DIFFERENCES BETWEEN BUILDING AND RESIDENTIAL CODES

The 2010 California Residential Code regulates one- and two-family homes and townhouses that are three stories or less above grade plane. The 2010 California Building Code regulates all other buildings. (See handout titled 2010 California Building and Residential Code Requirements for wildland fire exposure and fire sprinkler requirements.) Projects submitted for building plan check after December 31, 2010 will be required to comply with the 2010 codes.

There are significant differences between the requirements in the Building Code and the Residential Code. Some of the requirements in the Residential Code that differ from those in the Building Code are:

Structural Design:
Residential Code: Allows buildings to be designed by nonlicensed persons as long the prescriptive methods in the Code are followed. If certain portions of the building do not comply with the prescriptive methods, only those portions need to be designed by a licensed professional. The design criteria in Table R301.2(1) are shown in the City's adopting ordinance of the State Codes.
Building Code: Does not have prescriptive methods for structural design.

Floor Level at Exterior Doors:
Residential Code: At required egress door, the exterior landing or floor shall not be more than 7.75" below the top of the threshold provided the door does not swing over the landing or floor. At other than required egress door, the exterior floor or landing may be 7.75" below the threshold even if the door swings over the landing and if the door does not swing outward, a stairway of two or fewer risers may be located on the exterior side of the door. Storm and screen doors are permitted to swing over all exterior stairs and landings.
Building Code: For R-3 (single family) occupancies, the landing at an exterior door shall not be more than 7.75" below the threshold provided the door does not swing over the landing. For R-2 (multiple family) and R-3 occupancies, the exterior landing can be no more than 7" below the threshold if the door swings outward.

Stair handrails:
Residential Code: Required on one side of stairs only.
Building Code: Required on both sides of stairs except inside dwelling units where only required on one side.

Exterior stairs:
Residential Code: Does not address fire protection or location of exterior stairs. City will allow exterior stairs without protection (other than required by Section R327) if the stairs are at least five feet from the property line since this is point at which unlimited openings without protection are allowed for exterior walls for an unsprinklered building.
Building Code: Exterior stairs not allowed within ten feet of property line unless building wall adjacent to stairs is fire protected with protected openings.

CALIFORNIA RESIDENTIAL CODE REQUIREMENTS

The 2010 California Residential Code contains some provisions that are "new" to code users that were familiar with the provisions in the California Building Code. Some of those provisions are listed below:

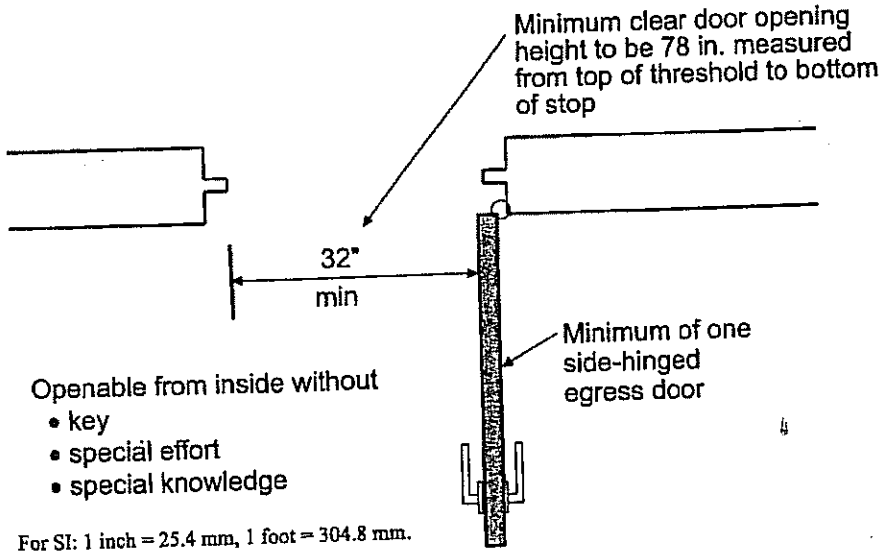
1. Walls separating garages from dwelling units can be ½" gypsum board.
2. Required natural light into habitable rooms is 8% of floor area, natural ventilation is 4% of floor area.
3. Required ceiling height in habitable rooms is 7 feet (including hallways, bathrooms, laundry rooms, habitable basements). Basements without habitable may have a ceiling height of 6'8".
4. Every dwelling unit must have an egress door that is side hinged with a minimum clear opening width of 32" and height of 78". If this door is not at grade level, a complying stairway or ramp must be installed to grade level. For floor levels located more than one level above or one level below grade level, the maximum travel distance from any occupied point to an egress stairway or ramp shall not exceed 50 feet.
5. Handrails for ramps and stairs must comply with CRC 311.7.3.3 as Type I or Type II handrails. (See attached sheets.)
6. Guards (Guardrails) must be 42" high except at stairs where they can be 34" to 38" high. Openings in the intermediate rails at stairs can be 4 3/8" (4" at other locations).
7. Carbon monoxide alarms are required in addition to smoke alarms. Only required where gas burning appliances are installed or there is an attached garage.
8. Fasteners and connectors for preservatively treated wood and fire retardant treated wood must be protected per R317.3.

Topic: Egress Door
Reference: IRC R311.2

Category: Building Planning
Subject: Means of Egress

Code Text: *At least one egress door shall be provided for each dwelling unit. The egress door shall be side-hinged, and shall provide a minimum clear width of 32 inches (813 mm) when measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). The minimum clear height of the door opening shall not be less than 78 inches (1981 mm) measured from the top of the threshold to the bottom of the stop. Other doors shall not be required to comply with these minimum dimensions. Egress doors shall be readily openable from inside the dwelling unit without the use of a key or special knowledge or effort.*

Discussion and Commentary: Regardless of the size of the dwelling unit, only one exterior egress door is required. Not only must the designated egress door be side-hinged, the door opening must provide 32 inches in clear width and 78 inches in clear height. The other doors within the dwelling unit can be of any size and need not be of the swinging type.

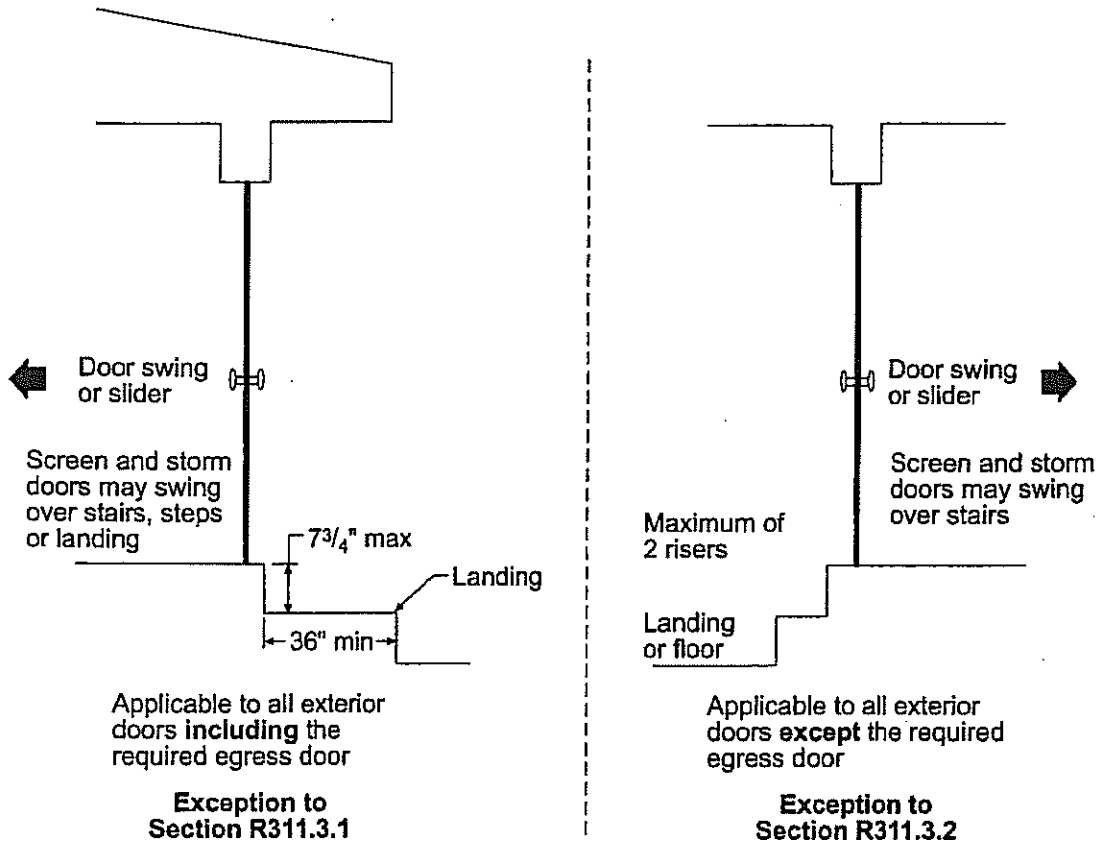


The designated egress door must be provided with latching and/or locking hardware that is under the control of and operable by any occupant seeking egress. The performance language of the code permits a variety of hardware options, provided they meet the intent of the provisions.

Topic: Landings at Doors | **Category:** Building Planning
Reference: IRC R311.3 | **Subject:** Means of Egress

Code Text: *There shall be a floor or landing on each side of each exterior door. Landings or floors at the required egress door shall not be more than 1 1/2 inches (38 mm) lower than the top of the threshold.* See exceptions for exterior landings at all exterior doorways where the door does not swing over the landing, and 3) the height of floors at exterior doors other than the required exit door.

Discussion and Commentary: As a general rule, a maximum elevation change of 1 1/2 inches is permitted at the exterior side of exterior doors, measured from the top of the threshold to the landing. A commonly utilized exception permits up to a 7 3/4-inch height difference, provided the exterior door, other than a screen or storm door, does not swing outward over the exterior landing. The user's typical familiarity with the change in elevation at the dwelling's exterior doors justifies such an allowance.



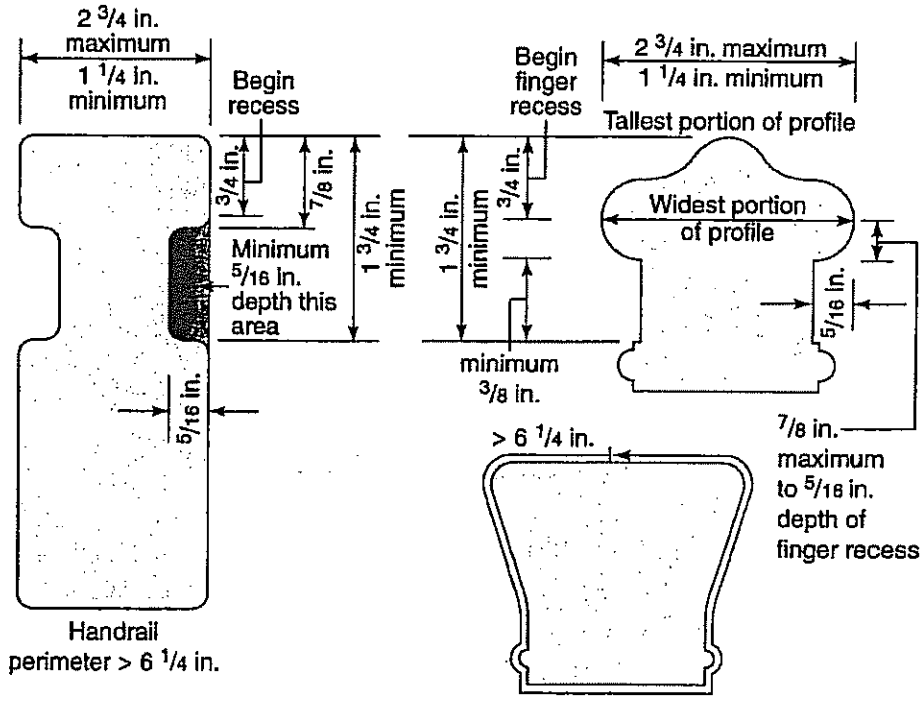
For SI: 1 inch = 25.4 mm

At other than the required exit door, it is also acceptable to raise an exterior door threshold up to 7 3/4 inches above the floor on the interior side.

Topic: Type II Handrails | **Category:** Building Planning
Reference: IRC R311.7.7.3, #2 | **Subject:** Means of Egress

Code Text: *Type II. Handrails with a perimeter greater than 6 1/4 inches (160 mm) shall have a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of 3/4 inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16 inch (8 mm) within 7/8 inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least 3/8 inch (10 mm) to a level that is not less than 1 3/4 inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 1/4 inches (32 mm) to a maximum of 2 3/4 inches (70 mm).*

Discussion and Commentary: The key features of the graspability of Type II handrails are graspable finger recesses on both sides of the handrail. These recesses allow users to firmly grip a properly proportioned grasping surface on the top of the handrail, ensuring that the user can tightly retain a grip on the handrail for all forces that are associated with attempts to arrest a fall.



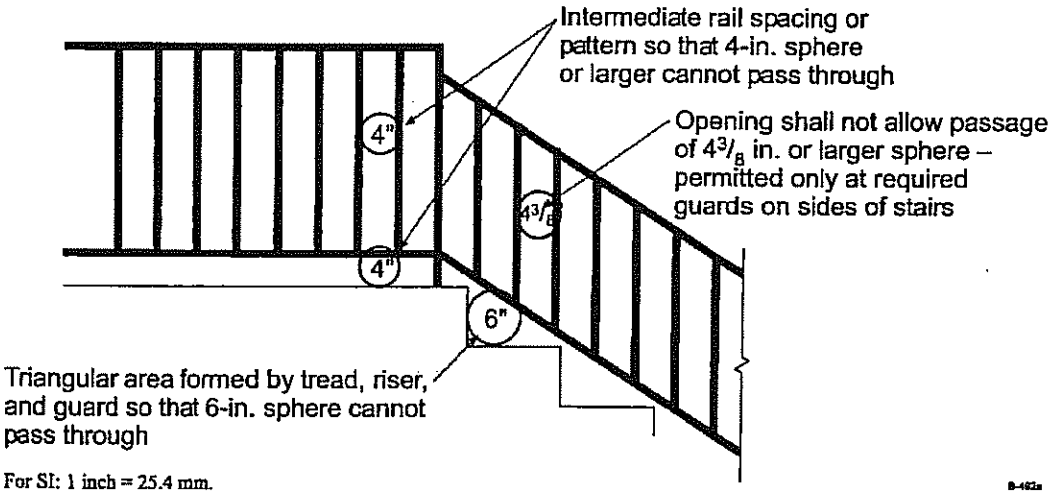
Dimensional properties of Type II handrails

Research has shown that Type II handrails have graspability that is essentially equal to or greater than the graspability of handrails meeting the long-accepted and codified shape and size defined as Type I.

Topic: Opening Limitations | **Category:** Building Planning
Reference: IRC R312.3 | **Subject:** Guards

Code Text: *Required guards shall not have openings from the walking surface to the required guard height which allow passage of a sphere 4 inches (102 mm) in diameter.* See exceptions for 1) triangular openings formed by riser, tread, and bottom rail, and 2) guards on open sides of stairs.

Discussion and Commentary: Guards must be constructed so that they not only prevent people from falling over them but also prevent children from crawling through them. The criteria spacing was chosen after many years of research and discussion. The chance of even a very small child being able to get through such a narrow opening is very low.

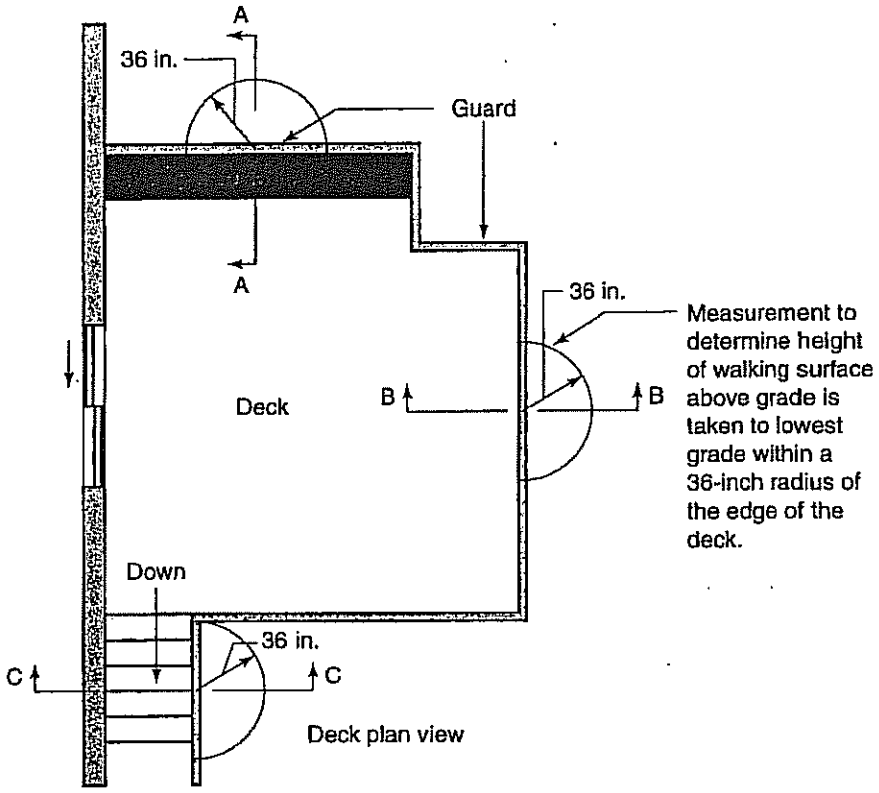


In addition to limiting the opening size along the open sides of stairways, the code addresses the hazard created by open risers. Section R311.7.4.3 allows the use of open risers but only where the opening between the treads does not permit the passage of a 4-inch-diameter sphere.

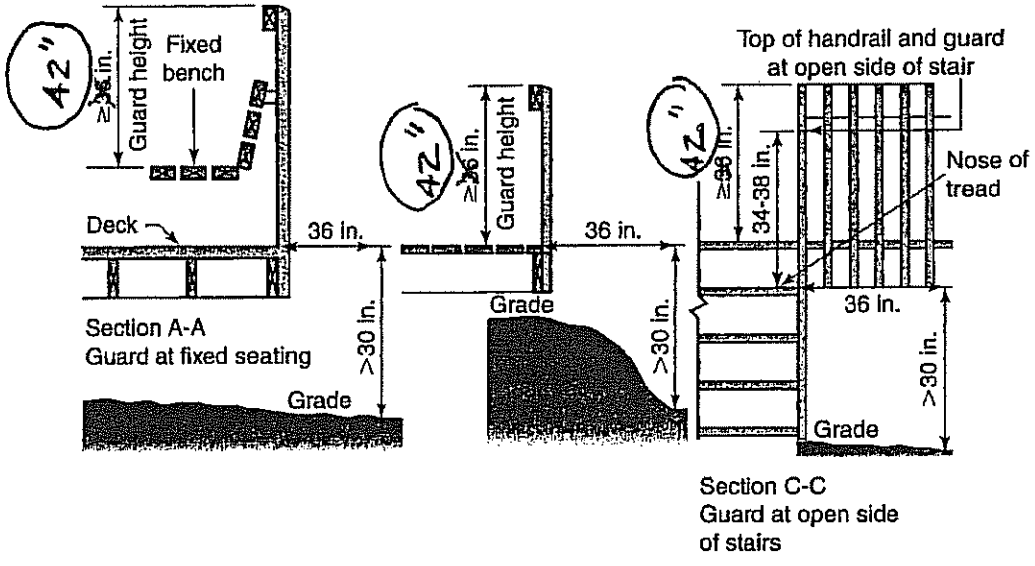
R312
Guards

CHANGE TYPE: Modification

CHANGE SUMMARY: When determining where a guard is required, the vertical distance from the walking surface to the grade or floor below is measured to the lowest point within 36 inches horizontally from the edge of the open-sided walking surface. In determining the minimum height of a guard, fixed seating is considered the same as a



Determining required guard locations



Determining required guard locations

R315

Carbon Monoxide Alarms

CHANGE TYPE: Addition

CHANGE SUMMARY: The 2009 IRC requires carbon monoxide alarms in new dwellings and in existing dwellings when work requiring a permit takes place. The carbon monoxide alarms must be installed in the immediate vicinity of sleeping areas.

2009 CODE: **Section R315 Carbon Monoxide Alarms**

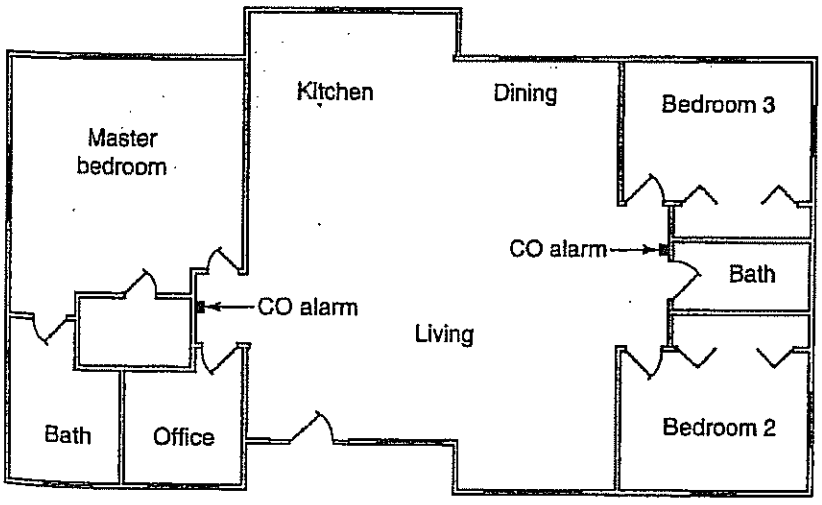
R315.1 Carbon Monoxide Alarms. For new construction, an approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units within which fuel-fired appliances are installed and in dwelling units that have attached garages.

R315.2 Where Required in Existing Dwellings. Where work requiring a permit occurs in existing dwellings that have attached garages or in existing dwellings within which fuel-fired appliances exist, carbon monoxide alarms shall be provided in accordance with Section R315.1.

R315.3 Alarm Requirements. Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

CHANGE SIGNIFICANCE: Carbon monoxide alarms are now required in new dwelling units constructed under the 2009 IRC. Because the source of unsafe levels of carbon monoxide in the home is typically from faulty operation of a fuel-fired furnace or water heater, or from the exhaust of an automobile, this new requirement applies only to homes containing fuel-fired appliances or having an attached garage. Carbon

R315 continues



Carbon monoxide (CO) alarm installed in the immediate vicinity of each sleeping area

R317.3

Fasteners and Connectors in Contact with Treated Wood

CHANGE TYPE: Modification

CHANGE SUMMARY: The fastener requirements have been expanded to include fasteners and connectors in contact with preservative-treated and fire-retardant-treated wood. New subsections distinguish between fire-retardant-treated wood (FRTW) in exterior and interior applications, deferring to the manufacturer's recommendations for fasteners in an interior location.

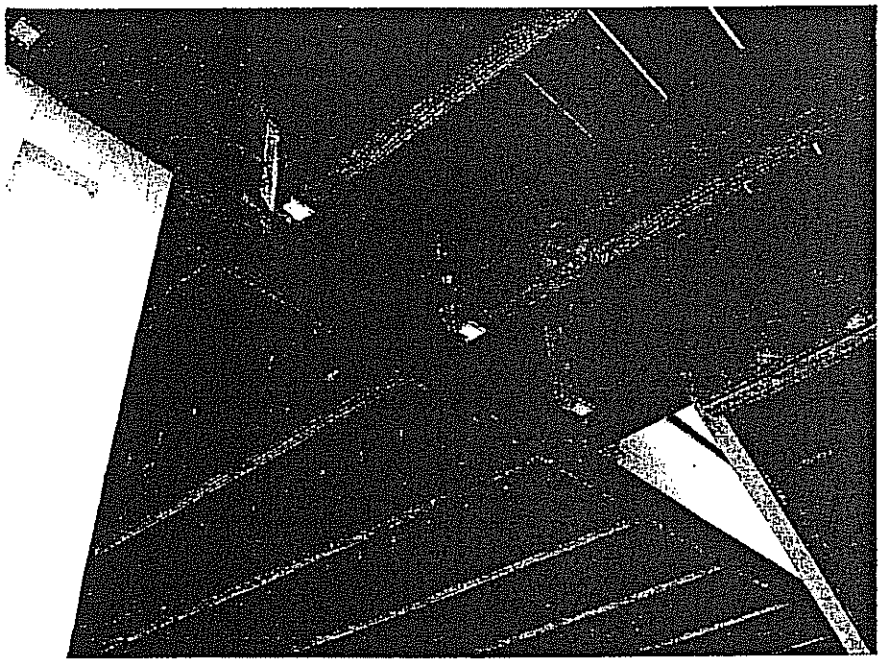
~~R319.3~~ R317.3 Fasteners and Connectors in Contact with Preservative-treated and Fire-retardant-treated Wood. Fasteners ~~for~~ and connectors in contact with ~~pressure-~~preservative-treated wood and fire-retardant-treated wood shall be ~~of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper~~ in accordance with this section. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

R317.3.1 Fasteners for Preservative-treated Wood. Fasteners for preservative-treated wood shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Coating types and weights for connectors in contact with preservative-treated wood shall be in accordance with the connector manufacturer's recommendations. In the absence of manufacturer's recommendations, a minimum of ASTM A 653 type G185 zinc-coated galvanized steel, or equivalent, shall be used.

Exceptions:

1. One-half-inch (12.7 mm) diameter or ~~larger~~ greater steel bolts.
2. Fasteners other than nails and timber rivets shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

R317.3 continues



R317.3 continued

R317.3.2 Fastenings for Wood Foundations. Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

R317.3.3 Fasteners for Fire-retardant-treated Wood used in Exterior Applications or Wet or Damp Locations. Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails and timber rivets shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

R317.3.4 Fasteners for Fire-retardant-treated Wood used in Interior Applications. Fasteners for fire-retardant-treated wood used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of the manufacturer's recommendations, Section R317.3.3 shall apply.

CHANGE SIGNIFICANCE: Changes to this section related to fasteners and connectors in contact with preservative-treated wood intend to clarify the applicable referenced standards and the minimum zinc coating weights for galvanized products. The standards are different for fasteners and connectors. Connectors include joist hangers, metal straps, and other metal products for connecting wood structural members, while fasteners typically are nails, screws and bolts. ASTM A 153, *Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware*, is the recognized standard for fasteners, which typically receive a coating of 1.0 ounce per square foot. ASTM A 653, *Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-iron Alloy-coated (Galvanized) by the Hot-dip Process*, is the recognized standard for connectors manufactured from sheet goods. The current industry standard for connectors in contact with preservative-treated wood in a wet, damp or exterior location is ASTM A 653 type G60 or 0.60 ounce of zinc per square foot. The code now includes corrosion-resistance requirements for connectors in contact with preservative-treated wood in both interior and exterior locations that reflect the connector manufacturer's recommendations. If recommendations are not available, ASTM A 653 type G185, applies. The G185 designation indicates a coating thickness of 1.85 ounces of zinc per square foot or 3 times the current industry practice.

The other new provisions in Section R317 address fasteners for use with fire-retardant-treated wood (FRTW). The code now recognizes the manufacturer's recommendations for fasteners in contact with FRTW in interior applications. Fasteners in interior applications have not experienced corrosion problems compared with those in wet, damp, or exterior locations. Though moved to a new section for FRTW, the code still recognizes that fasteners appropriate for preservative-treated wood are also appropriate for FRTW in exterior, damp, or wet locations.