Deck Inspection for New and Existing Construction

Code References – 2015 Editions

The International Residential Code and International Building Code feature regulations on the connections and materials used to construct or retrofit a deck.

The information contained in the Deck Inspection for New and Existing Construction course is a summary of the requirements of these codes as they pertain to the common concerns found in a typical home inspection. The building codes contain other requirements regarding aspects of deck construction that are not addressed in the course; check the codes for details. Check with your local building department to verify what building codes have been adopted in your area.

Any selection of products for a specific application should be made by a qualified professional. Simpson Strong-Tie recommends that deck designs be approved by the local building department before construction begins.

The information in the course contains code references from the 2009, 2012 and 2015 editions of the International Residential Code (IRC), International Building Code (IBC), and AWC Prescriptive Residential Wood Deck Construction Guide (DCA 6).

This document contains 2015 IRC, IBC and DCA 6 code references that accompany the Deck Evaluation Checklist handout.

Contents

1. Stairs

Checklist Item 1.A

Note: If the deck does not feature stairs, Section 1 will not be applicable.

Checklist Item 1.B

2015 IRC R317.1 Location required

Protection of wood and wood based products from decay shall be provided … by the use of naturally durable wood or wood that is preservative-treated in accordance with AWPA U1 for the species, product, preservative and end use. Preservatives shall be listed in Section 4 of AWPA U1. …

2015 IRC R317.1.1 Field treatment

Field-cut ends, notches and drilled holes of preservative-treated wood shall be treated in the field in accordance with AWPA M4.

2015 IRC R317.1.2 Ground contact

All wood in contact with the ground, embedded in concrete in direct contact with the ground or embedded in concrete exposed to the weather that supports permanent structures intended for human occupancy shall be approved pressure-preservative-treated wood suitable for ground contact use …

2015 IRC R317.1.3 Geographical areas

In geographical areas where experience has demonstrated a specific need, approved naturally durable or pressure-preservative-treated wood shall be used for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances when those members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering that would prevent moisture or water accumulation on the surface or at joints between members. …

2015 AWC NDS 4.4.3.1 Notches

End notches, located at the ends of sawn lumber bending members for bearing over a support, shall be permitted, and shall not exceed 1/4 the beam depth.

Note: Decay is not visible to the eye until the wood has lost approximately 10% of its weight. By this point, there is a significant loss of bending strength. Field notched wood shall be treated in the field. Typically, it is not treated in the field and therefore notching will lead to decay and rot. Notching may also cause cracks to develop and propagate from the corner of the notch. It's important to note that notching a 4x4 is not permitted. There is not enough cross sectional area to permit a let-in-notch since notches located at the ends of sawn lumber shall not exceed 1/4 the beam depth.

Checklist Item 1.C

2015 IRC R311.7.1 Width

Stairways shall not be less than 36 inches (914 mm) in clear width at all points above the permitted handrail height and below the required headroom height. Handrails shall not project more than 4-1/2 inches (114 mm) on either side of the stairway and the minimum clear width of the stairway at and below the handrail height, including treads and landings, shall not be less than 31-1/2 inches (787 mm) where a handrail is installed on one side and 27 inches (698 mm) where handrails are provided on both sides.

Exception: The width of spiral stairways shall be in accordance with Section R311.7.10.1.

Checklist Item 1.D

2015 IRC R311.7.5.1 Risers

The maximum riser height shall be 7-3/4 inches (196 mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). …

Checklist Item 1.E

2015 IRC R311.7.5.2 Treads

The minimum tread depth shall be 10 inches (254 mm). 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 tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

Checklist Item 1.D/E.1

2015 IRC R311.7.5.1 Risers

… Open risers are permitted provided that the opening between treads does not permit the passage of a 4-inch-diameter (102 mm) sphere. …

2015 IBC 1011.5.5.3 Solid risers

… Solid risers are not required for stairways that are not required to comply with Section 1007.3, provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm). …

Checklist Item 1.F

2015 IRC R312.1.1 Where required

Guards shall be located along open-sided walking surfaces, including stairs, ramps and landings, that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Insect screening shall not be considered as a guard.

2015 IBC 1015.2 Where required

Guards shall be located along open-sided walking surfaces, including mezzanines, equipment platforms, stairs, ramps and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Guards shall be adequate in strength and attachment in accordance with Section 1607.8. …

Checklist Item 1.F.1

2015 IRC R312.1.2 Height

Required guards at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches (914 mm) high measured vertically above the adjacent walking surface or the line connecting the leading edges of the treads.

Exceptions: (1) Guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads. (2) Where the top of a guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

Checklist Item 1.F.2

2015 IRC R311.7.8.3 Grip-size

All required handrails shall be of one of the following types or provide equivalent graspability. (1) Type I. Handrails with a circular cross section shall have an outside diameter of at least 1-1/4 inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6-1/4 inches (160 mm) with a maximum cross section of dimension of 2-1/4 inches (57 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm). (2) 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). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

Checklist Item 1.F.3

2015 IRC R312.1.3 Opening limitations

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.

Exceptions: … (2) Guards on the open sides of stairs shall not have openings which allow passage of a sphere 4-3/8 inches (111 mm) in diameter.

Checklist Item 1.F.4

2015 IRC R311.7.8.2 Continuity

Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1-1/2 inches (38 mm) between the wall and the handrails. …

Checklist Item 1.F.5

2015 IRC Table R301.5 Minimum uniformly distributed live loads (in pounds per square foot)

Use: Guardrails and handrails[d]
Live load: 200[h]

d. A single concentrated load applied in any direction at any point along the top.

h. Glazing used in handrail assemblies and guards shall be designed with a safety factor of 4. The safety factor shall be applied to the top of the rail, and to the load on the in-fill components. These loads shall be determined independent of one another, and loads are assumed not to occur with any other live load.

2015 IBC 1607.8.1.1 Concentrated load

Handrails and guards shall also be designed to resist a concentrated load of 200 pounds (0.89 kN) in accordance with Section 4.5.1 of ASCE 7.

Checklist Item 1.G

2015 AWC DCA 6 Stair requirements (p. 20)

… Stair stringers shall not span more than the dimensions shown in Figure 28. If the stringer span exceeds these dimensions, then a 4x4 post may be provided to support the stringer and shorten its span length. …

CUT STRINGER: Max. span = 6'-0"

SOLID STRINGER: Max. span = 13'-3"

Checklist Item 1.G.1

2015 IRC Table R301.5 Minimum uniformly distributed live loads (in pounds per square foot)

Use: Balconies (exterior) and decks[e]
Live load: 40

c. Individual stair treads shall be designed for the uniformly distributed live load or a 300-pound concentrated load acting over an area of 4 square inches, whichever produces the greater stresses.

e. See Section R507.1 for decks attached to exterior walls.

2015 IBC Table 1607.1 Minimum uniformly distributed live loads and minimum concentrated live loads

#30. Stairs and exits: One- and two-family dwellings

Uniform (psf): 40

Concentrated (lb.): 300[f]

f. The minimum concentrated load on stair treads shall be applied on an area of 2 inches by 2 inches. This load need not be assumed to act concurrently with the uniform load.

Checklist Item 1.G.2

2015 IRC R311.7.3 Vertical rise

A flight of stairs shall not have a vertical rise larger than 147 inches (3734 mm) between floor levels or landings.

2015 IBC 1011.8 Vertical rise

A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings. …

Checklist Item 1.G.3

2015 AWC DCA 6 Stair requirements (pp. 20-21)

Figure 29. Tread connection requirements:

SOLID STRINGER: 2x4 ledgers, each side, full depth of tread; attach with (4) 10d threaded nails or (4) #8 wood screws ≥ 3" long.

Checklist Item 1.G.4

2015 IRC R312.1.3 Opening limitations

… The triangular openings at the open side of a stair, formed by the riser, tread and bottom rail of a guard, shall not allow the passage of a sphere 6 inches (153 mm) in diameter. …

2015 IBC 1015.4 Opening limitations

… The triangular openings at the open sides of a stair, formed by the riser, tread and bottom rail shall not allow the passage of a sphere 6 inches (153 mm) in diameter. …

Checklist Item 1.H

2015 IRC R303.7 Stairway illumination

All interior and exterior stairways shall be provided with a means to illuminate the stairs, including the landings and treads. … Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing of the stairway. …

Checklist Item 1.I

2015 IRC R317.3.1 Fasteners for preservative-treated wood

Fasteners, including nuts and washers, 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. … 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. …

2015 IRC R317.3.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet and damp locations

Fasteners, including nuts and washers, for fire-retardant-treated wood used in exterior applications or wet and 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.

Note: Metal connectors, fasteners, and anchors could corrode and lose load-carrying capacity when installed in corrosive environments or when installed in contact with corrosive materials. Although, it is common to see some corrosion in outdoor applications. Even stainless steel can corrode. The presence of some corrosion does not mean that load capacity has been affected or that failure is imminent. If significant corrosion is apparent or suspected, then the wood, fasteners, anchors, and connectors should be inspected by a qualified engineer or qualified inspector. Replacement of affected components may be appropriate.

Checklist Item 1.J

Note: All necessary holes must be filled with the proper fasteners in order for the connector to maintain its tested load capacity.

Checklist Item 1.K

2015 IRC R311.7.6 Landings for stairways

There shall be a floor or landing at the top and bottom of each stairway. The minimum width perpendicular to the direction of travel shall be no less than the width of the flight served. … Where the landing has a straight run, the minimum depth in the direction of travel shall be not less than 36 inches (914 mm). …

2. Footings/Deck Support and Posts/Columns

Checklist Item 2.A

Note: Decks shall be able to support the dead and live loads properly. See Figure 12 and Table 4 in the AWC DCA 6 for footing size, footing thickness, and post attachment options and requirements.

Checklist Items 2.A.1 and 2.A.2

2015 IRC R403.1.1 Minimum size

The minimum width, W, and thickness, T, for concrete footings shall be in accordance with Tables R403.1(1) through R403.1(3) and Figure R403.1(1) or R403.1.3, as applicable. …

2015 IRC Table R403.1(1) Minimum width and thickness for concrete footings for light-frame construction (inches)

[For any of the listed load-bearing values of soil, a footing for 1-story, slab-on-grade, conventional light-frame construction shall have a minimum width of 12 inches and a minimum thickness of 6 inches. See table for details.]

2015 IBC 1809.4 Depth and width of footings

… The minimum width of footings shall be 12 inches (305 mm).

2015 IBC Table 1809.7 Prescriptive footings supporting walls of light-frame construction

Number of floors supported by footing: 1

Width of footing (inches): 12

Thickness of footing (inches): 6

Checklist Item 2.A.3

2015 IRC R403.1.4 Minimum depth

All exterior footings shall be placed at least 12 inches (305 mm) below the undisturbed ground surface. Where applicable, the depth of the footings shall also conform to Sections R403.1.4.1 through R403.1.4.2.

2015 IRC R403.1.4.1 Frost protection

Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extended below the frost line specified in Table R301.2.(1). …

2015 IBC 1809.4 Depth and width of footings

The minimum depth of footings below the undisturbed ground surface shall be 12 inches (305 mm). …

2015 IBC 1809.5 Frost protection

Except where otherwise protected from frost, foundations and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extended below the frost line of the locality; …

Checklist Item 2.B

2015 IRC R407.3 Structural requirements

The columns shall be restrained to prevent lateral displacement at the bottom end. Wood columns shall not be less in nominal size than 4 inches by 4 inches (102 mm by 102 mm). …

2015 AWC DCA 6 Post requirements (p. 10)

All deck post sizes shall be 6x6 (nominal) or larger, and the maximum height shall be in accordance with Table 4 and measured from grade or top of foundation, whichever is highest, to the underside of the beam. Under prescriptive limits of this document, 8x8 nominal posts can be substituted anywhere in Table 4 but are limited to a maximum height of 14'-0". …

Checklist Item 2.C

2015 AWC DCA 6 Post requirements (p. 10)

All deck post sizes shall be 6x6 (nominal) or larger, and the maximum height shall be in accordance with Table 4 and measured from grade or top of foundation, whichever is highest, to the underside of the beam. Under prescriptive limits of this document, 8x8 nominal posts can be substituted anywhere in Table 4 but are limited to a maximum height of 14'-0". …

2015 IRC Table R507.8 Deck post height

Deck post size: 4 x 4
Maximum height: 8'

Deck post size: 4 x 6
Maximum height: 8'

Deck post size: 6 x 6
Maximum height: 14'

Checklist Items 2.E and 2.F

2015 IRC R407.3 Structural requirements

The columns shall be restrained to prevent lateral displacement at the bottom end. …

2015 IRC R502.9 Fastening

… Where posts and beam or girder construction is used to support floor framing, positive connections shall be provided to ensure against uplift and lateral displacement.

2015 IBC 2304.10.7 Framing requirements

… Column-and-post end connections shall be fastened to resist lateral and net induced uplift forces.

2015 IRC R507.8.1 Deck post to deck footing

… Posts shall be restrained to prevent lateral displacement at the bottom support. Such lateral restraint shall be provided by manufactured connectors installed in accordance with Section R507 and the manufacturer's instructions or a minimum post embedment of 12 inches (305 mm) in surrounding soils or concrete piers.

Checklist Item 2.F.1

Note: Unless otherwise noted, bending steel in the field may cause fractures at the bend line. Fractured steel will not carry the load and must be replaced.

Checklist Item 2.F.2

2015 IRC R502.6 Bearing

The ends of each joist, beam or girder shall have not less than 1-1/2 inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on masonry or concrete except where supported on a 1-inch by 4-inch (25.4 mm by 102 mm) ribbon strip and nailed to the adjacent stud or by the use of approved joist hangers. …

2015 IRC R507.7 Deck joist and deck beam bearing

The ends of each joist and beam shall have not less than 1-1/2 inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on concrete or masonry for the entire width of the beam. Joist framing into the side of a ledger board or beam shall be supported by approved joist hangers. Joists bearing on a beam shall be connected to the beam to resist lateral displacement.

Checklist Item 2.G

2015 AWC DCA 6 Post requirements (p. 10)

Provide diagonal bracing parallel to the beam at each corner post greater than 2'-0" in height as shown in Figure 10. Diagonal bracing is prohibited on center posts. …

Checklist Item 2.H

2015 IRC R317.3.1 Fasteners for preservative-treated wood

Fasteners, including nuts and washers, 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. … 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. …

2015 IRC R317.3.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet and damp locations

Fasteners, including nuts and washers, for fire-retardant-treated wood used in exterior applications or wet and 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.

Note: Metal connectors, fasteners, and anchors could corrode and lose load-carrying capacity when installed in corrosive environments or when installed in contact with corrosive materials. Although, it is common to see some corrosion in outdoor applications. Even stainless steel can corrode. The presence of some corrosion does not mean that load capacity has been affected or that failure is imminent. If significant corrosion is apparent or suspected, then the wood, fasteners, anchors, and connectors should be inspected by a qualified engineer or qualified inspector. Replacement of affected components may be appropriate.

Checklist Item 2.I

Note: All necessary holes must be filled with the proper fasteners in order for the connector to maintain its tested load capacity.

3. Beams and Joists

Checklist Item 3.A

2015 AWC DCA 6 Beam size and assembly requirements (pp. 5-8)

… Where multiple 2x members are used, the deck's beam is assembled by attaching the members identified in Table 3 in accordance with Figure 4. [Table R602.3(1)]

FIGURE 4: BEAM ASSEMBLY DETAILS:

10d threaded nail or #10 wood screw ≥ 3" long, staggered in 2 rows.

2 threaded nails or screws at each end or splice end; splices shall be located only over interior posts (Figure 3).

2015 IRC R507.6 Deck beams

Maximum allowable spans for wood deck beams, as shown in Figure R507.6, shall be in accordance with Table R507.6. Beam piles shall be fastened with two rows of 10d (3-inch x 0.128-inch) nails minimum at 16 inches (406 mm) on center along each edge. …

Checklist Item 3.B

2015 IRC R502.6 Bearing

The ends of each joist, beam or girder shall have not less than 1-1/2 inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on masonry or concrete except where supported on a 1-inch by 4-inch (25.4 mm by 102 mm) ribbon strip and nailed to the adjacent stud or by the use of approved joist hangers. …

2015 IRC R507.7 Deck joist and deck beam bearing

The ends of each joist and beam shall have not less than 1-1/2 inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on concrete or masonry for the entire width of the beam. Joist framing into the side of a ledger board or beam shall be supported by approved joist hangers. Joists bearing on a beam shall be connected to the beam to resist lateral displacement.

2015 IRC R507.6 Deck beams

… Splices of multispan beams shall be located at interior post locations.

Checklist Item 3.C

2015 IRC R502.9 Fastening

… Where posts and beam or girder construction is used to support floor framing, positive connections shall be provided to ensure against uplift and lateral displacement.

2015 IRC R507.7 Deck joist and deck beam bearing

… Joists bearing on a beam shall be connected to the beam to resist lateral displacement.

Checklist Item 3.D

2015 IRC R502.3 Allowable joist spans

Spans for floor joists shall be in accordance with Tables R502.3.1(1) and R502.3.1(2). For other grades and species and for other loading conditions, refer to the AF&PA Span Tables for Joists and Rafters.

2015 IRC R502.3.2 Other floor joists

Table R502.3.1(2) shall be used to determine the maximum allowable span of floor joists that support all other areas of the building, other than sleeping rooms and attics, provided that the design live load does not exceed 40 pounds per square foot (1.92 kPa) and the design dead load does not exceed 20 pounds per square foot (0.96 kPa).

2015 IRC R507.5 Deck joists

Maximum allowable spans for wood deck joists, as shown in Figure R507.5, shall be in accordance with Table R507.5. Deck joists shall be permitted to cantilever not greater than one-fourth of the actual, adjacent joist span.

Checklist Item 3.E

2015 IRC R502.6 Bearing

The ends of each joist, beam or girder shall have not less than 1-1/2 inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on masonry or concrete except where supported on a 1-inch by 4-inch (25.4 mm by 102 mm) ribbon strip and nailed to the adjacent stud or by the use of approved joist hangers. …

2015 IRC R507.7 Deck joist and deck beam bearing

The ends of each joist and beam shall have not less than 1-1/2 inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on concrete or masonry for the entire width of the beam. Joist framing into the side of a ledger board or beam shall be supported by approved joist hangers. Joists bearing on a beam shall be connected to the beam to resist lateral displacement.

2015 IRC R507.7.1 Deck post to deck beam

Deck beams shall be attached to deck posts in accordance with Figure R507.7.1 or by other equivalent means capable to resist lateral displacement. Manufactured post-to-beam connectors shall be sized for the post and beam sizes. All bolts shall have washers under the head and nut.

Exception: Where deck beams bear directly on footings in accordance with Section R507.8.1.

Checklist Item 3.E.1

Note: Unless otherwise noted, bending steel in the field may cause fractures at the bend line. Fractured steel will not carry the load and must be replaced.

Checklist Item 3.E.2

Note: Some hangers may have double-shear nailing – an innovation that distributes the load through two points on each joist nail for greater strength. This allows for fewer nails, faster installation, and the use of all common nails for the same connection. Double-shear nailing shall use a minimum of 2-1/2" long nails or connector manufacturer approved structural screws.

Checklist Item 3.F

2015 IRC R507.1 Decks

Wood-framed decks shall be in accordance with this section or Section R301 for materials and conditions not prescribed within. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads.

Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. For decks with cantilevered framing members, connections to exterior walls or other framing members, shall be designed and constructed to resist uplift resulting from the full live load specified in Table R301.5 acting on the cantilevered potion of the deck.

Checklist Item 3.G

2015 IRC R317.3.1 Fasteners for preservative-treated wood

Fasteners, including nuts and washers, 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. … 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. …

2015 IRC R317.3.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet and damp locations

Fasteners, including nuts and washers, for fire-retardant-treated wood used in exterior applications or wet and 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.

Checklist Item 3.H

Note: All necessary holes must be filled with the proper fasteners in order for the connector to maintain its tested load capacity.

Checklist Item 3.I

2015 IRC R317.1 Location required

Protection of wood and wood based products from decay shall be provided … by the use of naturally durable wood or wood that is preservative-treated in accordance with AWPA U1 for the species, product, preservative and end use. Preservatives shall be listed in Section 4 of AWPA U1. …

2015 IRC R317.1.1 Field treatment

Field-cut ends, notches and drilled holes of preservative-treated wood shall be treated in the field in accordance with AWPA M4.

2015 IRC R317.1.2 Ground contact

All wood in contact with the ground, embedded in concrete in direct contact with the ground or embedded in concrete exposed to the weather that supports permanent structures intended for human occupancy shall be approved pressure-preservative-treated wood suitable for ground contact use …

2015 IRC R317.1.3 Geographical areas

In geographical areas where experience has demonstrated a specific need, approved naturally durable or pressure-preservative-treated wood shall be used for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances when those members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering that would prevent moisture or water accumulation on the surface or at joints between members. …

4. Ledger

Checklist Item 4.A

Note: If the deck is free-standing, Section 4 will not be applicable.

Checklist Item 4.B

2015 IRC R507.2.1 Ledger details

… Deck ledgers shall not be supported on stone or masonry veneer.

2015 IRC R507.1 Decks

… Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads. …

Checklist Item 4.C

2015 IRC R507.1 Decks

… Where a positive connection to the primary structure cannot be made or verified during inspection, decks shall be self-supporting. …

Checklist Item 4.D

2015 IRC R703.4 Flashing

Approved corrosion-resistive flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. …

2015 IBC 1405.4 Flashing

Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect it to the exterior. Flashing shall be installed at … porches, decks, balconies and similar projections … where moisture could enter the wall. …

Note: A combination of self-sealing and Z flashing has been recommended to ensure moisture cannot reach the building. The intersection of the house and deck is extremely vulnerable to moisture problems. The flashing material shall be layered and applied shingle-fashion in manner since rainwater can travel in all directions.

5. Deck Boards

Checklist Item 5.A

2015 IRC R507.3.5 Installation of plastic composites

Plastic composite deck boards, stair treads, guards and handrails shall be installed in accordance with the manufacturer's instructions.

2015 IRC R507.3 Plastic composite deck boards, stair treads, guards, or handrails

Plastic composite exterior deck boards, stair treads, guards and handrails shall comply with the requirements of ASTM D 7032 and the requirements of Section 507.3.

2015 IRC R507.4 Decking

Maximum allowable spacing for joists supporting decking shall be in accordance with Table R507.4. Wood decking shall be attached to each supporting member with not less than (2) 8d threaded nails or (2) No. 8 wood screws.

2015 AWC DCA 6 Decking requirements (p. 3)

All decking shall be composed of dimension lumber (2" nominal thickness) or span rated decking in accordance with the American Lumber Standard Committee Policy for Evaluation or Recommended Spans for Span Rated Decking Products (November 5, 2004). …

Checklist Item 5.B

2015 IRC R317.1 Location required

Protection of wood and wood based products from decay shall be provided … by the use of naturally durable wood or wood that is preservative-treated in accordance with AWPA U1 for the species, product, preservative and end use. Preservatives shall be listed in Section 4 of AWPA U1. …

2015 IRC R317.1.1 Field treatment

Field-cut ends, notches and drilled holes of preservative-treated wood shall be treated in the field in accordance with AWPA M4.

2015 IRC R317.1.2 Ground contact

All wood in contact with the ground, embedded in concrete in direct contact with the ground or embedded in concrete exposed to the weather that supports permanent structures intended for human occupancy shall be approved pressure-preservative-treated wood suitable for ground contact use …

2015 IRC R317.1.3 Geographical areas

In geographical areas where experience has demonstrated a specific need, approved naturally durable or pressure-preservative-treated wood shall be used for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances when those members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering that would prevent moisture or water accumulation on the surface or at joints between members. …

Checklist Item 5.C

2015 AWC DCA 6 Decking requirements (p. 3)

… Attach decking to each joist with 2-8d threaded nails or 2-#8 screws. Space decking boards approximately 1/8" apart. … Decking placement may range from an angle perpendicular to the joists to an angle of 45 degrees to the joists. Each segment of decking must bear on a minimum or 3 joists (or 3 supports). …

2015 IRC R507.4 Decking

Maximum allowable spacing for joists supporting decking shall be in accordance with Table R507.4. Wood decking shall be attached to each supporting member with not less than (2) 8d threaded nails or (2) No. 8 wood screws.

Checklist Item 5.D

2015 IRC R317.3.1 Fasteners for preservative-treated wood

Fasteners, including nuts and washers, 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. … 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. …

2015 IRC R317.3.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet and damp locations

Fasteners, including nuts and washers, for fire-retardant-treated wood used in exterior applications or wet and 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.

6. Handrail Assemblies and Guards

Checklist Item 6.A

2015 IRC R312.1.2 Height

Required guards at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches (914 mm) high measured vertically above the adjacent walking surface or the line connecting the leading edges of the treads. Exceptions: (1) Guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads. (2) Where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

2015 IBC 1015.3 Height

Required guards shall be not less than 42 inches (1067 mm) high, measured vertically as follows: (1) From the adjacent walking surfaces; (2) On stairways and stepped aisles, from the line connecting the leading edges of the tread nosings; and (3) On ramps and ramped aisles, from the ramp surface at the guard. Exceptions: (1) For occupancies in Group R-3 not more than three stories above grade in height and within individual dwelling units in occupancies in Group R-2 not more than three stories above grade in height with separate means of egress, required guards shall be not less than 36 inches (914 mm) in height measured vertically above the adjacent walking surfaces or adjacent fixed seating. (2) For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads. (3) For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of treads. …

Checklist Item 6.B

N/A

Checklist Item 6.C

2015 IRC Table R301.5 Minimum uniformly distributed live loads (in pounds per square foot)

Use: Guards and handrails[d]

Live load: 200[h]

d. A single concentrated load applied in any direction at any point along the top.

h. Glazing used in handrail assemblies and guards shall be designed with a safety factor of 4. The safety factor shall be applied to each of the concentrated loads applied at the top of the rail, and to the load on the in-fill components. These loads shall be determined independent of one another, and loads are assumed not to occur with any other live load.

2015 IBC 1607.8.1.1 Concentrated load

Handrails and guards shall be designed to resist a concentrated load of 200 pounds (0.89 kN) in accordance with Section 4.5.1 of ASCE 7.

Checklist Item 6.D

2015 IRC R312.1.3 Opening limitations

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. Exceptions: … (2) Guards on the open sides of stairs shall not have openings which allow passage of a sphere 4-3/8 inches (111 mm) in diameter.

2015 IBC 1015.4 Opening limitations

Required guards shall not have openings which allow passage of a sphere 4 inches (102 mm) in diameter from the walking surface to the required guard height. Exceptions: … (6) Within individual dwelling units and sleeping units in Group R-2 and R-3 occupancies, guards on the open sides of stairs shall not have openings which allow passage of a sphere 4-3/8 inches (111 mm) in diameter.

Checklist Item 6.E

2015 IRC R317.1 Location required

Protection of wood and wood based products from decay shall be provided … by the use of naturally durable wood or wood that is preservative-treated in accordance with AWPA U1 for the species, product, preservative and end use. Preservatives shall be listed in Section 4 of AWPA U1. …

2015 IRC R317.1.1 Field treatment

Field-cut ends, notches and drilled holes of preservative-treated wood shall be treated in the field in accordance with AWPA M4.

2015 IRC R317.1.2 Ground contact

All wood in contact with the ground, embedded in concrete in direct contact with the ground or embedded in concrete exposed to the weather that supports permanent structures intended for human occupancy shall be approved pressure-preservative-treated wood suitable for ground contact use …

2015 IRC R317.1.3 Geographical areas

In geographical areas where experience has demonstrated a specific need, approved naturally durable or pressure-preservative-treated wood shall be used for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances when those members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering that would prevent moisture or water accumulation on the surface or at joints between members. …

Checklist Item 6.F

2015 IRC R317.3.1 Fasteners for preservative-treated wood

Fasteners, including nuts and washers, 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. … 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. …

2015 IRC R317.3.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet and damp locations

Fasteners, including nuts and washers, for fire-retardant-treated wood used in exterior applications or wet and 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.

Note: Metal connectors, fasteners, and anchors could corrode and lose load-carrying capacity when installed in corrosive environments or when installed in contact with corrosive materials. Although, it is common to see some corrosion in outdoor applications. Even stainless steel can corrode. The presence of some corrosion does not mean that load capacity has been affected or that failure is imminent. If significant corrosion is apparent or suspected, then the wood, fasteners, anchors, and connectors should be inspected by a qualified engineer or qualified inspector. Replacement of affected components may be appropriate.

NOTES