ inch.
- i. Concrete cover for reinforcement measured from the inside face of the wall shall be not less than $\frac{3}{4}$ inch. Concrete cover for reinforcement measured from the outside face of the wall shall be not less than $1\frac{1}{2}$ inches for No. 5 bars and smaller, and not less than 2 inches for larger bars.
- j. DR means design is required in accordance with the applicable building code, or where there is no code, in accordance with ACI 318.
- k. Concrete shall have a specified compressive strength, f'_c , of not less than 2,500 psi at 28 days, unless a higher strength is required by Footnote l or m.
- l. The minimum thickness is permitted to be reduced 2 inches, provided the minimum specified compressive strength of concrete, f'_c , is 4,000 psi.
- m. A plain concrete wall with a minimum nominal thickness of 12 inches is permitted, provided minimum specified compressive strength of concrete, f'_c , is 3,500 psi.
- n. See Table R608.3 for tolerance from nominal thickness permitted for flat walls.
- o. The use of this table shall be prohibited for soil classifications not shown.

Table continued from previous page.

Boring and Notching

Any stud shall be permitted to be drilled or notched as long as the limitations depicted in the following figures are met.

If a notch in the top plate of a exterior or interior load bearing wall is greater than 50%, a minimum 16 gauge by 1-1/2 inch galvanized steel plate tie shall be attached to the top plate with at least 8-10d by 1-1/2 inch long nails on each side of the notch. The steel plate shall extend to no less than 6 inches to each side of the notch.

*****Any cuts, notches, or boring in any truss, structural composite lumber, structural glue-laminated member, cross-laminated timber, or I-joist is prohibited except where permitted by the manufacturer's recommendations or by a registered design professional.***

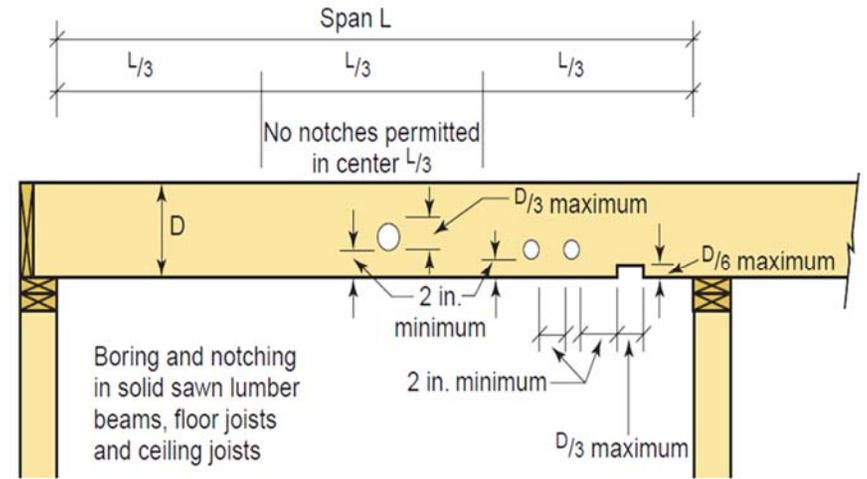


FIGURE 6-9 Boring and notching in solid sawn beams, floor joists and ceiling joists

Fire Blocking/Draftstopping

Fire blocking can often be one of the most overlooked steps in building or remodeling a structure.

The studs at the top of walls will generally provide sufficient fire blocking to satisfy code requirements. Walls with offset studs or other openings will require fire blocking horizontally at 10 foot intervals. Fire blocking is also required at all connections between concealed vertical and horizontal spaces, which is often created by soffits (see fig. 6-13) and pipe chases.

All openings that are created by cables, wires, duct, vents, or pipe chases should also be sealed at the ceiling and floor levels.

Fire blocking materials include any nominal 2 inch lumber, glass fiber insulation, or the equivalent of either.

Where there are large areas of communicating space, such as the space located between a ceiling and the floor above, the IRC requires draftstopping to divide the horizontal spaces into areas of 1000 square feet or less with a 1/2 inch gypsum board or its equivalent.

Draftstopping should divide concealed spaces into approximately equal areas.

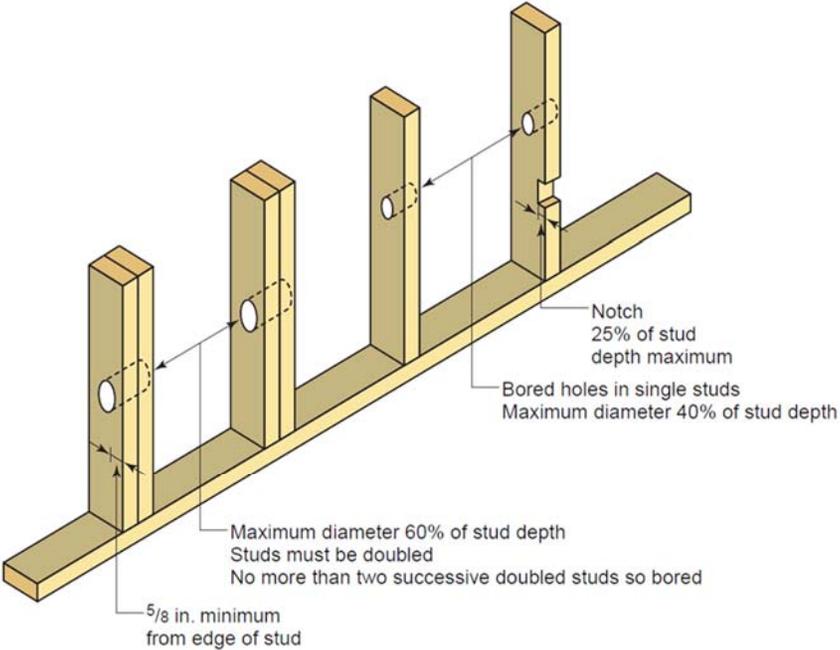


FIGURE 6-10 Boring and notching of studs in exterior wall or bearing interior wall

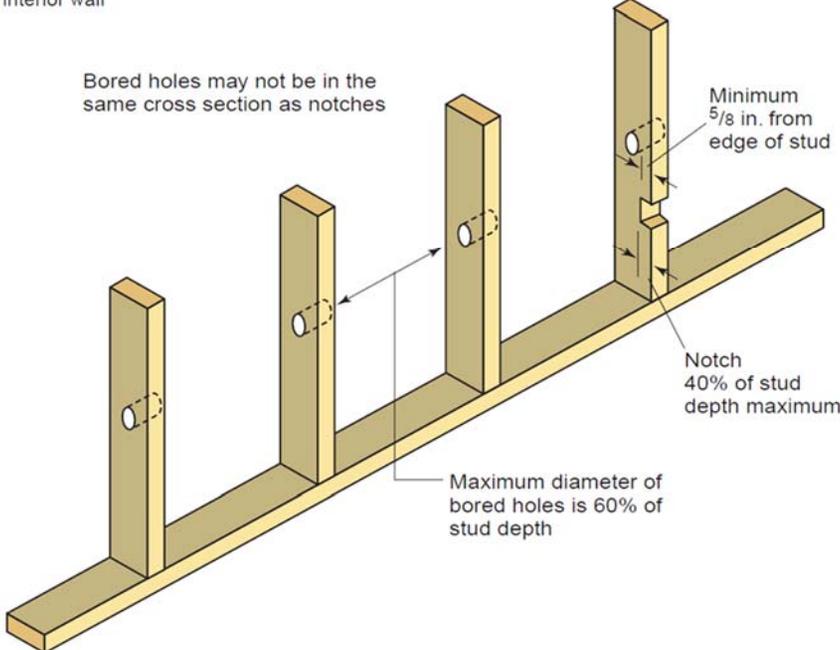


FIGURE 6-11 Boring and notching of studs in nonbearing interior wall

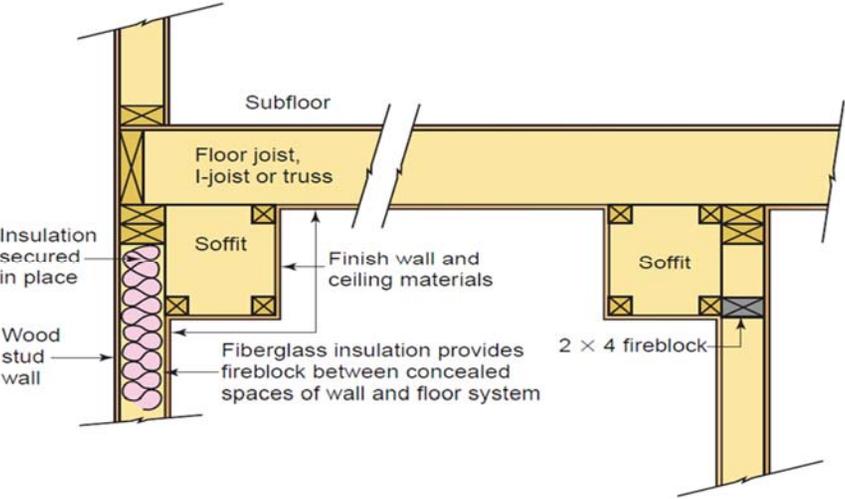


FIGURE 6-13 Fireblocking at soffits

Fire Protection

Floor Assemblies: Floor assemblies shall be provided with a 1/2 inch gypsum wall-board membrane, or the equivalent on the underside of the floor framing. Penetrations for ducts, vents, electrical outlets, lighting, speakers, piping, etc. shall be permitted.

Exceptions:

1. Floors assemblies located directly over a space protected by a sprinkler system
2. Floor spaces located directly over a crawl space not intended for storage or fuel-fired appliances.
3. If the aggregate area of the unprotected area is less than 80 square feet and the area is fire protected from the remainder of the floor assembly.
4. If the floor assembly is constructed of nominal 2x10 inch or greater, or some other approved floor assembly demonstrating equal fire performance.

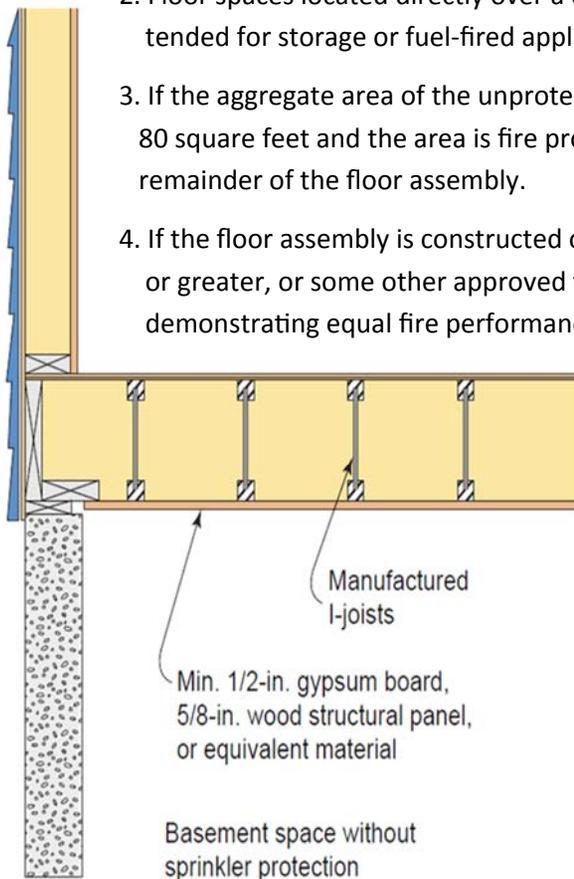


FIGURE 9-19 Fire protection of floors

Fire Protection

Two-Family Dwellings: The separation between units, either through a floor or wall, shall be fire-resistant to not less than 1 hour. Wall assemblies shall be tight to the exterior wall and extend from the foundation to the underside of the roof sheathing.

The following Figures show fire separation between two-family dwellings.

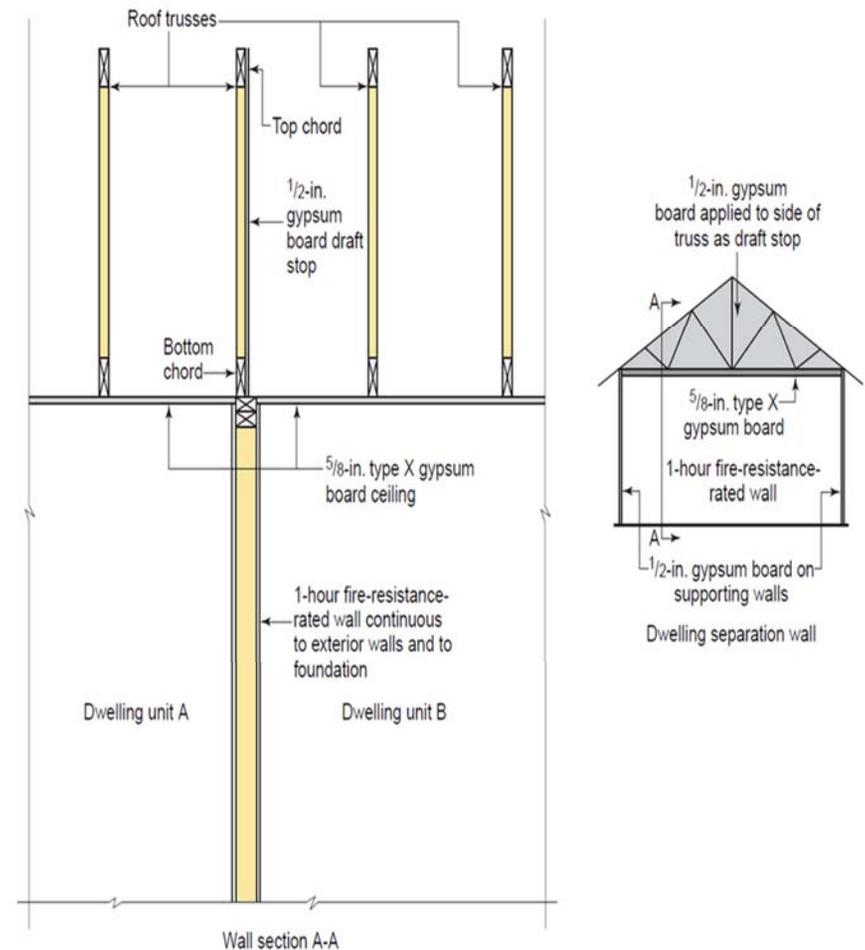


FIGURE 9-9 Alternate attic draft stop for vertical separation of two-family dwelling

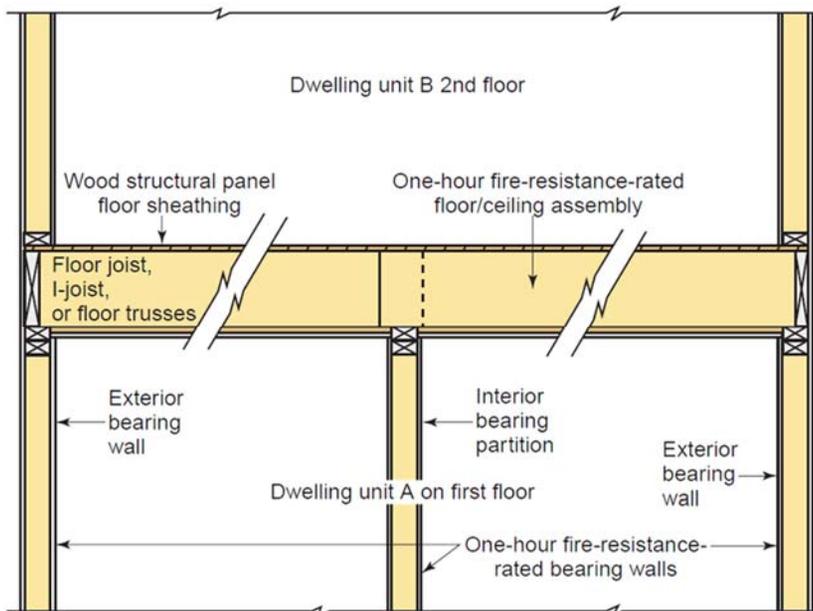


FIGURE 9-7 Horizontal separation for two-family dwelling

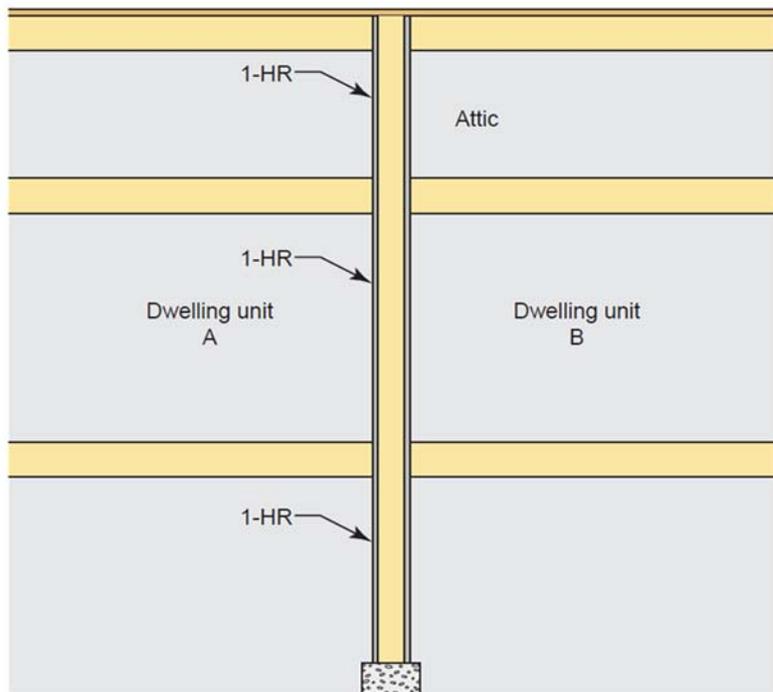


FIGURE 9-8 Two-family dwelling separation wall

Fire Protection

Garage Separation: 1/2 inch gypsum board shall be applied to the garage side wall to separate the dwelling from the garage. 5/8 inch gypsum board shall be applied to the ceiling of the garage to separate the garage from habitable rooms above and the rest of the attic area. Openings, such as doors, from the garage to the dwelling unit shall be equipped with solid wood doors not less than 1-3/8 inch in thickness, a solid or honeycomb core steel door, or a 20 minute fire door. All doors shall

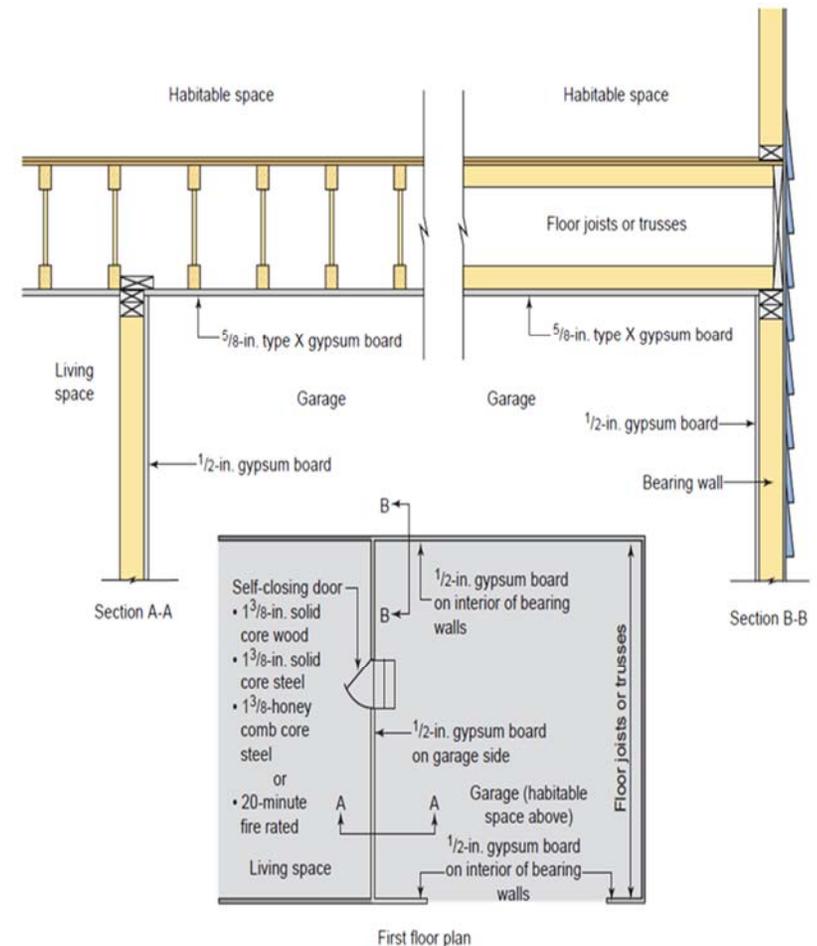


FIGURE 9-18 Separation for attached garage with habitable space above

Smoke Alarms

Smoke alarms are required in each sleeping room, outside of each sleeping room, and on each additional story, including basements and habitable attics. In new construction, the primary power to the smoke alarm system shall be provided by the power from the house and shall have battery backup.

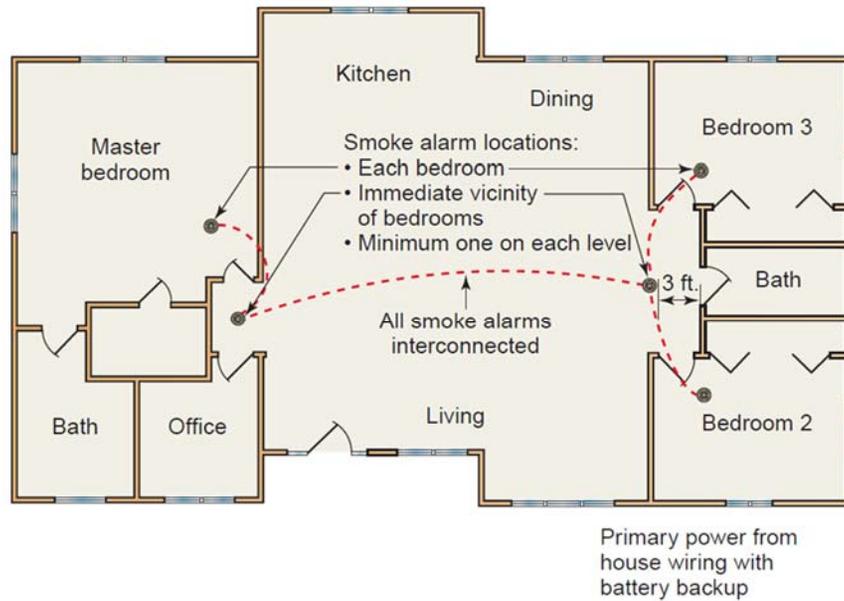


FIGURE 9-2 Smoke alarm locations

Carbon Monoxide Detectors

Carbon monoxide alarms shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms. The CO alarms shall also receive their primary power from the house wiring and have a battery backup.

****Combination CO alarms and Smoke alarms may be used.**

Decks

Attachment of the deck ledger should be made with a minimum 1/2 inch diameter hot-dipped galvanized or stainless steel lag screws or bolts with a washer. Alternative attachments may be made to attach the ledger if the attachment provides equivalent connection capacities, and is approved by the Building Official.

The lag screws or bolts, or other approved fasteners, should be installed in a staggered pattern and should be located no less than 2 inches from the top edge of the ledger and not less than 3/4 inch for the bottom edge of the ledger. The attachment should also be made at a minimum of 2 inches and maximum of 5 inches from the end of the ledger.

All joists framing into the side of the ledger shall require approved joist hangers.

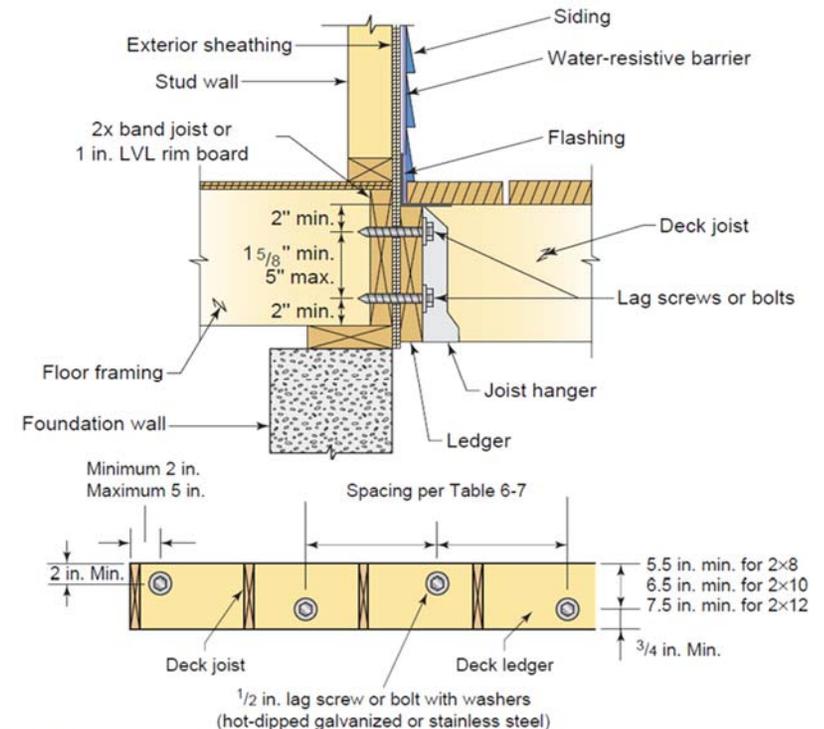


FIGURE 6-20 Deck ledger connection to band joist

Decks

The deck post should be a minimum of a 4x6 or a 6x6 inch to provide the minimum cross section of 5-1/2 inches for notching and attachment to the deck beam.

Deck posts should be attached to the deck beam by either notching the post with two through bolts or using an approved manufactured post cap.

The bolts used to attach the beam to the post should be a minimum of a 1/2 inch diameter hot-dipped galvanized or stainless steel lag screw or bolt with washers. Alternative attachments may be made to attach the beam to the post, if the attachment provides equivalent connection capacities, and is approved by the Building Official.

The deck posts should be attached to either a footing or concrete pier using a manufactured connector or any other approved method.

****Deck guards shall be no less than 36 inches in height and are required if the fall from the walking surface is more than 30 inches measured to the lowest point within 36 inches of the edge of the deck.**

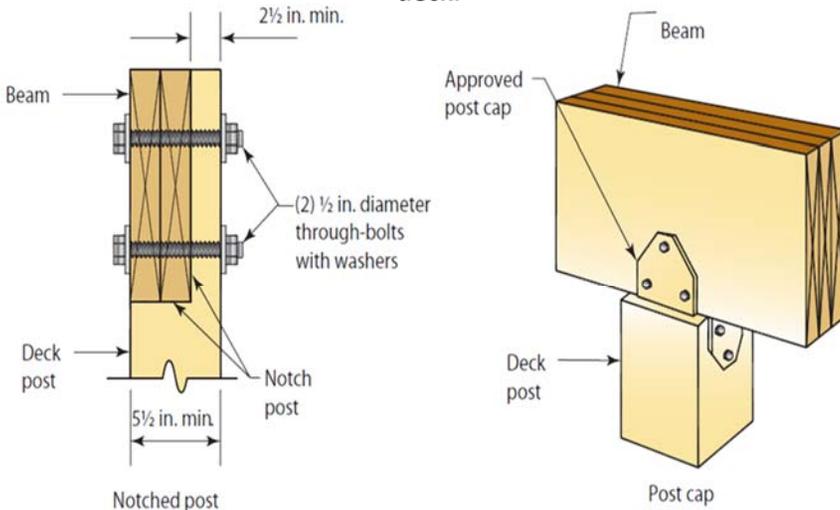


FIGURE 6-19 Connection of deck posts to deck beam

Decks

The following tables show allowable deck joist and deck beam spans.

**TABLE R507.5
DECK JOIST SPANS FOR COMMON LUMBER SPECIES¹ (ft. - in.)**

SPECIES ¹	SIZE	SPACING OF DECK JOISTS WITH NO CANTILEVER ¹ (inches)			SPACING OF DECK JOISTS WITH CANTILEVERS ² (inches)		
		12	16	24	12	16	24
Southern pine	2 x 6	9-11	9-0	7-7	6-8	6-8	6-8
	2 x 8	13-1	11-10	9-8	10-1	10-1	9-8
	2 x 10	16-2	14-0	11-5	14-6	14-0	11-5
	2 x 12	18-0	16-6	13-6	18-0	16-6	13-6
Douglas fir-larch, ⁴ hem-fir ⁴ spruce-pine-fir ⁴	2 x 6	9-6	8-8	7-2	6-3	6-3	6-3
	2 x 8	12-6	11-1	9-1	9-5	9-5	9-1
	2 x 10	15-8	13-7	11-1	13-7	13-7	11-1
	2 x 12	18-0	15-9	12-10	18-0	15-9	12-10
Redwood, western cedars, ponderosa pine ⁵ , red pine ⁶	2 x 6	8-10	8-0	7-0	5-7	5-7	5-7
	2 x 8	11-8	10-7	8-8	8-6	8-6	8-6
	2 x 10	14-11	13-0	10-7	12-3	12-3	10-7
	2 x 12	17-5	15-1	12-4	16-5	15-1	12-4

For SF: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

a. No. 2 grade with wet service factor.

b. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360.

c. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220-pound point load applied to end.

d. Includes incising factor.

e. Northern species with no incising factor.

f. Cantilevered spans not exceeding the nominal depth of the joist are permitted.

Decks

TABLE R507.6
DECK BEAM SPAN LENGTHS^{a, b} (ft. - in.)

SPECIES ^c	SIZE ^d	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)							
		6	8	10	12	14	16	18	
Southern pine	2-2 x 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0	
	2-2 x 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0	
	2-2 x 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0	
	2-2 x 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0	
	3-2 x 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0	
	3-2 x 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4	
	3-2 x 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6	
	3-2 x 12	15-3	13-3	11-10	10-9	10-0	9-4	8-10	
Douglas fir-larch ^e , hem-fir ^e , spruce-pine-fir ^e , redwood, western cedars, ponderosa pine ^f , red pine ^f	3 x 6 or 2-2 x 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9	
	3 x 8 or 2-2 x 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8	
	3 x 10 or 2-2 x 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8	
	3 x 12 or 2-2 x 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7	
	4 x 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8	
	4 x 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10	
	4 x 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8	
	4 x 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7	
	3-2 x 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6	
	3-2 x 8	9-8	8-6	7-7	6-11	6-5	6-0	5-8	
	3-2 x 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11	
		3-2 x 12	13-11	12-1	10-9	9-10	9-1	8-6	8-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.
 a. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220-pound point load applied at the end.
 b. Beams supporting deck joists from one side only.
 c. No. 2 grade, wet service factor.
 d. Beam depth shall be greater than or equal to depth of joists with a flush beam condition.
 e. Includes incising factor.
 f. Northern species. Incising factor not included.

Flashing

To prevent water from entering and penetrating the wall assembly, corrosion-resistant flashing shall be installed at specific locations. Locations include, but are not limited to, window and door openings, penetrations, projections, wall and roof intersections, and intersections of dissimilar materials.

Flashing is particularly important at the connection of a deck, around windows and doors, and on the roof.

****The Figures show proper flashing techniques.**

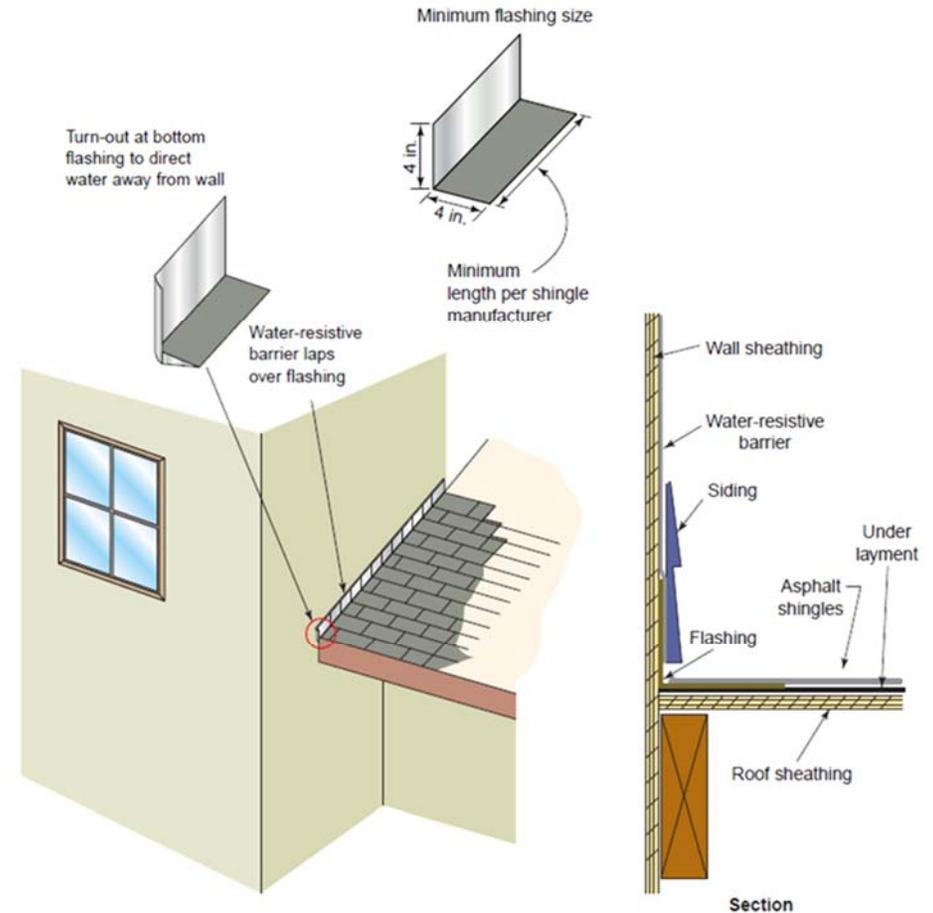


FIGURE 7-12 Sidewall flashing for asphalt shingles

Flashing

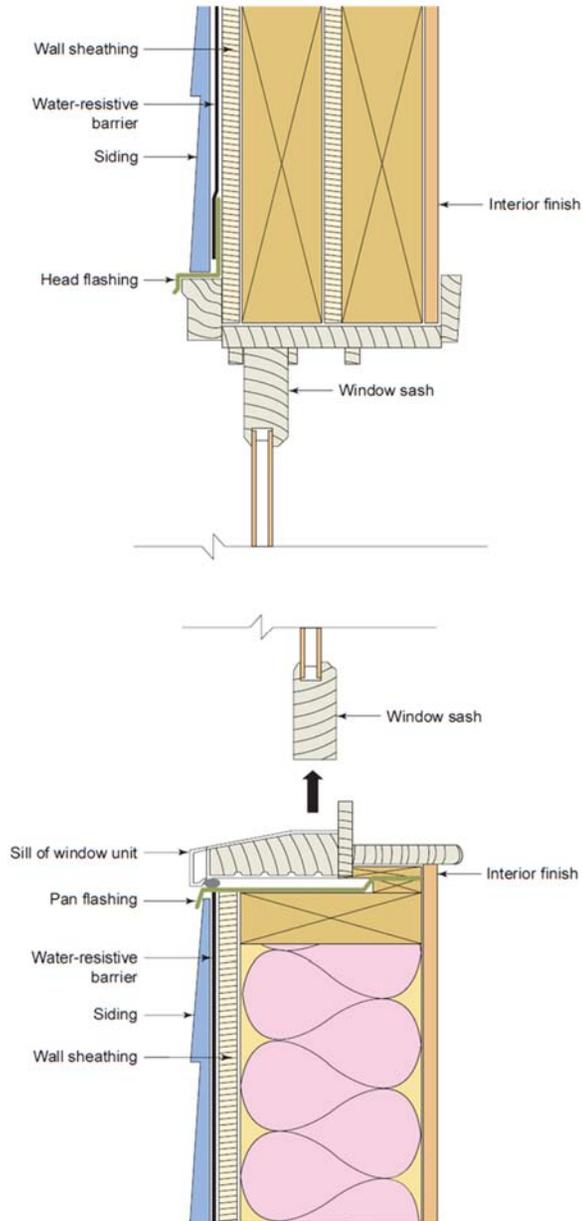


FIGURE 7-8 Window flashing

Flashing

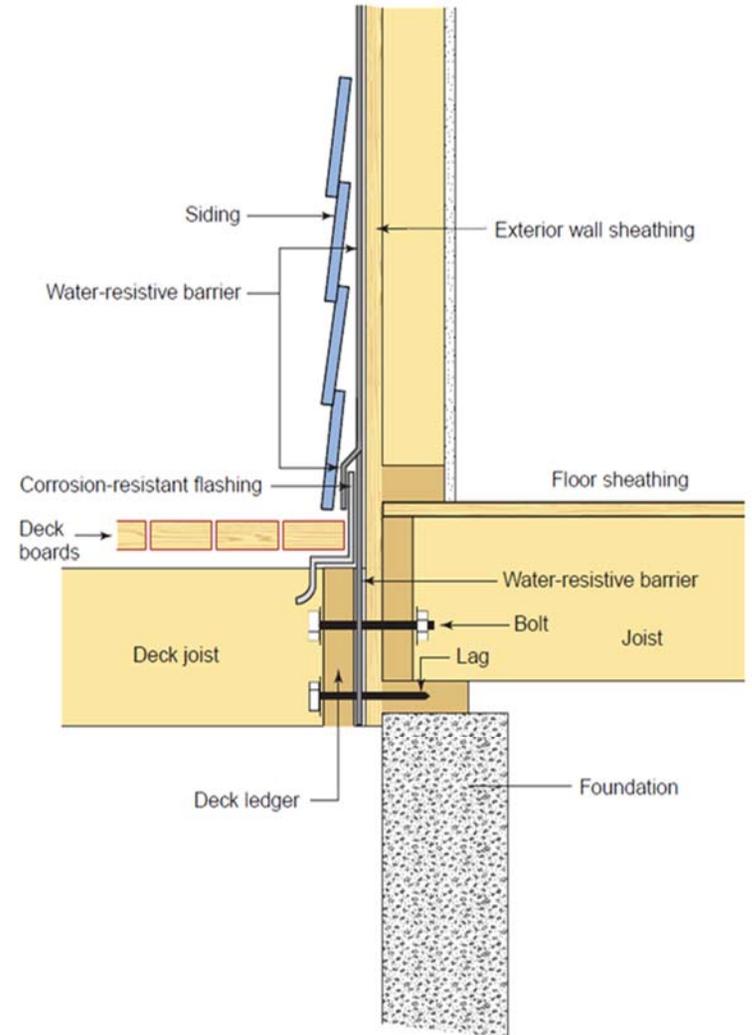


FIGURE 7-1 Wall flashing at deck

Ceiling Height

Adequate ceiling heights for a habitable spaces are important because proper height contributes to a healthy living space and provides the ability to safely move around and exit a home. While the code allows for sloped ceilings, the general rule is to allow a minimum of 7 feet of ceiling height in a habitable space, including basements.

Reductions in the ceiling height are allowed in bathrooms, laundry rooms, rooms with sloped ceilings, and below soffits and beams.

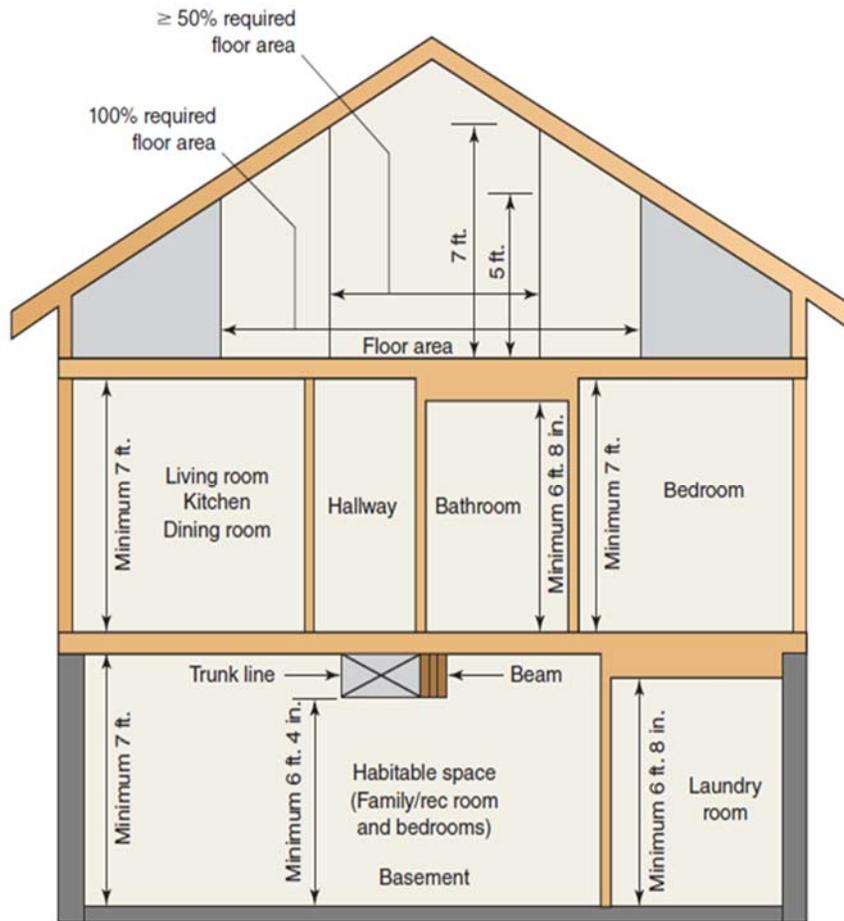


FIGURE 8-2 Ceiling height

Means of Egress

Means of Egress describes the path of travel from any location of the house to the exterior. Code regulates stairways, ramps, hallways, doors and any other primary component of path of safe travel to the exterior of the home. All hallways defined as a means of egress must be a minimum of 3 feet wide.

Doors and Landings: For any dwelling unit, the code requires at least one side hinged exterior door with a minimum nominal opening of 32 inches by 78 inches. This is generally achieved with a 3 foot exterior door. The maximum threshold of the exterior egress door should have

a maximum 1-1/2 inch threshold and is must have a landing at the exterior of the door and at more than 7-3/4 inches below the top of the threshold.

Figure 8-2 the requirements for an exterior egress door.

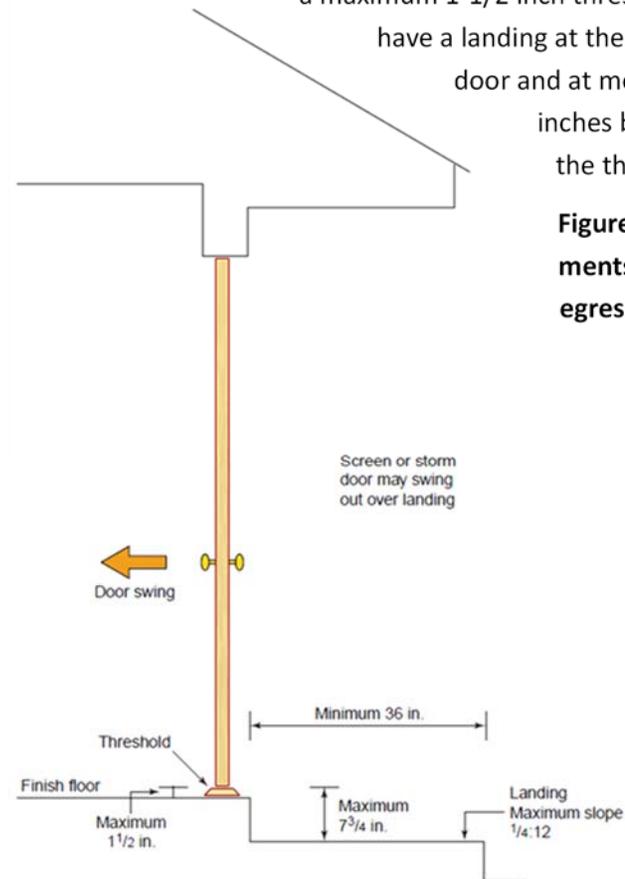


FIGURE 8-3 Landing at required exterior exit door

Means of Egress

Stairway Headroom and Handrail Height: The headroom in a staircase shall be a minimum of 6 foot 8 inches in height.

The handrails should extend to a point above the top and bottom riser and return into the wall. The handrail should also be a minimum of 34 to 38 inches in height. A circular handrail must have a cross section of 1-1/4 to 2 inches. Handrails of any other shape are permitted as long as they provide equivalent graspability as approved by the Building Official. Handrails must be securely fastened and able to withstand a load of 200 pounds applied in any direction.

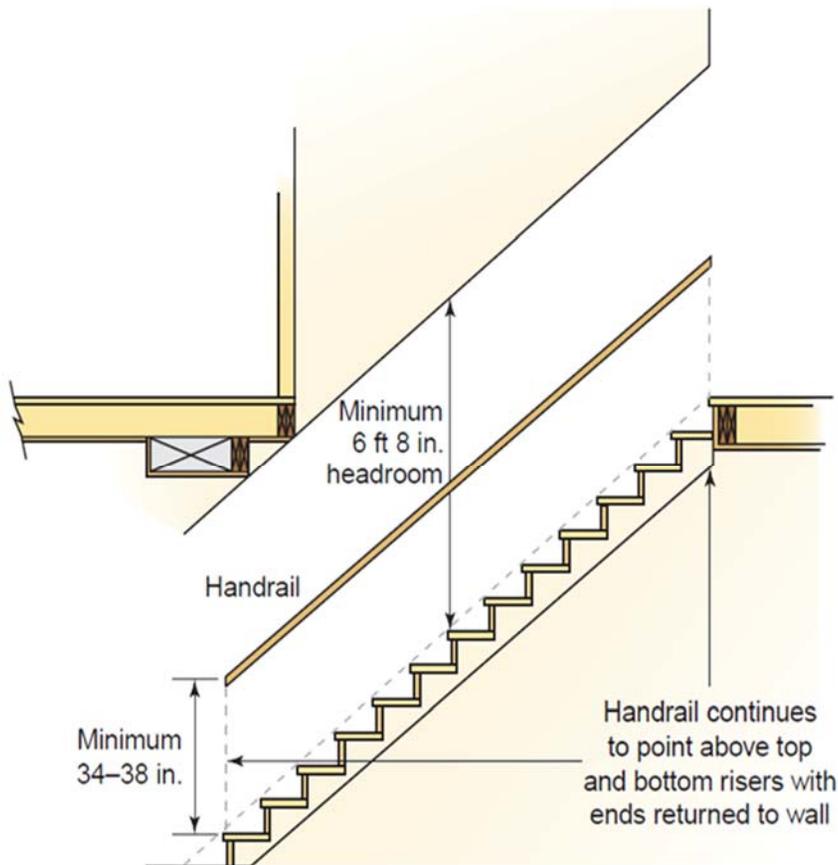


FIGURE 8-6 Stairway headroom and handrail height

Means of Egress

Handrails and Guards: Guards shall be no less than 36 inches in height and are required if the fall from the walking surface is more than 30 inches measured to the lowest point within 36 inches of the edge of the walking surface. The minimum height of a guard on the side of a staircase open to the floor below shall be a minimum of 34 inches in height.

Guards shall not allow the passage of greater than a 4 inch sphere through the balusters.

Exceptions:

1. The opening created by the tread, riser, and bottom rail of the guard shall not allow the passage of greater than a 6 inch sphere.
2. The space between balusters on the side of a staircase may not allow a sphere of not greater than 4 3/8 inches.

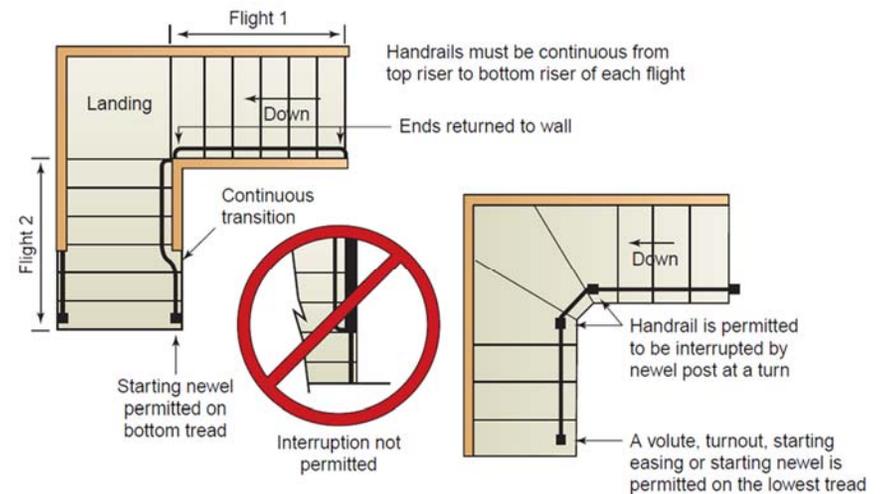


FIGURE 8-12 Handrail continuity

Handrails must be a continuous run with no interruptions on a single flight of stairs.

See Fig. 8-12 above for proper installation of handrails.

Means of Egress

Stair Profiles: Stairway treads shall be a minimum of 10 inches and the stairway risers shall be a maximum of 7-3/4 inches. It is important for the treads and risers to stay uniform and should have very little variation throughout the length of the stairs.

If there is a space in the riser on a staircase with a height of greater than 30 inches, it shall be only large enough to not allow a 4 inch sphere to pass through. If staircase is less than 30 inches in height, risers are not necessary.

When a nosing projection is not installed on the end of a tread, the tread length shall be 11 inches.

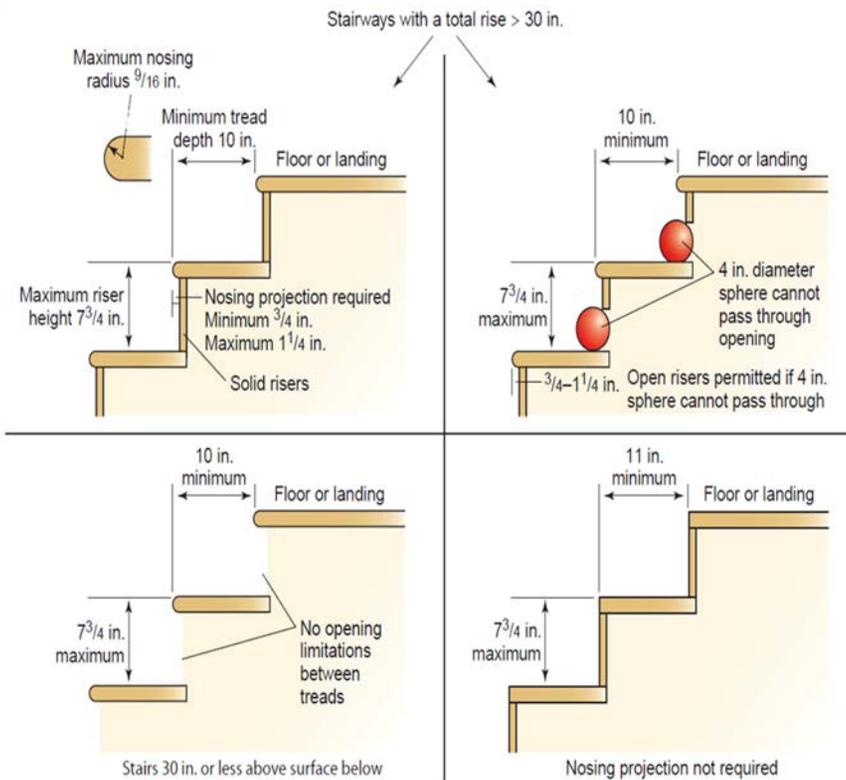


FIGURE 8-8 Stair profiles

Means of Egress

Winding Stairs: Any time that the treads of a staircase do not have parallel edges, the staircase is considered to be a winding staircase. The narrow end of the tread permitted be a minimum of 6 inches in depth as long as the tread has a minimum depth of 10 inches within 12 inches of the narrow side. This configuration can allow a staircase to be built without a landing.

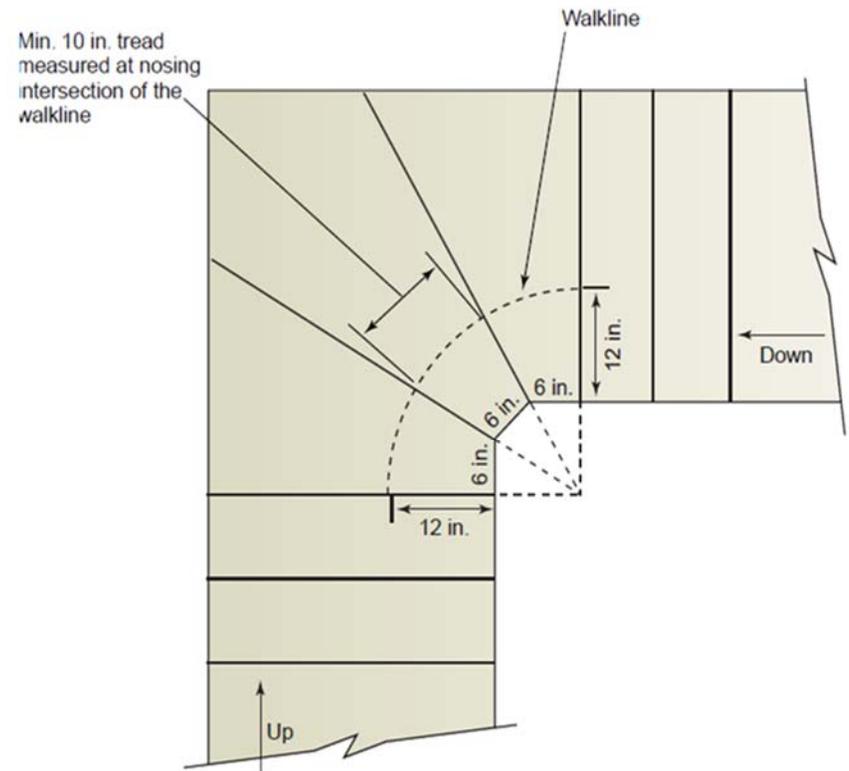


FIGURE 8-9 Winders are permitted in the same flight of stairs as rectangular treads.

Means of Egress

Spiral Stairs: Even though a spiral staircase is allowed to have a lesser head height and tread size, as well as a higher riser height, they are permitted to serve as a means of egress from any story.

A spiral staircase shall have all identical treads and a minimum headroom of 6 feet 6 inches. The treads must be a minimum of 2 feet 6 inches in length with a minimum tread depth of 6-3/4 inches within 12 inches of the narrow side. The risers are permitted to be a maximum of 9-1/2 inches in height.

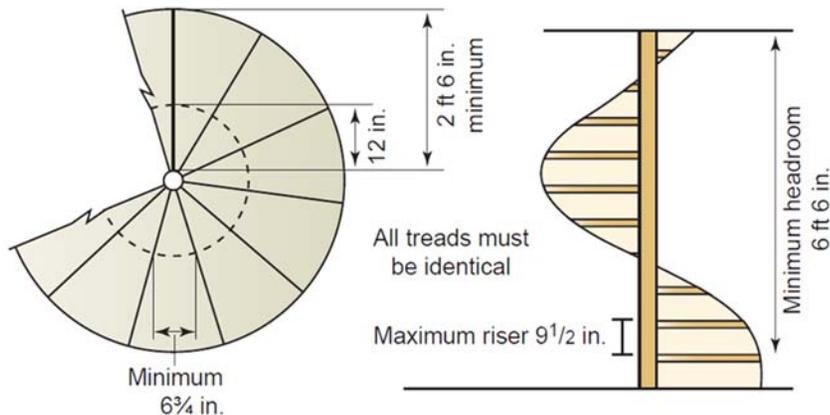


FIGURE 8-10 Spiral stair

Stair Landings: The general rule of landings is that a landing is required at the top and bottom of a staircase. An exception to the landing rule is that a door is allowed at the top of an interior stairway, as long as the door does not swing over the stairs.

Electrical

Equipment Location: The electrical equipment should typically be mounted to an interior wall near to where the service conductors enter the building. The working space around the equipment shall be a minimum of 30 inches wide and 36 inches deep with a minimum headroom of 6 foot 6 inches. The working space around the electrical equipment shall also have a light source nearby.

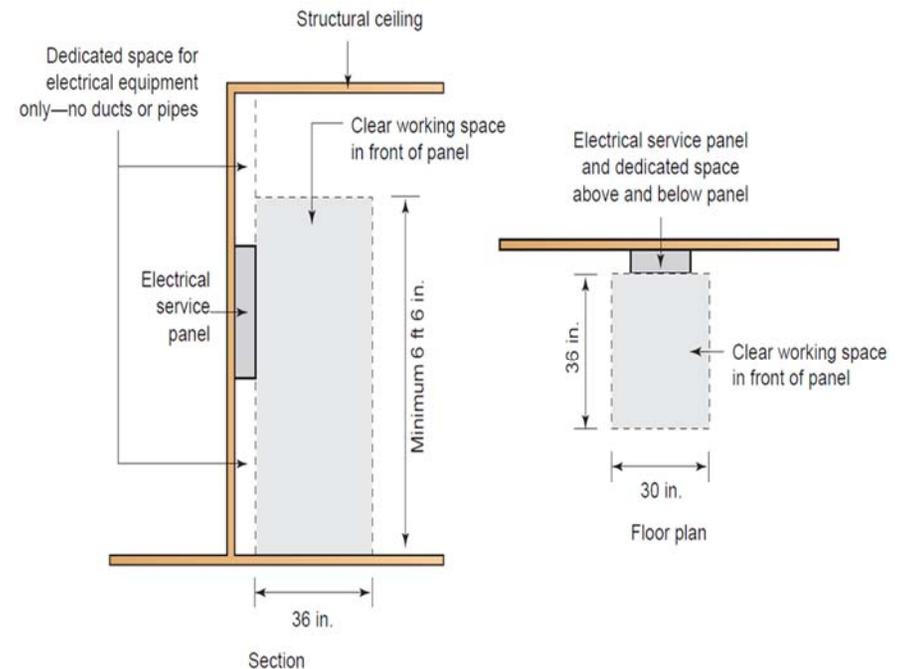


FIGURE 14-1 Electrical panel location and clearance

The service disconnect must be in a readily accessible area that can be accessed without the use of tools or a ladder. The spaces that are directly above and below the panel are dedicated areas for electrical installation and are not permitted to have pipes and ducts located in that area. The code does not permit the installation of electrical panels or service disconnects in closets or bathrooms.

Electrical

Grounding and Bonding: The most commonly used grounding electrodes include underground metal water pipes, concrete encased reinforced bar (*Ufer* ground), and approved ground rods. *Ufer* grounds are now required on all new construction.

While the code does not permit the interior water system to be used as a ground or a grounding electrode, the metal water piping should be properly bonded.

See Figure 14-2 below for proper grounding methods.

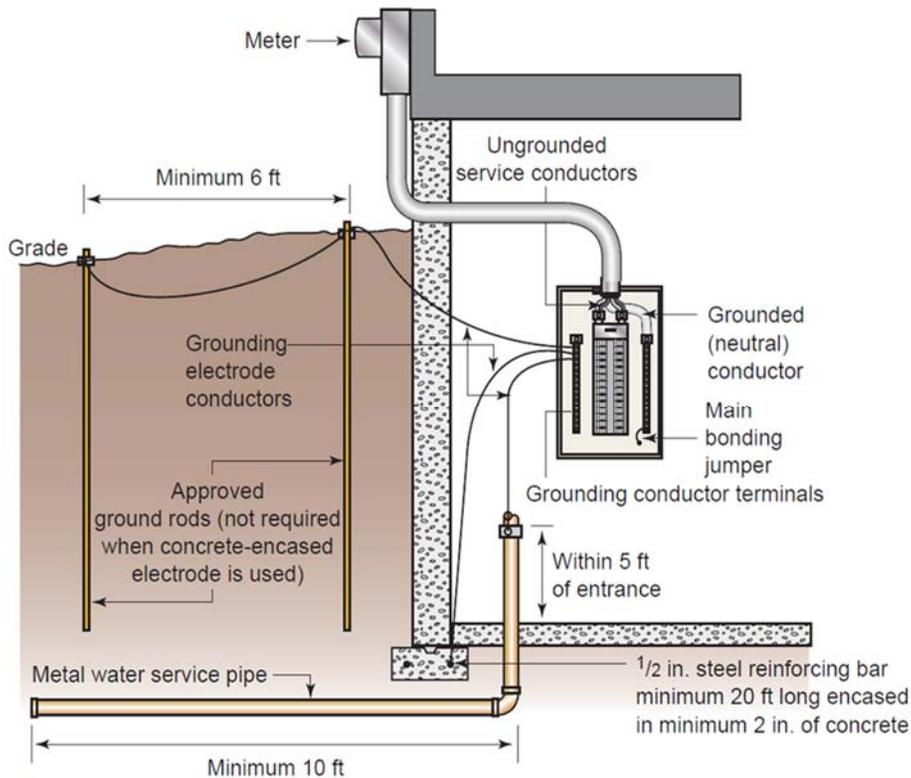


FIGURE 14-2 Grounding electrode system

Electrical

Proper NM cable installation: The most common type of wiring used in residential homes is NM (non-metallic) cable. NM cable is not permitted to be underground, in wet locations, or embedded in concrete. The main installation concerns associated with NM cable is physical damage. Therefore, there are minimum requirements for the installation of NM cable.

See Figure 14-5 on the following page to see the proper installation of NM cable.

GFCI Protection

The following locations shall be protected by ground-fault circuit interruption.

- | | |
|-------------------------|------------------------------|
| 1. Bathrooms | 6. Kitchens |
| 2. Garages | 7. Sinks |
| 3. Outdoors | 8. Boathouses |
| 4. Crawlspace | 9. Bathtub and Shower Stalls |
| 5. Unfinished Basements | 10. Laundry Areas |

AFCI Protection

The following locations are required to be arc-fault protected when they are not required to otherwise to be GFCI protected.

- | | | |
|-----------------|---------------|-------------------|
| 1. Kitchens | 6. Libraries | 11. Closets |
| 2. Family Rooms | 7. Dens | 12. Hallways |
| 3. Dining Rooms | 8. Bedrooms | 13. Laundry areas |
| 4. Living Rooms | 9. Sunrooms | |
| 5. Parlors | 10. Rec rooms | |

Electrical

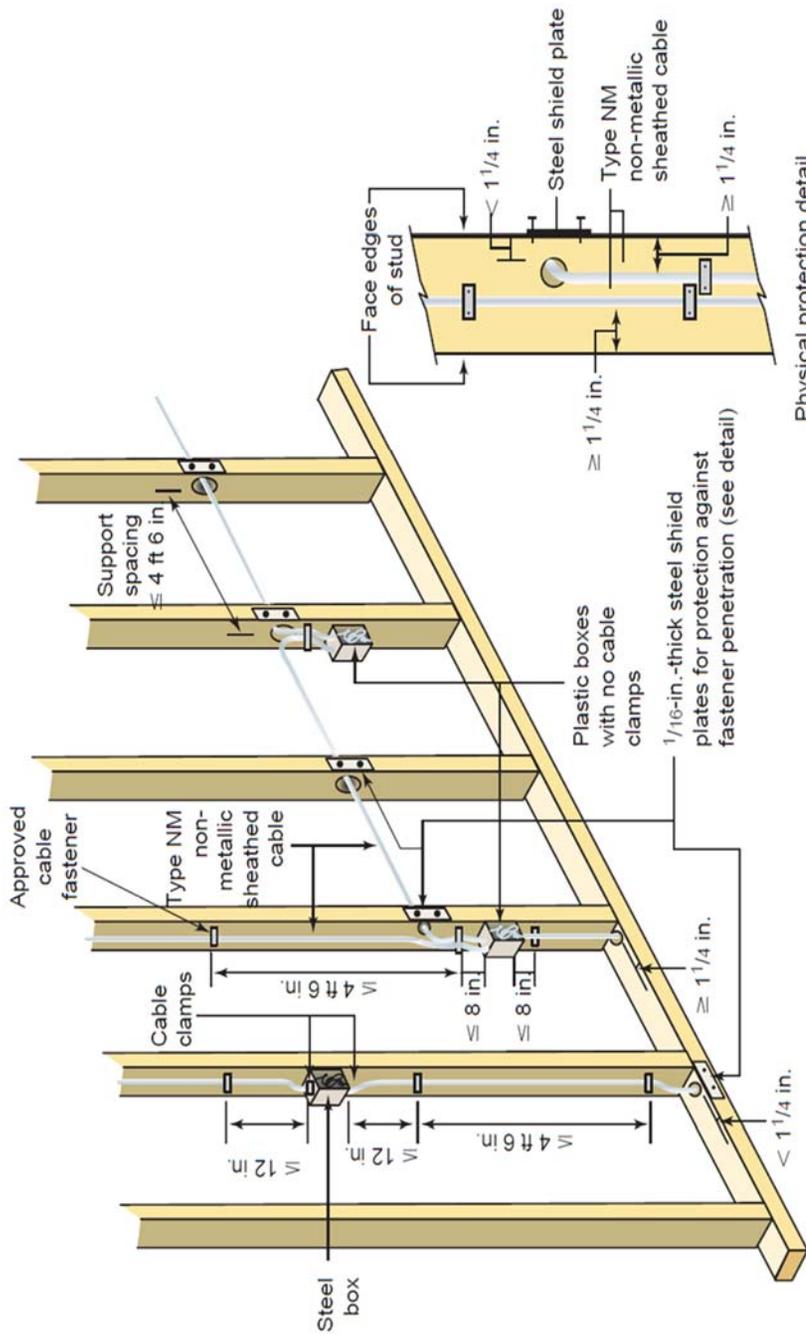


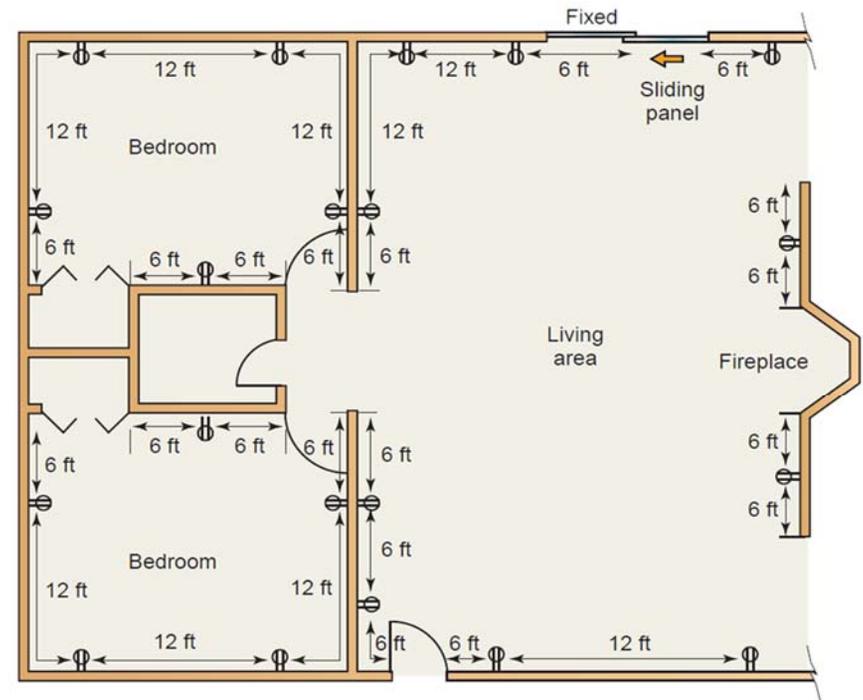
FIGURE 14-5 Type NM cable installation

Electrical

Receptacles: Receptacles that are installed on an individual branch circuit must have an ampere rating of not less than that of the branch circuit. When the receptacle is installed in a wet location, the receptacle requires a weatherproof enclosure that can remain closed even when a cord is plugged into it.

The code requires tamper resistant receptacles to be installed in all locations that are accessible to children within a dwelling unit and on the outside of the dwelling unit. This also includes attached and detached garages.

Reference Figure 14-8 below for proper locations of dwelling unit receptacles.



Dimensions shown are maximum spacing of general purpose receptacles

FIGURE 14-8 Habitable room receptacle outlet locations

Electrical

There must be a minimum of two 20 amp outlets in a kitchen.

Reference Figure 14-9 below for proper kitchen outlet locations.

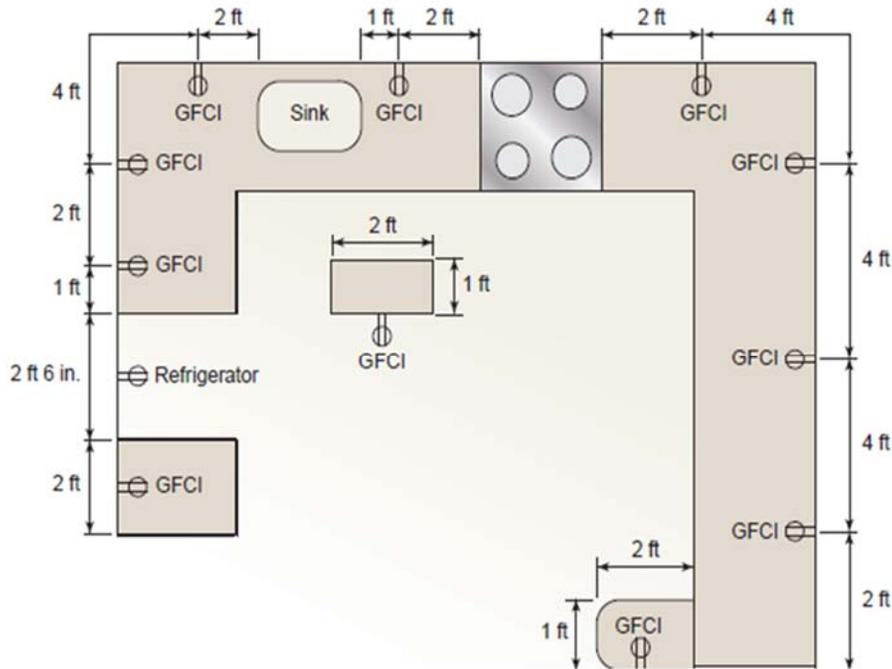


FIGURE 14-9 Kitchen counter receptacle outlets

Lighting: Wall switch controlled lighting is required in all habitable rooms, bathrooms, hallways, storage areas, garages, at each stairway, and outside of each exterior door.

All lighting that is located in habitable areas, as well as garages, closets, storage rooms, and utility rooms shall have a protective globe over the light source. Exposed light bulbs are not permitted.

Recessed lighting must maintain a minimum clearance to any combustible and thermal insulation. Lighting in closets must also be installed at a safe clearance to any combustible.

Radon Resistant Construction Act

Effective June 1, 2013 all new construction of single-family homes or dwellings containing 2 or fewer apartments, condominiums, or town houses must have a passive radon pipe installed. The installation of this radon resistant construction may be performed by a residential building contractor or his or her subcontractors or a radon contractor during new residential construction. Only a radon mitigation contractor licensed by the Illinois Emergency Management Agency may install a radon vent fan or upgrade this passive new construction pipe to an active mitigation system.

ICC Code Resources

**A great place to find all of the International Code Council code is at codes.iccsafe.org. If you choose the I-codes tab at the bottom, this is a link to all of the digital codes that ICC offers.

**To find any approved alternate methods to code requirements, you can check out www.icc-es.org.



Sources:

Figures 5-3, 5-13, 5-14, 5-22, 6-9, 6-11, 6-13, 6-19, 6-20, 7-1, 7-8, 7-12, 8-2, 8-3, 8-6, 8-8, 8-9, 8-10, 8-12, 9-2, 9-7, 9-8, 9-9, 9-18, 9-19, 14-1, 14-2, 14-5, 14-8 and 14-9. Excerpted from the 2015 Residential Code Essentials; Copyright 2015.

Tables R404.2.1 (8), R507.5 and 507.6. Excerpted from the 2015 International Residential Code; Copyright 2014.

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