303.3.3 ([F] 1104.4) Power source. here emergency illumination is required in Section 303.3.4, exit signs shall be visible under emergency illumination conditions.

Exception: Approved signs that provide continuous illumination independent of external power sources are not required to be connected to an emergency electrical system.

303.3.4 ([F] 1104.5) Illumination emergency power. The power supply shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an emergency system for the following occupancies where such occupancies require two or more means of egress:

1. Group A having 50 or more occupants.

   Exception: Assembly occupancies used exclusively as a place of worship and having an occupant load of less than 300.

2. Group B buildings three or more stories in height, buildings with 100 or more occupants above or below a level of exit discharge serving the occupants or buildings with 1,000 or more total occupants.
3. Group E in interior stairs, corridors, windowless areas with student occupancy, shops and laboratories.
4. Group F having more than 100 occupants.

   Exception: Buildings used only during daylight hours which are provided with windows for natural light in accordance with the International Building Code.

5. Group I.
6. Group M.

   Exception: Buildings less than 3,000 square feet (279 m2) in gross sales area on one story only, excluding mezzanines.

7. Group R-1.

   Exception: Where each sleeping unit has direct access to the outside of the building at grade.

8. Group R-2.

   Exception: Where each dwelling unit or sleeping unit has direct access to the outside of the building at grade.

9. Group R-4.

   Exception: Where each sleeping unit has direct access to the outside of the building at ground level.

303.3.4.1 ([F] 1104.5.1) Emergency power duration and installation. In other than Group I-2, the emergency power system shall provide power for not less than 60 minutes and consist of storage batteries, unit equipment or an on-site generator. In Group I-2, the emergency power system shall provide power for not less than 90 minutes and consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 1006.3 of the *international Building Code*.

303.3.5 ([F] 1104.6) Guards. Guards complying with this Section shall be provided at the open sides of means of egress that are more than 30 inches (762 mm) above the floor or grade below.

303.3.5.1 ([F] 1104.6.1) Height of guards. Guards shall form a protective barrier not less than 42 inches (1067 mm) high.

Exceptions:

1. Existing guards on the open side of stairs shall be not less than 30 inches (760 mm) high.
2. Existing guards within dwelling units shall be not less than 36 inches (910 mm) high.
3. Existing guards in assembly seating areas.

303.3.5.2 ([F] 1104.6.2) Opening limitations. Open guards shall have balusters or ornamental patterns such that a 6-inch-diameter (152 mm) sphere cannot pass through any opening up to a height of 34 inches (864 mm).

Exceptions:

1. At elevated walking surfaces for access to, and use of, electrical, mechanical or plumbing systems or equipment, guards shall have balusters or be of solid materials such that a sphere with a diameter of 21 inches (533 mm) cannot pass through any opening.
2. In occupancies in Group I-3, F, H or S, the clear distance between intermediate rails measured at right angles to the rails shall not exceed 21 inches (533 mm).
3. Approved existing open guards.

303.3.6 ([F] 1104.7) Size of doors. The minimum width of each door opening shall be sufficient for the occupant load thereof and shall provide a clear width of not less than 28 inches (711 mm). Where this Section requires a minimum clear width of 28 inches (711 mm) and a door opening includes two door leaves without a mullion, one leaf shall provide a clear opening width of 28 inches (711 mm). The maximum width of a swinging door leaf shall be 48 inches (1219 mm) nominal. Means of egress doors in an occupancy in Group I-2 used for the movement of beds shall provide a clear width not less than 41.5 inches (1054 mm). The height of doors shall not be less than 80 inches (2032 mm).

Exceptions:

1. The minimum and maximum width shall not apply to door openings that are not part of the required means of egress in occupancies in Groups R-2 and R-3.
2. Door openings to storage closets less than 10 square feet (0.93 m^2) in area shall not be limited by the minimum width.
3. Width of door leafs in revolving doors that comply with Section 1008.1.4.1 shall not be limited.
4. Door openings within a dwelling unit shall not be less than 78 inches (1981 mm) in height.
5. Exterior door openings in dwelling units, other than the required exit door, shall not be less than 76 inches (1930 mm) in height.
6. Exit access doors serving a room not larger than 70 square feet (6.5 m^2) shall be not less than 24 inches (610 mm) in door width.

303.3.7 ([F] 1104.8) Opening force for doors. The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. For other side-swinging, sliding and folding doors, the door latch shall release when subjected to a force of not more than 15 pounds (66 N). The door shall be set in motion when subjected to a force not exceeding 30 pounds (133 N). The door shall swing to a full-open position when subjected to a force of not more than 50 pounds (222 N). Forces shall be applied to the latch side.

303.3.8 ([F] 1104.9) Revolving doors. Revolving doors shall comply with the following:

1. A revolving door shall not be located within 10 feet (3048 mm) of the foot or top of stairs or escalators. A dispersal area shall be provided between the stairs or escalators and the revolving doors.
2. The revolutions per minute for a revolving door shall not exceed those shown in Table 303.3.8.
3. Each revolving door shall have a conforming side-hinged swinging door in the same wall as the revolving door and within 10 feet (3048 mm).

4.3. The open-ended corridors are connected on each end to an exterior exit stairway complying with Section 1026 of the *International Building Code*.

4.4. At any location in an open-ended corridor where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3 m2) or an exterior stairway shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

303.3.21 ([F] 1104.22) Minimum aisle width. The minimum clear width of aisles shall be:

1. Forty-two inches (1067 mm) for aisle stairs having seating on each side.

   Exception: Thirty-six inches (914 mm) where the aisle serves less than 50 seats.

2. Thirty-six inches (914 mm) for stepped aisles having seating on only one side.

   Exception: Thirty inches (760 mm) for catchment areas serving not more than 60 seats.

3. Twenty inches (508 mm) between a stepped aisle handrail or guard and seating when the aisle is subdivided by the handrail.

4. Forty-two inches (1067 mm) for level or ramped aisles having seating on both sides.

   Exception: Thirty-six inches (914 mm) where the aisle serves less than 50 seats.

5. Thirty-six inches (914 mm) for level or ramped aisles having seating on only one side.

   Exception: Thirty inches (760 mm) for catchment areas serving not more than 60 seats.

6. Twenty-three inches (584 mm) between a stepped stair handrail and seating where an aisle does not serve more than five rows on one side.

303.3.22 ([F] 1104.23) Stairway floor number signs. Existing stairs shall be marked in accordance with Section 1022.8 of the *International Building Code*.

303.3.23 ([F] 1104.24) Egress path markings. Existing high-rise buildings of Group A, B, E, I, M and R-1 occupancies shall be provided with luminous egress path markings in accordance with Section 1024 of the *International Building Code*.

Exception: Open, unenclosed stairwells in historic buildings designated as historic under a state or local historic preservation program.

303.4 ([F] 1105) Requirements for outdoor operations. Outdoor operations shall be in accordance with Section 303.4.1 through 303.4.1.2.

303.4.1 ([F] 1105.1) Tire storage yards. Existing tire storage yards shall be provided with fire apparatus access roads in accordance with Sections 1105.1.1 and 1105.1.2 of the *International Building Code*.

303.4.1.1 ([F] 1105.1.1 Access to piles. Access roadways shall be within 150 feet (45 720 mm) of any point in the storage yard where storage piles are located, at least 20 feet (6096 mm) from any storage pile.

303.4.1.2 ([F] 1105.1.2) Location within piles. Fire apparatus access roads shall be located within all pile clearances identified in Section 3405.4 and within all fire breaks required in Section 3405.5 of the *International Fire Code*.

F15 – 13
312.3

Proponent: Adolf Zubia. Chairman IAFC Fire and Life Safety Section, representing ICC Fire Code Action Committee (azubiamia@yahoo.com)

Revise as follows:

SECTION 312
VEHICLE IMPACT PROTECTION

312.1 General. Vehicle impact protection required by this code shall be provided by posts that comply with Section 312.2 or by other *approved* physical barriers that comply with Section 312.3.

312.2 Posts. Guard posts shall comply with all of the following requirements:

1. Constructed of steel not less than 4 inches (102 mm) in diameter and concrete filled.
2. Spaced not more than 4 feet (1219 mm) between posts on center.
3. Set not less than 3 feet (914 mm) deep in a concrete footing of not less than a 15-inch (381 mm) diameter.
4. Set with the top of the posts not less than 3 feet (914 mm) above ground.
5. Located not less than 3 feet (914 mm) from the protected object.

312.3 Other barriers. ~~Physical barriers shall be a minimum of 36 inches (914 mm) in height and shall resist a force of 12,000 pounds (53 375 N) applied 36 inches (914 mm) above the adjacent ground surface.~~ Barriers other than posts specified in Section 312.2 that are designed to resist, deflect or visually deter vehicular impact commensurate with an anticipated impact scenario shall be permitted when approved.

Reason: This proposal is submitted by the ICC Fire Code Action Committee (FCAC). This ICC committee was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes or portions thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the Fire-CAC has held 6 open meetings and numerous Regional Work Group and Task Group meetings and conference calls which included members of the committees as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the FAC website at: http://www.iccsafe.org/cs/CAC/Pages/default.aspx.

Contrary to what one might assume by reading the code, the current text of Section 312.3 is not a performance-based alternative design basis for the prescriptive provisions in Section 312.2. Instead, the two sections provide redundant and unrelated approaches to providing impact barriers, and there is no known technical relationship between the two design approaches. Section 312.2 was sourced from the Uniform Fire Code, and it was included in the IFC so that jurisdictions transitioning from the Uniform Fire Code to the IFC would not be forced into having to follow new barrier design criteria. Likewise, Section 312.3 was sourced from the BOCA National Fire Prevention Code, and it was included in the IFC so that jurisdictions transitioning from the BOCA National Fire Prevention Code to the IFC would not be forced into having to follow new barrier design criteria. Given that the 2015 IFC will be the 6th IFC edition following the consolidation of legacy codes; it no longer makes sense to retain this inconsistency. The prescriptively specified bollards specified by Section 312.2 are well-established as the default norm for compliance.

This change revises Section 312.3 so that it is truly a performance option to Section 312.2. The text deliberately establishes a broad set of goals that must be achieved by the designer to fit a site-specific application, and the requirement places the onus on the designer to demonstrate selection of a satisfactory design scenario and a suitable solution to achieve approval by the fire code official. Although one might argue that Section 312.3 might simply be deleted in favor of relying on Section 104.9 (alternate materials and methods), it makes more sense to include the suggested guidance in Section 312.3.

In reviewing this proposal, some may wonder whether it is appropriate to maintain the currently specified 12,000 pound "force" criteria. The answer is "no." This was deliberately deleted for a couple reasons. First, the 12,000-pound "force" is actually specified as a static load, i.e. a load with no associated impact velocity or acceleration. Without knowing an intended impact velocity, the kinetic energy resistance for a barrier cannot be accurately calculated. It is more appropriate for a performance requirement to accommodate determination of a suitable vehicle weight and impact speed as a design basis.

F235 – 13
1104.22

Proponent: Adolf Zubia. Chairman IAFC Fire and Life Safety Section, representing ICC Fire Code Action Committee (azubiamia@yahoo.com)

Revise as follows:

1104.22 Minimum aisle width. The minimum clear width of *aisles* shall be:

1. Forty-two inches (1067 mm) for stepped aisles ~~*aisle* stairs~~ having seating on each side.

   Exception: Thirty-six inches (914 mm) where the *aisle* serves less than 50 seats.

2. Thirty-six inches (914 mm) for stepped *aisles* having seating on only one side.

   Exceptions:

   1. Thirty inches (760 mm) for catchment areas serving not more than 60 seats.
   2. Twenty-three inches (584 mm) between a stepped aisle *handrail* and seating where an *aisle* does not serve more than five rows on one side.

3. Twenty inches (508 mm) between a stepped *aisle* handrail or guard and seating when the *aisle* is subdivided by the *handrail*.
4. Forty-two inches (1067 mm) for level or ramped *aisles* having seating on both sides.

   Exception: Thirty-six inches (914 mm) where the *aisle* serves less than 50 seats.

5. Thirty-six inches (914 mm) for level or ramped *aisles* having seating on only one side.

   Exception: Thirty inches (760 mm) for catchment areas serving not more than 60 seats.

6. ~~Twenty-three inches (584 mm) between a stepped *stair handrail* and seating where an *aisle* does not serve more than five rows on one side.~~

Reason: This proposal is submitted by the ICC Fire Code Action Committee (FCAC). This ICC committee was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes or portions thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the Fire-CAC has held 6 open meetings and numerous Regional Work Group and Task Group meetings and conference calls which included members of the committees as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the FAC website at: http://www.iccsafe.org/cs/CAC/Pages/default.aspx.

The language for aisles has been revised in IFC/IBC Section 1028.9.1 to relocate Item 6 to Exception 2 under Item 2 by E143-09/10. This section should be coordinated. The current section is inconsistent when using the term “stepped aisle” and “aisle stair”. E86-12 has changed the term to “stepped aisles” throughout the IBC. Below is the revised IBC text for clarity:.

1028.9.1 Minimum aisle width. The minimum clear width for *aisles* shall be as shown:

1. Forty-eight inches (1219 mm) for *stepped aisles* having seating on each side.

   Exception: Thirty-six inches (914 mm) where the *aisle* serves less than 50 seats.

2. Thirty-six inches (914 mm) for *aisle stairs* having seating on only one side.

   Exception: Twenty-three inches (584 mm) between an *aisle stair handrail* and seating where an *aisle* does not serve more than five rows on one side

   .
3. Twenty-three inches (584 mm) between an *aisle stair handrail* or *guard* and seating where the aisle is subdivided by a handrail.
4. Forty-two inches (1067 mm) for level or ramped *aisles* having seating on both sides.

Exceptions:

1. Thirty-six inches (914 mm) where the *aisle* serves less than 50 seats.
2. Thirty inches (762 mm) where the *aisle* does not serve more than 14 seats.

5. Thirty-six inches (914 mm) for level or ramped *aisles* having seating on only one side.

   Exception: Thirty inches (762 mm) where the *aisle* does not serve more than 14 seats.

Cost Impact: This change will not increase the cost of construction

F235-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

1104.22-F-ZUBIA-FCAC

PM11 – 13
307.1

Proponent: Roy Fyffe, Building Official, representing City of Burnet, TX (rfyffe@cityofburnent.com)

Revise as follows:

307.1 General. Every exterior and interior flight of stairs having more than four risers shall have a handrail on one side of the stair and every open portion of a stair, landing, balcony, porch, deck, ramp or other walking surface which is more than 30 inches (762mm) above the floor or grade below shall have *guards*. Handrails shall not be less than ~~30~~ 34 inches (~~762mm~~ 864 mm) in height or more than ~~42~~ 38 inches (~~1067~~ 965mm) in height measured vertically above the nosing of the tread or above the finished floor of the landing or walking surfaces. *Guards* shall not be less than ~~30~~ 36 inches (~~762~~ 914 mm) in height above the floor of the landing, balcony, porch, deck, or ramp or other walking surface.

Exception: *Guards* shall not be required where exempted by the adopted building code.

Reason: The revised text will provide for continuity and clarity between both IPMC and IRC codes, thus lessening any confusion for building and property maintenance inspectors.

Cost Impact: The code change proposal will not increase the cost of construction.

PM11-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

307.1-PM-FYFFE

RB31– 13
R202 (New)

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association (sma@stairways.org)

Add new definition as follows:

SECTION R202
DEFINITIONS

STAIRWAY, SPIRAL. A stairway with a plan view of closed circular form and uniform section-shaped treads radiating from a minimum-diameter circle.

Reason: The IRC does not define spiral stairway however the term is defined in the IBC and consequently R201.3 states this definition would apply to spiral stairs in the IRC. The IBC definition of spiral stairway is:

> **STAIRWAY, SPIRAL.** A stairway having a closed circular form in its plan view with uniform section-shaped treads attached to and radiating from a minimum-diameter supporting column.

This definition is flawed. The requirement of a supporting column is superfluous and restricts many safe designs that conform to the spiral stairway geometry but provide a supporting stringer and a guard with additional handrail instead of a column. These space saving stairs function as spiral stairways with the preferred walking path at the outside perimeter and enhance their safe use with handrails on both sides without intruding into the required width as when wrapping a support column with a handrail. This change would not restrict the continued use of a column or require an additional handrail.

This change is part of several related changes being proposed to clarify the regulations related to spiral stairways. In particular please see our change to R311.7.10.1 limiting the minimum diameter and defining the point at which curved stair requirements would apply.

Cost Impact: This code change will not increase the cost of construction.

RB31-13

Public Hearing: Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

R202=STAIWAY, SPIRAL (NEW)-RB-COOPER

RB56 – 13
R301.5, Table R301.5

Proponent: Stephen Kerr, S.E., Josephson Werdowatz and Associates Inc., representing self (skerr@jwa-se.com)

Revise as follows:

R301.5 Live load. The minimum uniformly distributed and concentrated live loads shall be as provided in Table R301.5.

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
AND MINIMUM CONCENTRATED LIVE LOADS
(in pounds per square foot)

OCCUPANCY OR USE	LIVE LOAD UNIFORM (psf)	CONCENTRATED (lbs.)
Uninhabitable attics without storage[b]	10	-
Uninhabitable attics with limited storage[b,g]	20	-
Habitable attics and attics served with fixed stairs	30	-
Balconies (exterior) and decks[e]	40	-
Fire escapes	40	-
Guardrails and handrails[d]	- 200[h]	200[h]
Guardrail in-fill components[f]	- 50[h]	50[h]
Passenger vehicle garages[a]	40 50[a]	Note a
Rooms other than sleeping room	40	-
Sleeping rooms	30	-
Stairs	40[e]	300[c]

a. Elevated garage floors shall be capable of supporting a 3,000 2,000-pound load applied on an area of over a 20 square-inches area.

b *(No change to current text)*

c. The minimum concentrated load on stair treads shall be applied on 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. This load need not be assumed to act concurrently with the uniform load., whichever produces the greater stresses.

d through h *(No change to current text)*

Reason: As currently presented, the tile of Table R301.5 states that the loads as uniformly distributed and that the loads are in pounds per square foot. However, this is incorrect, since the guardrail and handrail loads shown are concentrated loads. By splitting the loads into two columns, the Live Load table will accurately represent what type of live load is shown. The passenger vehicle garage loads were also changed to reflect the changes that occurred to the live load in the 2012 IBC.

These changes will make the IRC Live Load table match the format and values of the IBC and ASCE 7 Live Load tables.

Cost Impact: This code change proposal will not increase construction cost.

RB56-13

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R301.5-RB-KERR

RB57 – 13
Table R301.5

Proponent: Larry Wainright, Qualtim, representing the Structural Building Components Association (lwainright@qualtim.com)

Revise as follows:

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

(Portions of table not shown remain unchanged)

a through f *(No change to current text)*

g. Uninhabitable attics with limited storage are those where the maximum clear height between joists and rafters is 42 inches or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. The live load need only be applied to those portions of the joists or truss bottom chords where all of the following conditions are met:

1. The attic area is accessible from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the attic is a minimum of 30 inches.
2. The slopes of the joists or truss bottom chords are no greater than 2 inches vertical to 12 units horizontal.
3. Required insulation depth is less than the joist or truss bottom chord member depth.

The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed non-concurrent live load of not less than 10 lb/ft2.

h. *(No change to current text)*

Reason The intent of this proposal is to bring the IRC into agreement with the IBC, Table 1607.1, footnote 'i"; ASCE 7, Table 4-1, footnotes "l" and "m" and the IRC Table R301.5, footnote "b".

The requirement for the 10 PSF live load on those portions of the bottom chords not serving as storage areas was originally intended to reflect the requirement to provide a 10 PSF load per Table R301.5, footnote "b" for uninhabitable attics without storage on those portions of the joist or truss where a storage load is not applied. Footnote b clearly indicates that this is a non-concurrent load (intended for occasional access for maintenance).This is confirmed by the Commentary to the 2012 IBC, Table 1607.1 which states in part, "…Historically, a minimum load of 10 psf (0.48 kN/m2) has been viewed as appropriate where occasional access to the attic is anticipated for maintenance purposes, but significant storage is restricted by physical constraints, such as low clearance or the configuration of truss webs. It provides a minimum degree of structural integrity, allowing for occasional access to an attic space for maintenance purposes. ***Allowing the application of this load to be independent of other live loads is deemed appropriate, since it would be rare for this load and other maximum live loads to occur at once."[emphasis added]***

Current truss design methodology also treats this 10 PSF non-storage load as a non-concurrent live load intended for occasional access for maintenance purposes. Furthermore, the change to this section (S57-09/10) was intended to coordinate the language with the ASCE 7-10 which was in draft form at the time the original proposal was submitted. During the public comment period, ASCE 7 was corrected to show that this is a non-concurrent load but the change was not picked up in the IRC. This code change simply coordinates this footnote with Table 1607.1, Table R301.5 footnote b, ASCE 7, and with the original intent of S57-09/10.

For reference, Table R301.5, footnote "b" states:

b. Uninhabitable attics without storage are those where the maximum clear height between the joist and rafter is less than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. **This live load need not be assumed to act concurrently with any other live load requirements.**

ASCE 7-10, Table 4-1,footnotes "l" and "m" state:

[l] Uninhabitable attic areas without storage are those where the maximum clear height between the joist and rafter is less than 42 in. (1,067 mm), or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 in. (1,067 mm) in height by 24 in. (610 mm) in width, or greater, within the plane of the trusses. **This live load need not be assumed to act concurrently with any other live load requirement.**

[m] Uninhabitable attic areas with storage are those where the maximum clear height between the joist and rafter is 42 in. (1,067 mm) or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 in. (1,067 mm) in height by 24 in. (610 mm) in width, or greater, within the plane of the trusses. At the trusses, the live load need only be applied to those portions of the bottom chords where both of the following conditions are met:

i. The attic area is accessible from an opening not less than 20 in. (508 mm) in width by 30 in. (762 mm) in length that is located where the clear height in the attic is a minimum of 30 in. (762 mm); and

ii. The slope of the truss bottom chord is no greater than 2 units vertical to 12 units horizontal (9.5% slope).

The remaining portions of the bottom chords shall be designed for a uniformly distributed nonconcurrent live load of not less than 10 lb/ft2 (0.48 kN/m2).

IBC Table 1607.1, footnote "l" states:

i. Uninhabitable attics without storage are those where the maximum clear height between the joists and rafters is less than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. **This live load need not be assumed to act concurrently with any other live load requirements.**

Note that the IBC, Table 1607.1 footnote "j" is also inconsistent with ASCE 7, the IRC and the IBC, table 1607.1, footnote "i".

Cost Impact: This code change will not increase the cost of construction.

RB57-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R301.5-RB-WAINRIGHT

RB58 – 13
Table R301.5, R311.7.8.1, R317.4, R317.4.1, R507.3

Proponent: Glenn Mathewson, MCP, representing the North American Deck and Railing Association (GlennMathewson@nadra.org)

Revise as follows:

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

USE	LIVE LOAD
Uninhabitable attics without storage[b]	10
Uninhabitable attics with limited storage[b, g]	20
Habitable attics and attics served with fixed stairs	30
Balconies (exterior) and decks[e]	40
Fire escapes	40
Guards~~rails~~ and handrails[d]	200[h]
Guard~~rail~~ in-fill components[f]	50[h]
Passenger vehicle garages[a]	50[a]
Rooms other than sleeping room	40
Sleeping rooms	30
Stairs	40[c]

R311.7.8.1 Height. Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

Exceptions:

1. The use of a volute, turnout or starting easing shall be allowed over the lowest tread.
2. When handrail fittings or bending are used to provide continuous transition between flights, transitions at winder treads, the transition from handrail to guard~~rail~~ or used at the start of a flight, the handrail height at the fittings or bending shall be permitted to exceed the maximum height.

R317.4 Wood/plastic composites. Wood/plastic composites used in exterior deck boards, stair treads, handrails and guard~~rail~~ systems shall bear a *label* indicating the required performance levels and demonstrating compliance with the provisions of ASTM D 7032.

R317.4.1 Labeling. Deck boards and stair treads shall bear a label that indicates compliance to ASTM D 7032 and includes the allowable load and maximum allowable span. Handrails and guard~~rail~~ systems or their packaging shall bear a label that indicates compliance to ASTM D 7032 and includes the maximum allowable span.

R507.3 Wood/plastic composites. Wood/plastic composites used in exterior deck boards, stair treads, handrails, and guard~~rail~~ systems shall bear a label indicating the required performance levels and demonstrating compliance with the provisions of ASTM D 7032.

Reason: There is no construction component recognized or required by the IRC called a “guardrail”. A “guard” is clearly defined by the IRC in chapter two and does not in anyway require the presence of a “rail”. In the decking industry, it is quite common to see guards constructed as outdoor kitchen counters, benches, planter boxes and numerous other architectural elements. Use of the term “guardrail” inappropriately implies that a “rail” must be present in guard assemblies, and has been known to unnecessarily restrict design freedom in the decking industry. Note that footnote “d”, associated with the term “guardrail” uses the correct term “guard” within its text. The use of appropriate, IRC-defined terms clarifies the intent of the provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

RB58-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R301.5T-RB-MATHEWSON

RB59 – 13
Table R301.5

Proponent: Dennis Pitts, American Wood Council, representing American Wood Council (dpitts@awc.org)

Revise as follows:

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

(Portions of table not shown remain unchanged.)

a *(No change to current text)*

b. Uninhabitable attics without storage are those where the maximum clear height between joists and rafters is less than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches high by 24 inches in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirements.

c through f *(No change to current text)*

g. Uninhabitable attics with limited storage are those where the maximum clear height between joists and rafters is 42 inches or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. The live load need only be applied to those portions of the joists or truss bottom chords where all of the following conditions are met:
   1. The attic area is accessible from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the attic is a minimum of 30 inches.
   2. The slopes of the joists or truss bottom chords are no greater than 2 inches vertical to 12 units horizontal.
   3. Required insulation depth is less than the joist or truss bottom chord member depth.

   The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed ~~concurrent~~ live load of not less than 10 lb/ft^2. <u>This live load need not be assumed to act concurrently with any other live load requirements.</u>

h *(No change to current text)*

Reason: In ASCE 7-10, uninhabited attics without storage are assigned a 10 psf live load for design of ceiling joists and truss bottom chords. This live load is intended to address occasional access of the space and wording in ASCE 7-10 footnote "l" does not require this live load to be applied concurrently with other live loads when designing the full roof assembly or supporting members such as headers and studs.

Similarly in ASCE 7-10, uninhabited attics with limited storage are also assigned a 10 psf live load in the portions of the attic above ceiling joists and truss bottom chords where significant storage is not possible. As with uninhabited attics without storage, ASCE 7-10 footnote "*m*" does not require the 10 psf live load to be applied concurrently with other live loads when designing the full roof assembly or supporting members such as headers and studs. However, the current wording in the IRC dropped the prefix "non" from "nonconcurrent" when these new provisions from ASCE 7-10 were incorporated. This change returns the wording to the ASCE 7-10 intent.

Cost Impact: No increase in cost of construction.

RB59-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R301.5T-RB-PITTS

RB60 – 13
Table R301.7

Proponent: Charles S. Bajnai, Chesterfield County, VA, ICC Building Code Action Committee and Virginia Building and Code Officials Association (bajnaic@chesterfield.gov)

Revise as follows:

TABLE R301.7
ALLOWABLE DEFLECTION OF STRUCTURAL MEMBERS [b,c]

STRUCTURAL MEMBER	ALLOWABLE DEFLECTION
Rafters having slopes greater than 3:12 with no finished ceiling attached to rafters	L/180
Interior walls and partitions	H/180
Floors~~/ceilings with plaster or stucco finish~~ (including deck floors)	L/360
Ceilings with brittle finishes (plaster, stucco, etc)	L/360
Ceilings with flexible finishes (gypsum board, etc)	L/240
All other structural members	L/240
Exterior walls—wind loads [a] with plaster or stucco finish	H/360
Exterior walls with other brittle finishes	H/240
Exterior walls with flexible finishes	H/120[d]
Lintels supporting masonry veneer walls [e]	L/600

Note: *L* = span length, *H* = span height.

a. The wind load shall be permitted to be taken as 0.7 times the Component and Cladding loads for the purpose of the determining deflection limits herein.
b For cantilever members, *L* shall be taken as twice the length of the cantilever.
c. For aluminum structural members or panels used in roofs or walls of sunroom additions or patio covers, not supporting edge of glass or sandwich panels, the total load deflection shall not exceed *L*/60. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed *L*/175 for each glass lite or *L*/60 for the entire length of the member, whichever is more stringent. For sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed *L*/120.
d. Deflection for exterior walls with interior gypsum board finish shall be limited to an allowable deflection of *H*/180.
e. Refer to Section R703.7.2.

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 6 open meetings and numerous workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

This code change was intended to clarify two issues.

1. There is confusion regarding the deflection allowed for deck joists. It was not clear if the original authors intended deck joists to be considered as a floor joist (L/360) or as “other structural members” (L/240). This clarifies the intention.
2. The other significant change addresses the flexibility/stiffness of gypsum board which is a lot more common than either plaster of stucco in most parts of the country. There is now cleaner differentiation between materials and is consistent with the allowable deflection limits in Table R802.4(1) and R802.4(2).

Cost Impact: None.

RB60-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R301.7T-RB-BAJNAI-BCAC

RB61 – 13
Table R301.7

Proponent: Cole Graveen PE, SE, Raths, Raths & Johnson, Inc., representing self (cwgraveen@rrj.com)

Revise as follows:

TABLE R301.7
ALLOWABLE DEFLECTION OF STRUCTURAL MEMBERS[b,c]

STRUCTURAL MEMBER	ALLOWABLE DEFLECTION
All other structural members	L/240
Guards[f,g] Post (horizontal deflection) Top Rail (horizontal deflection) Top Rail (vertical deflection)	 H/12 H/24 + L/96 L/96

(Portions of table not shown remain unchanged)

a through e *(No change to current text)*

f. For the guard post, H shall be taken as the distance from the top of the top rail to the first point of support.

g. For the guard top rail, H shall be taken as the height of the rail and L shall be taken as the distance between edges of the post supports. The deflection of the top rail is measured relative to the center of the two posts.

Reason: Specific deflection limits for guards are proposed to clarify serviceability requirements and to help ensure occupant safety and comfort.

The serviceability requirements for guards in the both the IBC and IRC are vague and open to interpretation. The IBC requires all structural systems and members to have adequate stiffness to limit deflections and lateral drift, Section 1604.3, however it contains no specific deflection limits for guards. The IRC contains a general deflection limit of L/240 in Table R301.7 for all structural members not otherwise listed in the table. However, it is not likely that this limit was originally intended to apply to guards nor does it appear that this limit is commonly applied to guards in design or code enforcement.

The deflection limits proposed in this code change are based upon existing requirements in ASTM E985, *Standard Specification for Permanent Metal Railing Systems and Rails for Buildings*, ASTM D7032, *Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails)*, and ICC-ES AC273, *Acceptance Criteria for Handrails and Guards*. The proposed limits allow reasonable deflection of the guard post and top rail while still ensuring that the guard will perform its intended function of preventing accidental falls. It is important to note that while excessive deflection is undesirable, some deflection is desirable[4] as it can provide warning to the occupant that they are at an edge of an elevated surface and may be unduly loading the guard.

Specific deflection limits are needed not only for clarity, but also to establish acceptable performance. Guards are provided to minimize the possibility of occupants accidentally falling from an elevated surface. The ability of a guard to prevent such an accidental fall depends on its stiffness as well as its height and strength. Guards that meet the strength and height requirements of the code but that move excessively under load could potentially not prevent an accidental fall. Limiting guard deflections to appropriate amounts will help protect occupants against accidentally falling from an elevated surface.

In addition, specific deflection limits are also necessary to help ensure that occupants are comfortable and feel safe. Similar to floor deflection limits that ensure that occupants are not uncomfortable or annoyed with bouncy floors or building drift limits that ensure that occupants are not uncomfortable or sick due to the swaying motion of tall buildings, reasonable lateral deflection limits for guards will help ensure that occupants do not feel that the guard is unsafe.

Example: Under the proposed deflection provisions, the post for a residential guard with a top rail height of 36" above the walking surface and a point of support 3" below the walking surface would have a deflection limit of (36 + 3)/12 = 3.25 inches. The top rail spanning between 4" wide posts that are spaced 4' apart would have a horizontal deflection limit of (48 – 4)/96 + (36 + 3)/24 = 2.10 inches.

References:

1. ASTM E985-00(2006), Standard Specification for Permanent Metal Railing Systems and Rails for Buildings
2. ASTM D7032-08, Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails)
3. ICC-ES AC273, Acceptance Criteria for Handrails and Guards, Corrected January 2009
4. Loferski, J., Albright, D., and Woeste, F. (July 2007) Tested Guardrail Post Connections for Residential Decks, Structure Magazine

Cost Impact: This code change proposal may increase the cost of construction by increasing the design costs. Designers may have to perform additional serviceability calculations.

RB61-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R301.7T-RB-GRAVEEN

RB110 – 13
R308.1, R308.1.1, R308.3, R308.4

Proponent: Rick Davidson, City of Maple Grove, Association of Minnesota Building Officials (rdavidson@maplegrovemn.gov)

Revise as follows:

R308.1 ~~Identification.~~ ~~Except as indicated in Section R308.1.1 each~~ **Required.** Every pane of glazing ~~installed in hazardous locations as defined in Section~~R308.4 shall meet the requirements of R308.3.1 and shall be provided with a manufacturer's designation specifying who applied the designation, designating the type of glass and the safety glazing standard with which it complies, which is visible in the final installation. The designation shall be acid etched, sandblasted, ceramic-fired, laser etched, embossed, or be of a type which once applied cannot be removed without being destroyed. ~~A *label* shall be permitted in lieu of the manufacturer's designation.~~

Exceptions:

1. ~~For other than tempered glass, manufacturer's designations are not required provided the *building official* approves the use of a certificate, affidavit or other evidence confirming compliance with this code.~~
2. ~~2.~~ Tempered spandrel glass is permitted to be identified by the manufacturer with a removable paper designation.

~~**R308.1.1 Identification of multiple assemblies.** Multipane assemblies having individual panes not exceeding 1 square foot (0.09 m^2) in exposed area shall have at least one pane in the assembly identified in accordance with Section R308.1. All other panes in the assembly shall be *labeled* "CPSC 16 CFR 1201" or "ANSI Z97.1" as appropriate.~~

R308.2 Louvered windows or jalousies. Regular, float, wired or patterned glass in jalousies and louvered windows shall be no thinner than nominal 3/16 inch (5 mm) and no longer than 48 inches (1219 mm). Exposed glass edges shall be smooth.

R308.2.1 Wired glass prohibited. Wired glass with wire exposed on longitudinal edges shall not be used in jalousies or louvered windows.

R308.3 Human impact loads. Individual glazed areas, including glass mirrors ~~in hazardous locations such as those indicated as defined in Section R308.4~~, shall pass the test requirements of Section R308.3.1.

Exceptions:

1. Louvered windows and jalousies shall comply with Section R308.2.
2. Mirrors and other glass panels mounted or hung on a surface that provides a continuous backing support.
3. Glass unit masonry complying with Section R610.

R308.3.1 Impact test. Where required by other sections of the code, glazing shall be tested in accordance with CPSC 16 CFR 1201. Glazing shall comply with the test criteria for Category I or II as indicated in Table R308.3.1(1).

Exception: Glazing not in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers shall be permitted to be tested in accordance with ANSI Z97.1. Glazing shall comply with the test criteria for Class A or B as indicated in Table R308.3.1 (2).

R308.4 Hazardous locations. The locations specified in Sections R308.4.1 through R308.4.7 shall be considered specific hazardous locations for the purposes of glazing.

R308.4.1 Glazing in doors. Glazing in all fixed and operable panels of swinging, sliding and bifold doors shall be considered a hazardous location.

Exceptions:

1. Glazed openings of a size through which a 3-inch-diameter (76 mm) sphere is unable to pass.
2. Decorative glazing.

R308.4.2 Glazing adjacent doors. Glazing in an individual fixed or operable panel adjacent to a door where the nearest vertical edge of the glazing is within a 24-inch (610 mm) arc of either vertical edge of the door in a closed position and where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the floor or walking surface shall be considered a hazardous location.

Exceptions:

1. Decorative glazing.
2. When there is an intervening wall or other permanent barrier between the door and the glazing.
3. Glazing in walls on the latch side of and perpendicular to the plane of the door in a closed position.
4. Where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth. Glazing in this application shall comply with section R308.4.3.
5. Glazing that is adjacent to the fixed panel of patio doors.

R308.4.3 Glazing in windows. Glazing in an individual fixed or operable panel that meets all of the following conditions shall be considered a hazardous location:

1. The exposed area of an individual pane is larger than 9 square feet (0.836 m^2);
2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor;
3. The top edge of the glazing is more than 36 inches (914 mm) above the floor; and
4. One or more walking surfaces are within 36 inches (914 mm), measured horizontally and in a straight line, of the glazing.

Exceptions:

1. Decorative glazing.
2. When a horizontal rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of $1^1/_2$ inches (38 mm) in cross sectional height.
3. Outboard panes in insulating glass units and other multiple glazed panels when the bottom edge of the glass is 25 feet (7620 mm) or more above *grade*, a roof, walking surfaces or other horizontal [within 45 degrees (0.79 rad) of horizontal] surface adjacent to the glass exterior.

R308.4.4 Glazing in guards and railings. Glazing in guards and railings, including structural baluster panels and nonstructural in-fill panels, regardless of area or height above a walking surface shall be considered a hazardous location.

R308.4.5 Glazing and wet surfaces. Glazing in walls, enclosures or fences containing or facing hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers and indoor or outdoor swimming pools where

~~the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface shall be considered a hazardous location. This shall apply to single glazing and all panes in multiple glazing.~~

> ~~**Exception:** Glazing that is more than 60 inches (1524 mm), measured horizontally and in a straight line, from the water's edge of a bathtub, hot tub, spa, whirlpool, or swimming pool.~~

~~**R308.4.6 Glazing adjacent stairs and ramps.** Glazing where the bottom exposed edge of the glazing is less than 36 inches (914 mm) above the plane of the adjacent walking surface of stairways, landings between flights of stairs and ramps shall be considered a hazardous location.~~

> ~~**Exceptions:**~~
>
> 1. ~~When a rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of $1^1/_2$ inches (38 mm) in cross sectional height.~~
> 2. ~~Glazing 36 inches (914 mm) or more measured horizontally from the walking surface.~~

~~**R308.4.7 Glazing adjacent to the bottom stair landing.** Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than 36 inches (914 mm) above the landing and within 60 inches (1524 mm) horizontally of the bottom tread shall be considered a hazardous location.~~

> ~~**Exception:** The glazing is protected by a guard complying with Section R312 and the plane of the glass is more than 18 inches (457 mm) from the guard.~~

Reason: We have all heard the warnings from the media and the National Weather Service during certain weather events asking people to take shelter and "stay away from windows". Why? Windows are the weak link in protection from flying debris and hail. Windows allow debris to enter homes. Windows can be a danger in certain weather conditions and from certain common everyday events. Occupants are put at risk from this flying debris or from flying glass. Flying shards of glass can become deadly missiles. Homes with shattered windows are more susceptible to interior damage and greater wind damage increasing repair costs and insurance premiums.

Tempered glass is 4-5 times stronger than non-tempered glass. Using tempered glass or other safety glazing products will increase the safety of homes during certain weather events by reducing the amount of flying debris entering the home, reducing flying glass, and adding greater protection against the elements for the home.

But weather events aren't the only reason to require all glazing to be safety glazing. In earthquake prone areas, shattered glass is a reality and a safety hazard.

And, normal activities in the home can quickly turn tragic and involve serious injury. In the last code cycle, Thomas S. Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee stated during the ICC hearings: "The assumption that people are familiar with their home environment does not take into consideration guests, rental units, or accidental impacts, for example, resulting from horseplay, that can result in human impact with glazing …" Children playing in or about the home can come into contact with glazing that is not now required to be safety glazed resulting in serious injuries. Children and adults can accidentally fall into window wells contacting the glass in a downward fall. News reports periodically highlight these events such as the Oklahoma lady who was cut by flying glass when a neighbor child's baseball hit her window or of the children in Ohio that were cut by flying glass when a tree fell against their home in a storm.

Because of its added strength, safety glazing creates more of a barrier to intruders which in turn increases the personal safety level in the home.

There are significant benefits to be had by requiring all glass in a home to be safety glazed. They can reduce injuries and related health care costs and because of the increased strength, may help to reduce break-ins.

The rules themselves as they are currently written are full of arbitrary limitations. Consider this: A window that is at floor level and that is 8.9 square feet need not be safety glazed while a window that is .1 sq feet larger and 17 inches off the floor must be safety glazed. Children are just as likely to run into and be harmed regardless the size. Flying shards of glass are dangerous no matter what size window they come out of or no matter how high off the floor they fall from. Windows can be struck by flying debris at any height. The higher the glass is off the floor, the more dangerous it is when it falls.

Entire industries have popped up that provide various films for placement over windows to make the glass safer from the standpoint of intrusion, damage from weather, and other safety glazing reasons. Why not just require safety glazing to begin with. Tempered glass is even more resistant to breakage from fire in an adjoining building.

It is amazing that with all of the news articles written about the dangers of glass that industry hasn't taken on the responsibility of installing safety glazing in all of their products. The technology is there. The cost is minimal compared to the many code changes that have been approved in recent years to prevent incidents that by any means would be rare; the underfloor fire protection to protect fire fighters comes immediately to mind. Accidents related to breaking glass could occur at any time in any

dwelling with any occupant. And unlike a fire, are more likely to involve entire communities. It is time to make homes safer for the occupants.

Cost Impact: This proposal will increase the cost of construction.

RB110-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R308.1-RB-DAVIDSON

RB114 – 13
R308.4.6, R308.4.7

Proponent: Tim Pate, City and County of Broomfield, CO representing Colorado Chapter Code Change Committee

Revise as follows:

R308.4.6 Glazing adjacent to stairs and ramps. Glazing where the bottom exposed edge of the glazing is less than ~~36 inches (914 mm)~~ 60 inches (1524 mm) above the plane of the adjacent walking surface of stairways, landings between flights of stairs and ramps shall be considered a hazardous location.

Exceptions:

1. When a rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above walking surface. The rail shall be capable of capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of 1 ½ inches (38 mm) in cross sectional height and the plane of glass is more than 18 inches (457 mm) horizontally from the rail.
2. Glazing 36 inches (914 mm) or more measured horizontally from the walking surface.

R308.4.7 Glazing adjacent to the bottom stair landing. Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than ~~36 inches (914 mm)~~ 60 inches (1524 mm) above the landing and within 60 inches (1524 mm) horizontally of the bottom tread shall be considered a hazardous location.

Exception: The glazing is protected by a guard complying with Section 312 and the plane of the glass is more than 18 inches (457 mm) from the guard.

Reason: All of the previous editions of the IRC required glazing that was had bottom edge below 60 inches above the plane of walking surfaces of stairways, landings between flights of stairs and ramps, and adjacent to stair landings to be approved safety glazing. Code change was approved which changed the 36 inches back to 60 inches. There was a comprehensive code change (S218 09/10) that reformatted the entire safety glazing section and also changed the dimension from 60 inches down to 36 inches. This was approved and overrode my code change.

My reason statement for the code change during the 2009/2010 cycle was very clear in helping clean up the inconsistencies in the earlier codes. As you can see it specifically required the wall with glazing to be at least 18 inches away. The reason statement that the IRC change committee gave in approving the comprehensive change was that it should be lowered to 36" which would match the exception. I could never find a good reason as to why my code change that was approved by the IRC committee did not stand and get incorporated into the overall change also approved by the IRC code change committee.

I am copying my code change (RB40-09/10) and reason statement that the2009/2010 IRC committee agreed with:

Revise as follows:

R308.4 The following shall be considered specific hazardous locations for the purposes of glazing:

Items 1 through 6 remain unchanged

7. Glazing adjacent to stairways, landings, and ramps within 36 inches (914 m) horizontally of a walking surface when the exposed surface of the glazing is less than 60 inches (1524 mm) above the plane of the adjacent walking surface.

   Exceptions:

   1. ~~When a rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per lineal foot (730 N/m) without contacting the glass and be a minimum of 1 ½ inches (38 mm) in cross sectional height.~~
   2. The side of the stairway has a guard~~rail~~ or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glazing is more than 18 inches (457 mm) from the railing; or
   3. When a solid wall or panel extends from the plane of adjacent walking surface to 34 inches (863 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a guard and the plane of the glazing is more than 18 inches (457 mm) from the wall or panel.

8. Glazing adjacent to stairways within 60 inches (1524 m) horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glazing is less than 60 inches (1524 mm) above he nose of the tread.

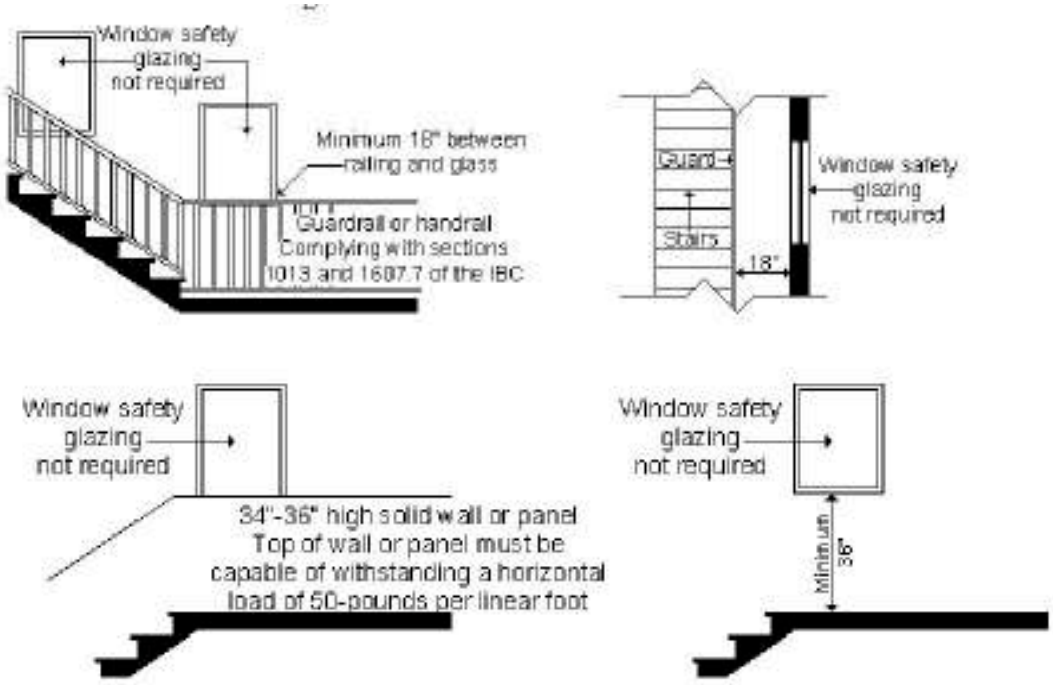
Exceptions:

1. The side of the stairway has a guard~~rail~~ or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glazing is more than 18 inches (457 mm) from the railing; or
2. When a solid wall or panel extends from the plane of adjacent walking surface to 34 inches (863 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a guard and the plane of the glazing is more than 18 inches (457 mm) from the wall or panel.

Reason: Code change RB15-00 added exception 9 (9.1 and 9.2) which allowed the protective bar but also required the glazing to be at least 18" away from the stair and bar. Code change RB16-00 was also approved in the same code change cycle which added the reference in exception #5 which would allow the protective bar but not require the 18" separation. This created a direct conflict between the two exceptions in the 2003 IRC and the 2006 IRC. IRC Section R308.4 was modified for the 2009 IRC by reformatting the requirements and exceptions in order to make it more user friendly but no technical changes were made.

Stairs are inherently more dangerous for tripping hazards than normal walking surfaces. It does not make sense to a allow 1 ½" wide bar or a solid wall directly adjacent to stairs and landings and think this gives adequate protection for someone falling into glazing that is not safety glazing. Requiring the glazing to be at least 18" away would provide better protection if someone trips and falls which is exactly what 2009 IRC section R308.4 #7 Exception 2 requires.

The following diagrams illustrates what R308.4 #7 exception 2 allows which is the guard or handrail but also the 18" separation which is in conflict with what is allowed in #7 exception 1 or 3 which allows a rail or solid wall but does not require the 18" separation.



I was also successful in having the IBC safety glazing section changed back to 60 inches during the past Code Change Hearing in Dallas for the 2015 IBC. Here is the code change (S297-12) to IBC along with the reason statement – this code change was approved by Structural Code Change Committee and was not challenged at Final Action Hearings and therefore was approved on the consent agenda:

Revise as follows:

2406.4.7 Glazing adjacent to the bottom stair landing. Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than ~~36 inches (914 mm)~~ 60 inches (1524 mm) above the landing and within a 60 inches(1524 mm) horizontally of the bottom tread shall be considered a hazardous location.

Reason: Previous editions of the IBC before the 2012 required glazing that is less than 60" above the landing to be approved safety glazing. It is not clear why this requirement was changed in the 2012. It does not make sense that section 2406.4.6 applies to glazing that is less than 60" above the stairs and intermediate landings but the glazing at bottom landing is treated differently – only when below 36" The potential for falling through the glazing at bottom landing is the same. This change will bring back the 60" height which will then match the requirement at intermediate landings and stairs.

Both 2012 IBC sections 2406.4.6 and 2406.4.7 have exceptions which allow a guard but require the plane of glass to be at least 18" away from the guard.

This code change should be approved in order to make sure that people who use stairs, ramps, and landings remain safe in case they trip and fall and potentially fall through windows adjacent to the stairs and ramps. I do not feel that only protecting glazing that is below 36" above walking surface is adequate but that all glazing below 60" should be protected. The vast majority of people will have their hands and arms outstretched if falling at 48" or so high and would be falling through glass at this height or somewhat higher. Approving this code change will get both the IRC and IBC to match which is extremely important.

Cost Impact: Cost Impact: This code change will increase the cost of construction.

RB114-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R308.4.6-RB-PATE

RB115 – 13
R308.4.7

Proponent: Tim Pate, City and County of Broomfield, CO representing Colorado Chapter Code Change Committee

Revise as follows:

R308.4.7 Glazing adjacent to the bottom stair landing. Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than 36 inches (914 mm above the landing and within a 60 inch~~es~~ (1524 mm) ~~horizontally of~~ horizontal arc less than 180 degrees from the bottom tread nosing shall be considered a hazardous location.

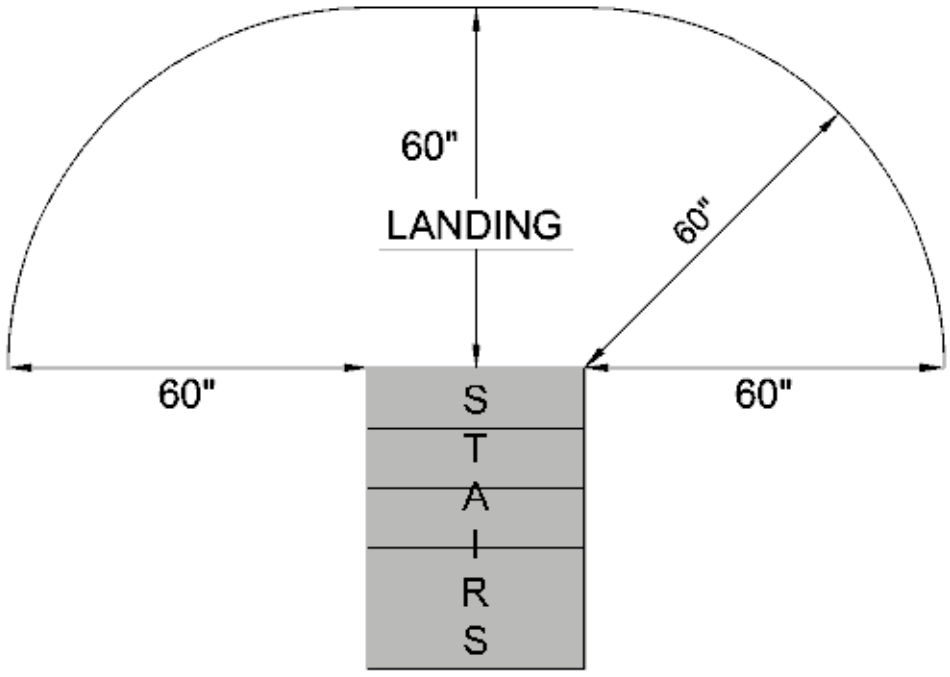
> **Exception:** The glazing is protected by a guard complying with Section 312 and the plane of the glass is more than 18 inches (457 mm) from the guard.

Reason: Previous editions of the IRC before the 2012 required glazing that is 60" horizontally in any direction to be approved safety glazing. It is not clear why this requirement was changed in the 2012. The previous editions had the additional wording "in any direction" when applying the 60" horizontal rule. This is due to the "splay" factor for when someone gets to the last tread and falls. The tendency is for someone to flail out in any direction.

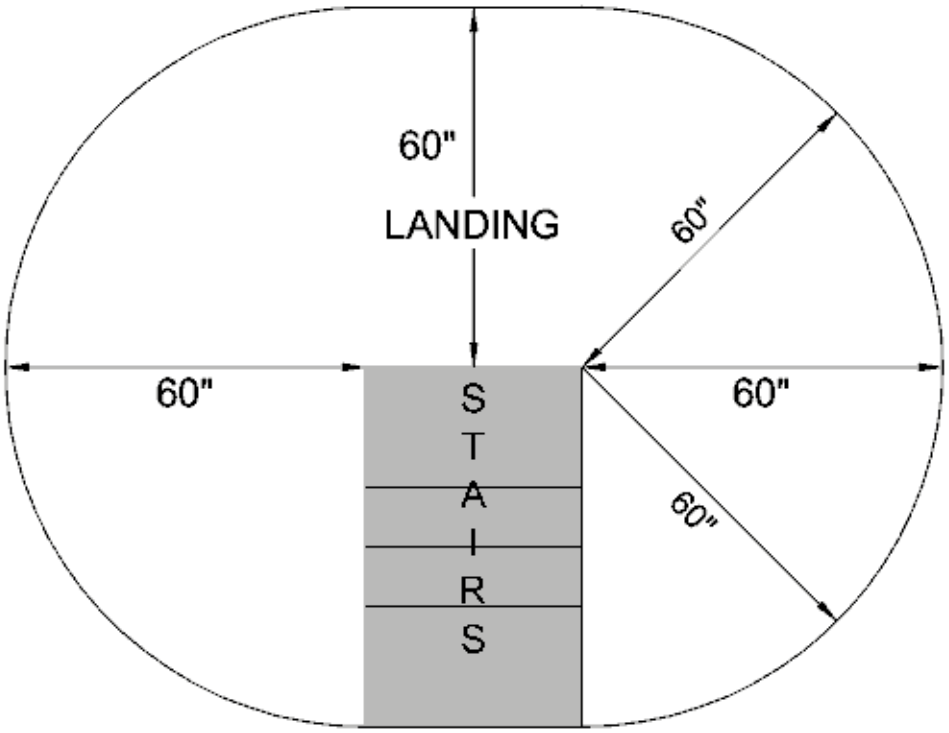
This added wording will make this section only apply to any glazing that is in a wall that is less than 180 degrees from the bottom tread nosing. I believe that adding the wording which would limit the area needing safety glazing to any glazing that falls within a 180 degree arc from bottom tread nosing and extending out 60" makes more sense since it is extremely unlikely that someone will fall out and backwards. I have added an illustration which should help everyone see what this changed wording will do.

Please note that there is still a requirement to provide approved safety glazing when located within 36" horizontally of the sides of the stairs.

The new code language will incorporate the areas shown in the following diagram:



The current code language incorporates the area shown below in the diagram:



This same code change proposal was reviewed and approved at the Final Action Hearings for the 2015 IBC – therefore this proposal for the IRC will get the two code sections to match which is important for consistency.

Cost Impact: This code change will reduce construction cost.

RB115-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R308.4.7-RB-PATE

old is 37 inches. It doesn't take a rocket scientist to see that children of these ages and these heights and lower window sill are a recipe for disaster and that is exactly what is happening.

There are numerous solutions available that would allow windows with to extend all the way to the floor if the designer wishes. And if the membership agrees to eliminate the need for emergency escape windows in sprinklered homes, that eliminates another concern.

Numerous requirements without substantiated need have been placed in the code in recent years that, at best, will provide limited benefit to a very small handful of individuals. Here we have an opportunity to provide increased levels of safety for children. This should be the proverbial "no-brainer".

Cost Impact: None

RB147-13

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R312.2.1-RB-DAVIDSON

RB148 – 13
R313.1 (New), R313.1.1, R313.2, R313.2.1, R313.4 (New), R302.2

Proponent: Matt Archer, Douglas County, CO, representing self (marcher@douglas.co.us)

Revise as follows:

R313.1 General. The design, installation, inspection, maintenance, repair and replacement of residential automatic fire sprinkler systems and components shall comply with the manufacturer's instructions and Section P2904.

R313.1 2 Townhouse ~~automatic fire sprinkler systems~~. An automatic residential fire sprinkler system shall be installed in *townhouses*.

Exception: ~~An automatic residential fire sprinkler system shall not be required when *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed.~~ Townhouses separated by a fire rated wall assembly totaling 2 hours in accordance with Section R302.2 and fire protected floors complying with Section R501.3 shall not be required to have an automatic residential fire sprinkler system.

~~**R313.1.1 Design and installation.** Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with Section P2904.~~

~~**R313.2**~~ **R313.3 One- and two-family dwellings ~~automatic fire systems.~~** An automatic residential fire sprinkler system shall be installed in one- and two-family *dwellings*.

Exception: One- and two-family dwellings complying with the exterior wall construction of Table 302.1(1) and fire protected floors complying with Section R501.3 shall not be required to have an automatic residential fire sprinkler system.

~~**Exception:**~~ **R313.4 Additions and alterations.** An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system.

~~**R313.2.1 Design and installation.** Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.~~

R302.2 Townhouses. Each *townhouse* shall be considered a separate building and shall be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302.1 for exterior walls.

~~**Exception**~~ **Exceptions:**

1. Townhouses with an automatic residential fire sprinkler system are permitted to have a common 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263. ~~is permitted for townhouses if such walls do~~ The common wall shall not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Chapters 34 through 43. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.
2. A common 2 hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 is permitted for townhouses where such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall.

RB125 – 13
R311.1

Proponent: Paul Armstrong, PE, CBO; Orange Empire Chapter – Code Committee; Orange Empire Chapter

Revise as follows:

R311.1 Means of egress. All dwellings shall be provided with a means of egress as provided in this section. The means of egress shall provide a continuous and unobstructed path of vertical and horizontal egress travel from all portions of the dwelling to the ~~exterior of the dwelling at the~~ required egress door without requiring travel through a garage. The required egress door shall open to a yard or court that leads to a public way.

Reason: The purpose of this change is to clarify the means of egress from dwellings under the IRC. The proposal attempts to split the egress path into two simpler sentences. The original sentence has been revised to address interior path of egress travel up to the required egress door. The new sentence addresses the exterior area from the required egress door and also clarifies that the required egress door opens to a yard or court that leads to a public way. The new text is consistent with the requirement for emergency escape and rescue openings in Section R310.1.

Cost Impact: The code change proposal will not increase the cost of construction.

RB125-13

Public Hearing: Committee:	AS	AM	D
Assembly:	ASF	AMF	DF

R311.1-RB-ARMSTRONG

RB126 – 13
R311.3.2

Proponent: Wesley Walters, Clark County Nevada Development Services, representing self

Revise as follows:

R311.3.2 Floor elevations for other exterior doors. Doors other than the required egress door shall be provided with landings or floors not more than 7 ¾ inches (196 mm) below the top of the threshold.

Exception: A top landing is not required where a stairway of two or fewer risers is located on the exterior side of the door, provided the door does not swing over the stairway.

Reason: The code does not define which landing is not required, this will clarify that it is only the top one being eliminated.

Cost Impact: The code change proposal will not increase the cost of construction.

RB126-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.3.2-RB-WALTERS

RB127 – 13
R311.4

Proponent: Homer Maiel, PE, CBO, 4LEAF, Inc., representing self

Revise as follows:

R311.4 Vertical egress. Egress from habitable levels including habitable attics and basements not provided with an egress door in accordance with Section R311.2 shall be by ~~a~~ one or more ramps in accordance with Section R311.8 or ~~a~~ one or more stairways in accordance with Section R311.7 or both. For habitable levels or basements located more than one story above or more than one story below an egress door, the maximum travel distance from any occupied point to a stairway or ramp that provides egress from such habitable level or basement, shall not exceed 50 feet (15 240 mm).

Reason: In the legacy codes, one exit from the third floor within an individual dwelling unit or a Group R, Division 3 congregate residence was allowed as long as the third story area did not exceed 500 square feet. Currently, IRC has no limitations on the stories above the second floor. This addition that limits the travel distance on the floors above the second floor to 50 feet or less addresses that concern. Same applies when there are more than one level of basement below the first floor.

Cost Impact: The code change proposal will not increase the cost of construction.

RB177-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.4-RB-MAIEL

RB128 – 13
R311. 6

Proponent: Rick Davidson, City of Maple Grove, Association of Minnesota Building Officials (rdavidson@maplegrovemn.gov)

Revise as follows:

R311.6 Hallways. The minimum width of a hallway shall be not less than ~~3 feet (914 mm)~~ 32 inches (812 mm).

Reason: The International Residential Code Commentary states the following in regards to hallways:

> **R311.3 Hallways.** The minimum width of a hallway shall be not less than 3 feet (914 mm).
>
> ❖ Hallways must be a minimum of 3 feet (914 mm) wide to accommodate moving furniture into rooms off the hallway and for safe egress from the structure.

So the hallway width is necessary to accommodate moving furniture and for safe egress. Why should the code be concerned about moving furniture? In fact the scoping and purpose of the code say nothing about moving furniture. And if the concern was genuine, hallways would need to be wider given the size of some furniture. Clearly, the width of a hallway is an arbitrary dimension not based on safety but likely based on convenience.

Regarding safe egress, if this were truly a concern about safe egress, why wouldn't we specify the minimum door sizes from bedrooms, bathrooms, and other occupied spaces? As it is, the only thing we have to hang out hats on is the 20 inch minimum openable width of an emergency escape and rescue opening.

This is one of those code requirements that people seem to think is necessary but when push comes to shove, it doesn't get enforced.

For example, a plan review is done on a new home and the hallway is noted to be 36 inches wide. The framer then either frames the hallway at 36 inches or works from the exterior walls in to frame the various rooms. In either case, the potential exists that the hallway may be something less than 36 inches. This isn't something that many field inspectors will check at the framing inspection. Then during the final inspection the hall is determined to be 35 inches wide. What do you do? You ignore it of course. The cost to correct it is much too high given the benefit.

In another example, we have a home built with an unfinished basement. There is a center bearing wall with the furnace located a short distance from the wall. The mechanical contractor does not check the distance from the furnace to the bearing wall when installing the furnace. The basement is unfinished so the field inspector doesn't anticipate future finishing problems. Then, when the homeowner finishes the basement, the location of the furnace results in a hallway that is only 32 inches wide. They can't move the bearing wall. The cost to move the furnace and alter the ductwork, gas piping, and wiring is expensive. And what is to be gained? If the building department denies the permit, the basement will be finished at some point without permits. Do we want to encourage this?

These circumstances do occur. They are dealt with by building departments all the time. It is necessary to provide a better and more reasonable solution for this problem.

Furthermore, this will be regulated by the market place in new construction. If a homeowner views a new home for sale and they wish the hallway to be wider, they can make the decision to buy or not to buy.

The basic stair width requirement is 36 inches. But that can be reduced by 4.5 inches on each side for handrails. And the code only requires that the width of stairways below the handrails be 27 inches. Spiral stairways are permitted to be 26 inches.

R311.7 Stairways.

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 4.5 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 R311.7.9.1.

R311.7.10.1 Spiral stairways. Spiral stairways are permitted, provided the minimum clear width at and below the handrail shall be ***26 inches*** (660 mm) with each tread having a 71/2-inch (190 mm) minimum tread depth at 12 inches (914 mm) from the narrower edge. All treads shall be identical, and the rise shall be no more than 91/2 inches (241 mm). A minimum headroom of 6 feet 6 inches (1982 mm) shall be provided.

The only required egress door, need only provide 32 inches of clear width. A 36 inch wide hallway seems to be an anomaly.

R311.2 Egress door. 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).

This proposal reduces the required hallway width to 32 inches consistent with the main egress door and wider than what is required for stairs. If 27 inches is safe for egress in a stair and if I can move furniture up and down a stair that is 27 inches wide, I should be able to do the same in a hall.

Cost Impact: None

RB128-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.6-RB-DAVIDSON

RB129 – 13
R311.7

Proponent: Rick Davidson, City of Maple Grove, Association of Minnesota Building Officials (rdavidson@maplegrovemn.gov)

Add new text as follows:

R311.7 Stairways. Stairways serving a dwelling or accessory structure shall comply with this section. This shall include, but shall not be limited to, exterior stairs from a dwelling or garage to grade and those stairs serving decks, porches, balconies, sun rooms, and similar structures.

Exceptions:

1. Stairs serving attics or crawl spaces.
2. Stairs that only provide access to plumbing, mechanical, or electrical equipment.
3. Stairs that serve structures or spaces used by children as play areas.

Reason: When reading Section R311 of the IRC regarding stairs, the language supports only two interpretations on how stairs are regulated. Those two interpretations are that either all stairs must comply with the section or only those stairs that are a part of the means of egress should comply. There is no other language that allows vacillation between those interpretations.

The title of the section is "Means of Egress". R311.1 requires a means of egress from "all portions of the dwelling to the exterior of the dwelling…" R311.4 qualifies the charging language by stating that every habitable level including basements must either have an exterior exit door meeting the requirements of R311.2 or have a stair or ramp connecting that level to a level that has such a door. Note that it does not say "stairs" or "ramps" but "stair" or "ramp" (singular).

The text of the code does not support regulating stairs that are not a part of the "means of egress". This theory is apparently wide spread because many building officials are of the opinion that stairs used in landscaping are not regulated. Also, attempts to submit code changes to the ICC IRC Committee to give relief for stairs to attics and crawl spaces have been met with resistance from the Committee with the statement that they are already exempt. One can come to that conclusion only if you interpret the stair rules to apply to the means of egress and only one means of egress is required and that is only required from the dwelling, not attics, crawl spaces, and garages.

But if you take the position that the section only regulates those stairs that are part of the means of egress, stairways serving attics and crawl space and landscaping stairs would not be regulated but also stairs serving decks and the stairs commonly found serving as a path of travel from a dwelling to a garage would not be. In fact, R311.1 specifically prohibits a means of egress from traveling through a garage.

So there is confusion as to whether or not the code does regulate or intends to regulate certain stairs. This proposal makes it clear that all stairs are required to comply with the code unless specifically exempted. If this proposal is supported, stairs that are part of landscaping would be exempt unless they serve as a means of travel from a dwelling or accessory structure to grade. Stairs from a deck or from one level of a deck to another would be regulated. Stairs between a dwelling and garage would be regulated. Stairs serving an attic or crawl space would not be regulated. The current text already exempts stairs to crawl spaces by Section R311.4 but not directly. It exempts them because it does not list crawl spaces as a location where compliant stairs are required. But this also supports the possibility that the code does not regulate stairs serving a deck.

It is necessary to eliminate the confusion and inconsistency that exists in the enforcement of stair requirements that this language be approved. The proposal is reasonable because it puts into written format what is commonly accepted to be code language even if it cannot be supported by that text.

The following is for informational purposes only.

SECTION R311
MEANS OF EGRESS

R311.1 Means of egress. All *dwellings* shall be provided with a means of egress as provided in this section. The means of egress shall provide a continuous and unobstructed path of vertical and horizontal egress travel from all portions of the *dwelling* to the exterior of the *dwelling* at the required egress door without requiring travel through a garage.

And,

R311.4 Vertical egress. Egress from habitable levels including habitable attics and *basements* not provided with an egress door in accordance with Section R311.2 shall be by a ramp in accordance with Section R311.8 or a stairway in accordance with Section R311.7.

Cost Impact: None

RB129-13

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.7-RB-DAVIDSON

RB130 – 13
R311.7.1

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

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 ~~4.5~~ 6.5 inches (~~114~~165 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 31½ 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.

Reason: The required continuous handrail often needs to project an additional 2 inches from the side of the stairway to maintain the required finger clearance when passing nosing projections at a floor, landing, or return flight. This would not diminish the required width and would provide needed finger clearance to avoid nosing projections into the stairway.

Cost Impact: This code change will not increase the cost of construction

RB130-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311,7.1-RB-COOPER

RB131 – 13
R311.7.2, R311.7.5.1, R311.7.5.2.1.

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

R311.7.2 Headroom. The minimum headroom in all parts of the stairway shall not be less than 6 feet 8 inches (2032 mm) measured vertically from the sloped line adjoining the tread nosing or from the floor surface of the landing or platform on that portion of the stairway.

~~**Exception:**~~ **Exceptions:**

1. Where the nosings of treads at the side of a flight extend under the edge of a floor opening through which the stair passes, the floor opening shall be allowed to project horizontally into the required headroom a maximum of 4¾ inches (121 mm).
2. The headroom for spiral stairways shall be in accordance with Section R311.7.10.1

R311.7.5.1 Risers. The maximum riser height shall be 73/4 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). Risers shall be vertical or sloped from the underside of the nosing of the tread above at an angle not more than 30 degrees (0.51 rad) from the vertical. Open risers are permitted provided that the opening between treads does not permit the passage of a 4-inch-diameter (102 mm) sphere.

~~**Exception:**~~ **Exceptions:**

1. The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.
2. The opening between adjacent treads is not limited on spiral stairways.
3. The riser height of spiral stairways shall be in accordance with Section R311.7.10.1

R311.7.5.2.1 Winder treads. Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walkline shall not exceed the smallest winder tread by more than 3/8 inch (9.5 mm). Consistently shaped winders at the walkline shall be allowed within the same flight of stairs as rectangular treads and do not have to be within 3/8 inch (9.5 mm) of the rectangular tread depth.

Exception: The tread depth of spiral stair stairways shall be in accordance with Section R311.7.10.1

Reason: Exception 2 **Headroom** - The user of the code is currently only directed to R311.7.10.1 Spiral Stairways under R311.7.1 Width. Specific cross reference is needed under Headroom.

Exception 1 **Risers** – No change except numbering

Exception 2 **Risers** - Conformance with the IBC allowing open risers on spiral stairways.

Exception 3 **Risers** and new exception to **Winder treads** - The user of the code is currently only directed to R311.7.10.1 Spiral Stairways under R311.7.1 Width. Specific cross reference is needed under risers and winder treads.

Cost Impact: This code change will not increase the cost of construction

RB131-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.7.2-RB-COOPER

RB132– 13
R311.7.3

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

R311.7.3 Vertical rise. A *flight* of *stairs* shall not have a vertical rise greater than ~~12 feet (3658 mm)~~ 147 inches (3734 mm) between floor levels or landings.

Reason: The elevation of 147 inches is a multiple of the maximum riser height of 7-3/4 inches (197 mm). (See Table 1) This minor change of just 3 inches (76 mm) in the total rise of the flight would in many cases eliminate the cost of incorporating a landing and the space required, reducing construction costs. As can be seen in the table below this change would require no additional steps in the stair than the current code requires and a change in riser height of just 5/32 inch (4 mm) or less when the minimum number of risers is desired. This represents no discernable difference consequential to the user.

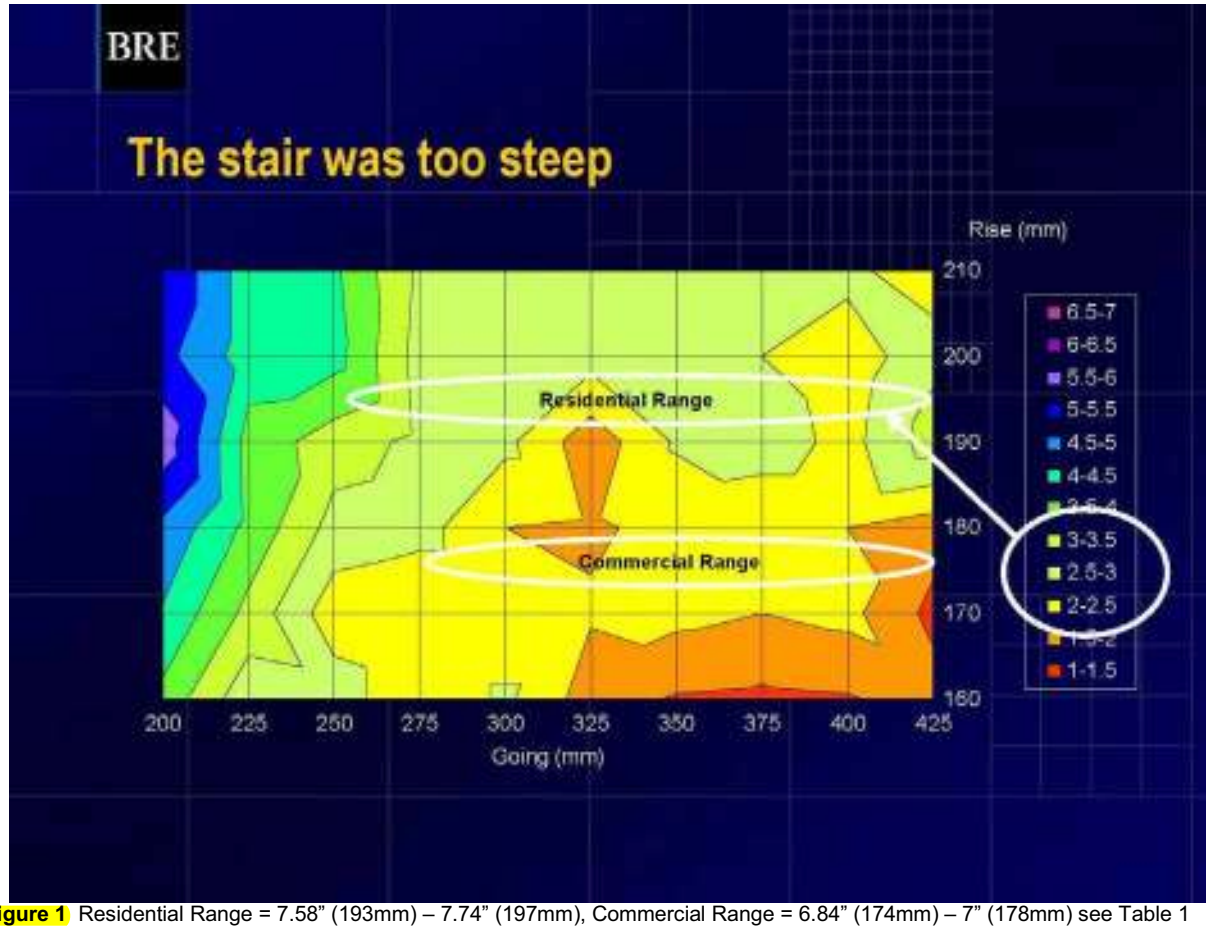


Figure 1 Residential Range = 7.58" (193mm) – 7.74" (197mm), Commercial Range = 6.84" (174mm) – 7" (178mm) see Table 1
Please note that the described circled ranges have been added to figures 1&2 by the proponent for the purpose of explanation.

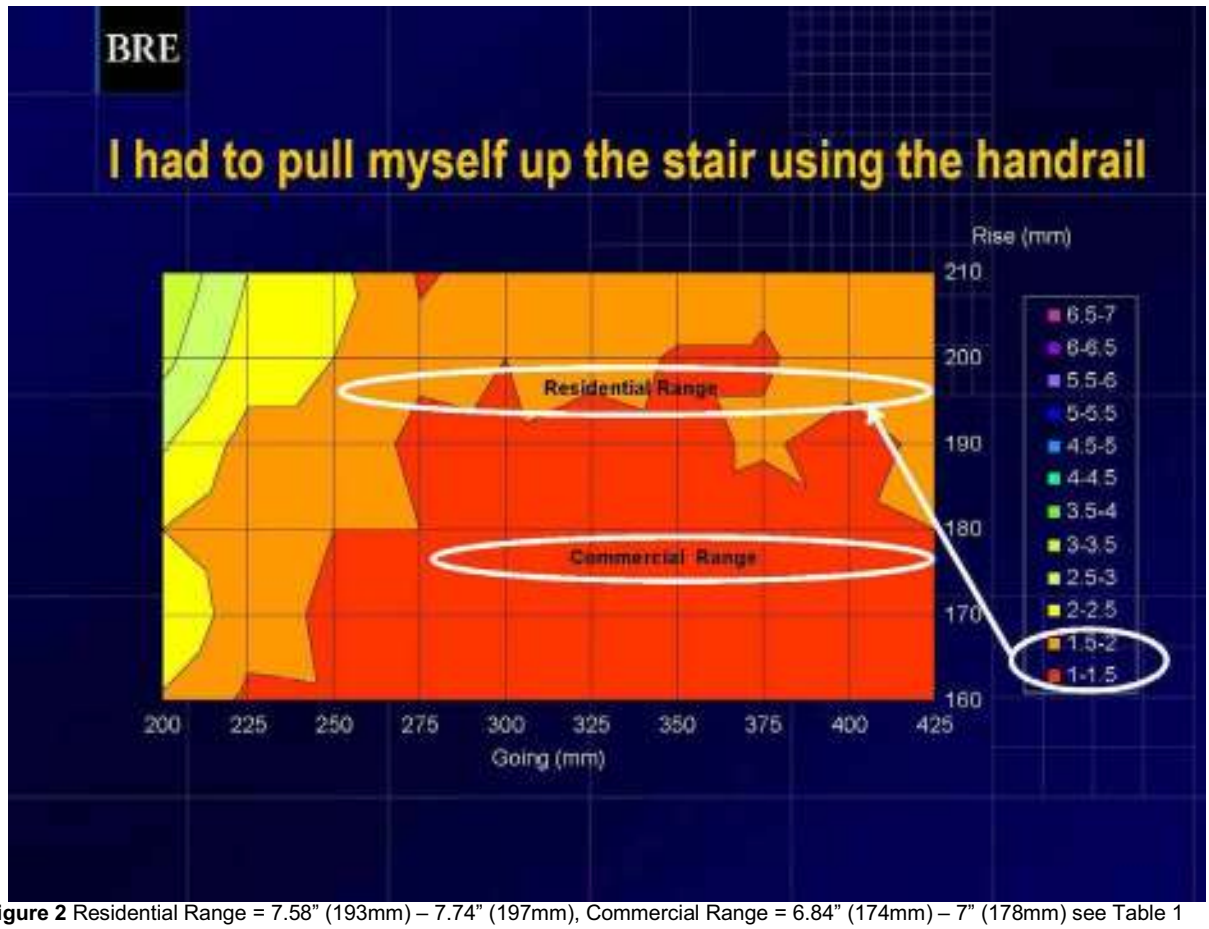


Figure 2 Residential Range = 7.58" (193mm) – 7.74" (197mm), Commercial Range = 6.84" (174mm) – 7" (178mm) see Table 1
Please note that the described circled ranges have been added to figures 1&2 by the proponent for the purpose of explanation.

	Vertical Rise	# Risers	Riser Height Inches	Change in Riser Height inches	Riser Height mm	Change in Riser Height mm
Most Occupancies	144	21	6.86		174	
	147	21	7.00	0.14	178	4
Dwelling Units	144	19	7.58		193	
	147	19	7.74	0.16	197	4

Table 1

Testing in support of this proposal, as shown in the data presentations (Figure 1 and 2) from; "The Influence of Rise and Going Combinations on Stair Safety" by M S Roys, June 2004, 7th World Conference on Injury Prevention and Safety Promotion, Vienna[1], the minor variation in rise does not produce any consequential effect that can be noticed by users when comparing riser heights within the range in question. *Please note that the circled ranges have been added to figure 1 & 2 by the proponent for the purpose of explanation.* Figures one and two can be related to the perceived energy required in ascent as described by the subjective rating of the steepness of the stair and the need to pull oneself up the stair using the handrail. In these figures the user's ratings are on a scale of 1-7 and color coded. The visual display of the data shows little difference in the users ratings over the range in question.

Additional testing data from this same study further illustrates little difference in the user's perception of riser height. When asked to rate descent of the stairway in response to the statement "I felt safe when walking down the stair" the risers heights of 6.69 inches, 7.09 inches, 7.48 inches (170 mm, 180 mm, 190 mm) all were rated the same with a tread depth of 10.83 inches (275 mm). Compared with the same tread depth the riser heights of 7.87 inches, 6.30 inches (200 mm, 160 mm) were within

approximately 0.5 points on a scale of 7 points further indicating little difference being perceived by the users. This provides further validation that the change proposed is reasonable and will not affect stair safety.

Construction cost reduction – It is common for the total rise to exceed 144 inches (3658 mm) with oversight of the requirement or minor changes in floor systems and finish flooring options. In particular new floor truss systems and engineered joist materials increase floor thickness and story height especially when added to older designs. This requires the addition of an intermediate landing. Adding a landing increases the footprint of the stairway and the cost if the space is available.

Understanding and Compliance – This change will not increase the number of risers needed in the stairway or make the stairway less safe, or add any significant or perceived increase in energy to climb the stairway. This needed change provides a direct relationship between the vertical rise requirement and the requirements for riser height that would assure better understanding and compliance.

Bibliography:

1. "The influence of rise and going combinations on stair safety"; M.S. Roys, 7th World Conference on Injury Prevention and Safety Promotion, Vienna, June 2004

Cost Impact: This will reduce the cost of construction.

RB132-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.7.3-RB-COOPER

RB133 – 13
R311.7.5.1

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

R311.7.5.1 Risers. The maximum riser height shall be 7¾ 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 ⅜ inch (9.5 mm). Risers shall be vertical or sloped from the underside of the nosing of the tread above at an angle not more than 30 degrees (0.51 rad) from the vertical. Open risers are permitted provided that ~~the opening between treads does not permit the passage of a 4-inch diameter (102 mm) sphere.~~ riser openings between treads 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 lower edge of the riser do not permit the passage of a 4 inch diameter (102 mm) sphere.

~~**Exception:** The opening between adjacent treads is not limited on stairs with total rise of 30 inches (762 mm) or less.~~

Reason: The exception allows unrestricted openings in risers if the stair has a 30" total rise. This is a flawed requirement. Flights stacked in a well could have a total rise of 30 inches and an exposure to a much greater fall distance to the next level or flight below. This change correctly identifies the hazard and the needed requirement applies the language found in section R312, Guard and window fall protection.

Cost Impact: This code change would not increase the cost of construction.

RB133-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.7.5.1-RB-COOPER

RB134 – 13
R311.7.5.1, R312.1.3

Proponent: Rick Davidson, City of Maple Grove, Association of Minnesota Building Officials (rdavidson@maplegrovemn.gov)

Revise as follows:

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). Risers shall be vertical or sloped from the underside of the nosing of the tread above at an angle not more than 30 degrees (0.51 rad) from the vertical. Open risers are permitted provided that the opening between treads does not permit the passage of a ~~4-inch-diameter (102 mm) sphere~~ 6 inch diameter (153 mm) sphere.

Exception: The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.

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)~~ 4⅜ (111 mm) in diameter.

~~**Exceptions**~~ **Exception:**

1. ~~1.~~ The triangular openings at the open side of stair, formed by the riser, tread and bottom rail of a guard, shall not allow passage of a sphere 6 inches (153 mm) in diameter.
2. ~~*Guards* on the open side of stairs shall not have openings which allow passage of a sphere 4⅜ inches (111 mm) in diameter.~~

Reason: Currently the code has three different limitations on openings in guards that could occur within inches of each other. Clearly something is amiss. It is impossible to offer a rational explanation to the public why there are three different opening limitations that are all intended to prevent children from falling through them. Let's put ***some*** meaningful uniformity in the code by allowing spacing on all guards to be 4 3/8 inches and six inches when it comes to riser openings. The proposal increases the spacing on all guards to the 4 3/8 inch standard allowed on guards on stairs and increases the openings on risers to 6 inches which is the standard permitted for the triangular space formed by the riser and the tread.

Cost Impact: None

RB134-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	D

R311.7.5.1-RB-DAVIDSON

RB135 – 13
R311.7.5.3

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

R311.7.5.3 Nosings. The radius of curvature at the nosing shall be no greater than 9/16 inch (14 mm). A nosing projection not less than ¾ inch (19 mm) but not more than 1¼ inches (32 mm) shall be provided on stairways with solid risers. The greatest nosing projection shall not exceed the smallest nosing projection by more than ⅜ inch (9.5 mm) between two stories, including the nosing at the level of floors and landings. Beveling of nosings shall not exceed ½ inch (12.7 mm).

Exceptions: A nosing projection is not required where the tread depth is a minimum of 11 inches (279 mm).

Reason: The addition of the word "projection" corrects and clarifies the intent of the requirement and exception.

Cost Impact: This code change does not increase the cost of construction.

RB135-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.7.5.3-RB-COOPER

RB136 – 13
R311.7.8.2

Proponent: Rick Davidson, City of Maple Grove, Association of Minnesota Building Officials (rdavidson@maplegrovemn.gov)

Revise as follows:

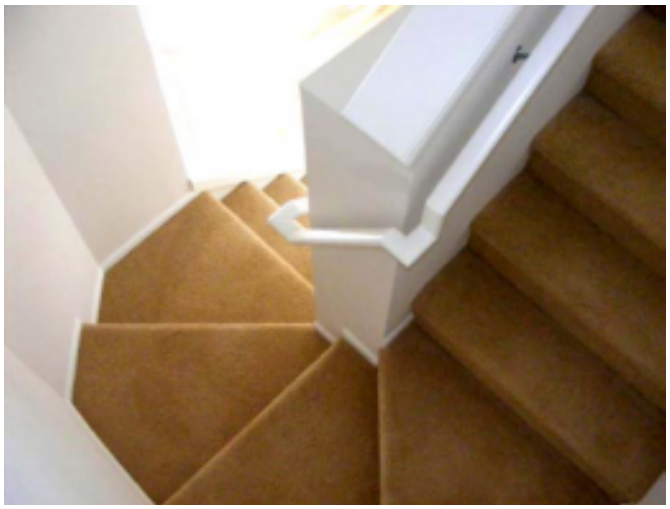
R311.7.8.2 Continuity. Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1½ inch (38 mm) between the wall and the handrails.

Exceptions:

1. Handrails shall be permitted to be interrupted ~~by a~~ newel post<u>s</u> ~~at the turn~~.
2. The use of a volute, turnout, starting easing or starting newel shall be allowed over the lowest tread.
3. <u>Handrails shall be permitted to be interrupted at the transition from a wall to a guard.</u>
4. <u>Handrails shall be permitted to be interrupted where a flight changes direction.</u>

Reason: Handrails are required by the IRC to be continuous with two exceptions. The first allows the rail to be interrupted by a newel post "at a turn". The term "at a turn" can be interpreted in different ways. Does this mean a ninety degree turn, a 180 degree turn, or perhaps a 45 degree turn? Does it apply only when flights are interrupted by a landing or does it also apply to winder stairs? But let's face it. These rails are in dwellings, not public settings. These rails are often installed by homeowners who lack even simple joinery skills. The users of the stairs are familiar with their surroundings. The rails are not required for accessibility purposes. Yet they are required to meet the same standard that applies to high occupant load commercial applications. That is overkill.

If it is safe to remove one's hand when maneuvering around a newel post "at a turn", why is it not safe to do the same on a straight run of a stair, or when negotiating a turn on a winder stair, or when transitioning from a stair enclosed on both sides to open on both sides? Following are some attempts at compliance with current code



Does anyone really believe that the user of any of these stairs would maintain contact between their hand and the railing during the complete traverse of the stair? Likely not, because it requires twisting the wrist and hand in ways that are uncomfortable if not impossible.

Let's be realistic. For dwelling applications, it is reasonable to allow greater leeway in handrail designs. Following are some examples of railings designs that are no more hazardous than the ones deemed 100% compliant. The last example is commonly found by field inspectors on owner (and sometimes contractor) constructed deck stairs. Intermediate posts are necessary to stabilize the guard. But the post interrupts the handrail and results in a correction notice to install a continuous rail. This is usually met by complaints by the homeowner that no unsafe condition exists and many people would agree. Installing an additional railing on this type of stair "just to meet the code" smacks of over-regulation, generates complaints about the unsightly finished product, and adds unnecessary cost to the construction of the stair not to mention the ill will created between building departments and taxpaying homeowners.

It is time to add some reasonableness to the handrail requirements for dwellings. This proposal adds a number of changes. First, it allows the rail to be discontinued whenever a newel post occurs. It deletes the ambiguous term "at the turn" and allows the newel post be placed at any change of direction or at mid flight if desired. Either the interruption of a rail by a newel post is a hazard all of the time or none of the time. This proposal takes the position that a newel post poses no hazard. The second change allows the handrail to be discontinued where the stair makes a change from having walls on the side of the stair to having guards as is illustrated below. The basis for the argument is that creating a turn in the handrail that may cause the wrist to make a full ninety degree turn at this transition is not reasonable and that the average individual will take their hand off the rail anyway to make this transition. Furthermore, this situation, oft encountered when basements are finished, is difficult for most homeowners to overcome. The last change adds an exception allowing the handrail to be discontinued when the stair makes a change in direction as may occur with a winder stair. The following pictures illustrate some of those applications.

This proposal will not lessen the safety of stairs. In some cases it may enhance the safety by creating handrails that are more ergonomically useable. It will enable homeowners to comply with the rules and stay within their skill levels thus keeping costs reasonable.

Cost Impact: None

RB136-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.7.8.2-RB-DAVIDSON

RB137 – 13
R311.7.9

Proponent: Wesley Walters, Clark County Nevada Development Services, representing self

Revise as follows:

R311.7.9 Illumination. All ~~stairs~~ stairways shall be provided with illumination in accordance with Section R303.~~6~~ 7.

Reason: Section R303.7 heading is Stairways not stairs. Stairs are a component of a stairway.

Cost Impact: The code change proposal will not increase the cost of construction.

RB137-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.7.9-RB-WALTERS

RB138 – 13
R311.7.10.1

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

R311.7.10.1 Spiral stairways. Spiral *stairways* are permitted, provided the minimum clear width at and below the *handrail* shall be 26 inches (660 mm) ~~with~~ and the walkline radius is not greater than 24½ inches (622 mm). E~~e~~ach tread ~~having~~ shall have a minimum tread depth not less than 7½ inch (190 mm) ~~minimum tread depth~~ at ~~12 inches (914 mm) from the narrower edge~~ the walkline. All treads shall be identical, and the ~~rise~~ riser height shall be no more than 9½ inches (241 mm). ~~A minimum~~ ~~h~~Headroom shall be not less than 6 feet 6 inches (1982 mm~~) shall be provided~~.

Reason: The difference between Spiral Stairways and Curved Stairways is subject to interpretation. Spiral stairways provide a space saving alternative and by their nature are safely used with taller risers and treads that are narrower at the walkline. Currently spiral stairways may be of unrestricted size. This change defines a reasonable limit for the design of spiral stairways with the allowed "exceptions" for headroom, riser height and tread depth.

Stairs beyond the limit stated would be considered a curved stair. A 24½ inches maximum walkline radius dimension effectively provides a minimum radius no greater than 12½ inches at the inside of the turn. It represents that point at which the 6 inches minimum tread width of winder treads can be achieved with 13 treads in one revolution a typical and common manufacturing standard. Beyond this point curved stairways complying with **R311.7.5 Stair treads and risers** and **R311.7.2 Headroom** would be required. This change is meant to correlate with the newly proposed IRC definition of spiral stairway and eliminating the reference to a supporting column as found in the IBC.

We have also made editorial changes and substituted the code section title terms "walkline" and "riser height" to clarify and provide for more consistent interpretation.

Cost Impact: This code change will not increase the cost of construction.

RB138-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.7.10.1 #1-RB-COOPER

RB139 – 13
R311.7.10.1

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association (sma@stairways.org)

Revise as follows:

R311.7.10.1 Spiral stairways. Spiral *stairways* are permitted, provided the minimum clear width at and below the *handrail* shall be 26 inches (660 mm) with each tread having a ~~7½~~-6¾ inch (~~190~~ 171 mm) minimum tread depth at 12 inches (914 mm) from the narrower edge. All treads shall be identical, and the rise shall be no more than 9½ inches (241 mm). A minimum headroom of 6 feet 6 inches (1982 mm) shall be provided.

Reason: This change is largely editorial. Treads within Spiral Stairways meet the definition of winder treads and are sometimes interpreted to be measured for tread depth in the same fashion. This change simply adjusts the spiral stair tread depth in conformance with the 2009 change in the method of measuring for winder tread depth at the intersections of the walkline with the nosings instead of the prior method which was square to the leading edge. The effective tread depth remains unchanged as can be seen in figure one.

The intent of the 2009 change in measuring methods was to provide for consistent tread depth measurements conforming with stair design methodology not to change or increase tread depth.

The long accepted 7½ inches tread depth was based on the typical spiral layout with 13 treads per revolution or 27.692 degrees per tread. Figure one illustrates the 7½ inches measurement made square to the leading edge of the tread, and also shows the tread depth when measured at the intersections of the walkline and nosings. For the ease of enforcement we have rounded the required tread depth to 6¾ inches

This change is necessary to allow long accepted manufacturing, material and design standards to continue to meet the requirement and does not change the effective depth of the tread.

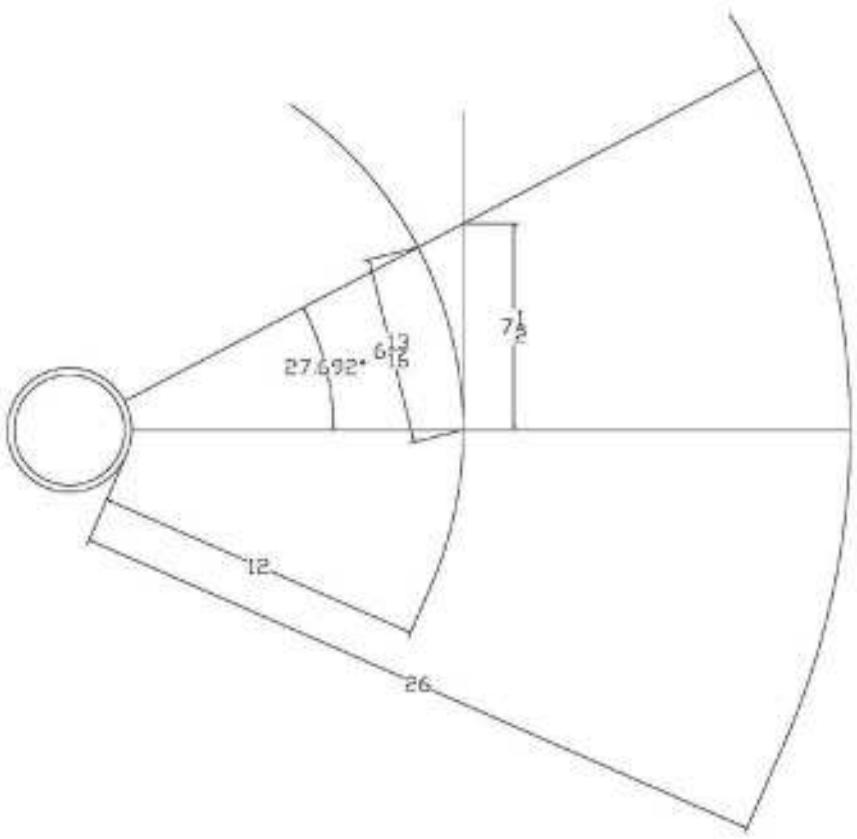


FIGURE ONE illustrates a winder tread from a typical spiral stairway with 13 treads per revolution. The dimensions shown allow comparison of the tread depth when measured square to the leading edge and when measured at the intersection of the walkline with the nosings. This simply shows that the old requirement of 7½ inches needs to change to accommodate the new measuring method cited in **R311.7.5.2.1 Winder Treads.**

Cost Impact: This change will eliminate unintended increases in the cost of construction.

RB139-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.7.10.1 *2-RB-COOPER

RB140 – 13
R202, R311.7.11 (New)

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association (sma@stairways.org)

Add new definition as follows:

SECTION R202
DEFINITIONS

ALTERNATING TREAD DEVICE. A device that has a series of steps between 50 and 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time.

Add new text as follows:

R311.7.11 Alternating tread devices. *Alternating tread devices* shall not be used as an element of a means of egress. *Alternating tread devices* shall be permitted provided the required means of egress stairway or ramp serves the same space at each adjoining level or where a means of egress is not required. The clear width at and below the handrails shall be not less than 20 inches (508 mm).

R311.7.11.1 Treads of alternating tread devices. *Alternating tread devices* shall have a tread depth of not less than 5 inches (127 mm), a projected tread depth of not less than 8 1/2 inches (216 mm), a tread width of not less than 7 inches (178 mm) and a riser height of not more than 9 1/2 inches (241 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projections of adjacent treads. The riser height shall be measured vertically between the leading edges of adjacent treads. The riser height and tread depth provided shall result in an angle of ascent from the horizontal of between 50 and 70 degrees (0.87 and 1.22 rad). The initial tread of the device shall begin at the same elevation as the platform, landing or floor surface.

R311.7.11.2 Handrails of alternating tread devices. *Handrails* shall be provided on both sides of *alternating tread devices* and shall comply with R311.7.8.2 thru R311.7.8.4. Handrail height shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

R311.7.12 Ship ladders. Ship ladders shall not be used as an element of a means of egress. Ship ladders shall be permitted provided a required means of egress stairway or ramp serves the same space at each adjoining level or where a means of egress is not required. The clear width at and below the handrails shall be not less than 20 inches.

R311.7.12.1 Treads of ship ladders. Treads shall have a tread depth of not less than 5 inches (127 mm). The tread shall be projected such that the total of the tread depth plus the *nosing* projection is not less than 8 1/2 inches (216 mm). The riser height shall be not more than 91/2 inches (241 mm).

R311.7.12.2 Handrails of ship ladders. *Handrails* shall be provided on both sides of ship ladders and shall comply with R311.7.8.2 thru R311.7.8.4. Handrail height shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

Reason: Alternating tread devices and ship ladders are used in residential applications but are not regulated. This language adopts the specifications from the IBC providing the needed guidance when they are used. This further clarifies that an Alternating Tread Device and or Ship Ladder cannot be used as an element of a means of egress, and can only be used when a means of egress is not required or when the required means of egress stairway or ramp is provided to serve the same spaces at each level.

Cost Impact: This code change will not increase the cost of construction.

RB140-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.7.11 (NEW)-RB-COOPER

RB141 – 13
R311.8.1

Proponent: Rick Davidson, City of Maple Grove Association of Minnesota Building Officials (rdavidson@maplegrovemn.gov)

Revise as follows:

R311.8.1 Maximum slope. Ramps serving the egress door required by section R311.2 shall have a maximum slope of 1 unit vertical in 12 units horizontal (8.3-percent slope). All other ramps shall have a maximum slope of 1 unit vertical to 8 units horizontal (12.5-percent slope).

Exception: Where it is technically infeasible to comply because of site constraints, ramps may have a maximum slope of one unit vertical in eight horizontal (12.5-percent slope).

Reason: When ramp slope requirements were changed a few years back, the reason stated was to enable persons with disabilities to stay in their homes. However, the scope of the proposal included all ramps, even those that could not be used by persons with disabilities. For example, dwelling additions to older homes sometimes have new basements at a deeper level and the owner wishes to make the transition by ramp. A 1:12 slope can sometimes be difficult to achieve and absorbs much more space than need be. Media rooms are often designed to have sloping floors with ramps serving the seating and again the 1:12 slope is problematic. This proposal gives some relief for those situations where accessibility may not be an issue. This also is consistent with section 1010.3 of the IBC which allows a 1:8 slope for pedestrian ramps not used as a means of egress.

IBC
SECTION 1010
RAMPS

1010.3 Slope. *Ramps* used as part of a *means of egress* shall have a running slope not steeper than one unit vertical in 12 units horizontal (8-percent slope). The slope of other pedestrian *ramps* shall not be steeper than one unit vertical in eight units horizontal (12.5-percent slope).

Cost Impact: None

RB141-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.8.1-RB-DAVIDSON

RB142 – 13
R311.8.1, R311.8.2

Proponent: Glenn Mathewson, MCP., representing self (GlennMathewson@nadra.org)

Revise as follows:

R311.8.1 Maximum slope. Ramps shall have a maximum slope of 1 unit vertical in 12 units horizontal (8.3-percent slope).

Exception: Where it is technically infeasible to comply because of site constraints, ramps shall ~~may~~ have a maximum slope of ~~one~~ 1 unit vertical in ~~eight~~ 8 units horizontal (12.5-percent slope).

R311.8.2 Landings required. There shall be a floor or landing at the top and bottom of each ramp, where doors open onto ramps, and where ramps change directions. The width of the landing perpendicular to the ramp slope shall be not less than the width of the ramp. The depth of the landing in the direction of the ramp slope shall be not less than 36-inches. ~~A minimum 3-foot-by-3-foot (914 mm by 914 mm) landing shall be provided:~~

~~1. At the top and bottoms of ramps.~~
~~2. Where doors open onto ramps.~~
~~3. Where ramps change directions.~~

Reason:-It is inconsistent to present slope in one section using numerical symbols, and then in the exception use textual language. It appears to be more common in the IRC to use numerical symbols, thus the choice to modify the exception.
-Use of the word "may" is in appropriate when referring to a maximum value. "Shall" is clearer that the maximum value is the undisputable limit.
All other landings in the IRC (doors/stairs) reference the width of the feature they serve, as this is sensible. Currently ramp provisions refer to a specific geometric width, and would not properly and safely accommodate a ramp that was wider than the minimum 36 inches. Likely…landings are already built to the width of the ramps they serve.
-The use of a list of landing locations is not consistent with other similar IRC sections. The proposed language is more similar to that used to describe landings on stairs…a very similar feature.

Cost Impact: The code change proposal will not increase the cost of construction.

RB142-13

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R311.8.1-RB-MATHEWSON

RB143 – 13
R312.1.1

Proponent: Rick Davidson, City of Maple Grove, Association of Minnesota Building Officials (rdavidson@maplegrovemn.gov)

Revise as follows:

R312.1.1 Where required. *Guards* shall be located along ~~open-sided walking surfaces, including~~ the open sides of floors, 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*.

Reason: The first portion of the proposal deletes the requirement that guards be located along open sided walking surfaces and replaces it with the same language found in the previous IRC. This is necessary because the term "open sided walking surfaces" is so broad in scope that it could be and is being applied to almost any surface on or in a building or a lot. It could be interpreted to require guards being installed around window wells, on the top of retaining walls, along driveways and sidewalks, on landings near window wells, at the edge of swimming pools, and even at the edge of flat roofs. The definitions for floors, stairs, ramps, and landings are well established. Everyone understands the application with these terms. It is reasonable to use terms that are understandable to all.

The second part of the proposal deletes the reference to measuring the height of the walking surface three feet from the edge of the walking surface and returns it to the language that existed in the IRC since its inception and in the previous model codes for decades.

It seems to be a widely held belief that the Uniform Building Code required that a measurement from floor to grade be taken at a point five feet from the floor to determine if a guard was required.

But, the Uniform Building Code never said that is how the distance should be measured nor did the BOCA National Building Code or the Southern Building Code. They all stated that the 30 inch height (15 ½ inches in the National Building Code and 30 inches in the Southern Building Code) be measured to the floor or grade below or very similar language.

Then where did the five foot measuring requirement come from? It came from the definition of "grade". For years, ICBO staff taught that the use of the term "grade" in the phrase "30 inches above floor or grade below" was defined and that the definition in the UBC required that grade be measured five feet from the building or if the property line was less than five feet from the building then it would be measured from a point between the building and the property line.

This creates at least two inconsistencies if the argument was that the five foot distance was safety oriented. First, you only measured five feet over if what was below the walking surface was "grade". If it were a floor, you just measured straight down. Second, if the building was near a property line, you only measured to the property line even if there were a severe drop at the property line. Theoretically under the UBC, one could have a walking surface that was adjacent to a property line with a 30 foot drop at the property line and no guard.

The idea that one should measure the 30 inch distance at some point other than the base of the walking surface was strictly an ICBO opinion and not binding on any building official. Based on the inconsistencies cited, there is certainly room for other opinions. Because a portion of the language in the UBC definition that stated that grade was between the building and the property line did not make it into the IRC, the IRC version requires that the measurement extend to adjoining lots in some cases.

But there is more.

The BOCA National Building Code required guards be provided when the walking surface was more than 15 ½ inches above the floor or grade below. But the BOCA code did not define "grade", only "grade plane". And the definition of "grade plane" was used exclusively to determine the reference point for the height and number of stories of a building for purposes of determining compliance with height and number of stories limitations based on use and type of construction. It is not known how BOCA staff taught how to measure for guards but the language in the BOCA code is the same as it has been in the IRC since its inception.

The Southern Building Code provided a definition for "grade" but the method of measuring the height of a floor surface was stated to be "30 inches above ***finished ground level*** or a floor below". While grade required measuring a distance of six feet away, that term was not used in defining when a guard was required. It is not known how SBCCI staff taught how to measure guards but it doesn't appear the Southern Building Code provided any means to take the measurement at any location but straight down from the edge of the walking surface.

More about the UBC. Was it really intended that the measurement requiring guards be taken five feet from the walking surface or was that just happenstance and poor choices of terms in the code sections?

I would argue that it was never intended that the method used to determine whether or not a guard was required be five feet from the walking surface. Besides the inconsistencies above, the UBC definition of "grade" states that it is the distance "between the ***building*** and the property line". The term "building" does not appear to mean a floor or walking surface that could be used to determine guard requirements.

And then there is more. The UBC contained references to measuring grade at a distance away from the building dating back at least into the 1930's. Apparently the game of piling dirt next to a building to reduce the height or number of stories is not new. Grade was always about height and number of stories of the building, not as a means to require a guard.

An explanation of the term "grade" from the "*Design Guide – 1988 UBC*" by Alfred Goldberg is provided below. Mr. Goldberg states that the "determination of the grade level is important to the designer for several reasons, including the qualification of a level as a basement and the measurement of the allowable overall height of the building." Mr. Goldberg goes on to explain the nuances of application of the term "grade" and cautions on the "repercussions" of errors in applying the rules. Not once in Mr. Goldberg's book does he reference that "grade" has anything to do with guards.

In the "*Handbook to the Uniform Building Code, An Illustrative Commentary*" published by ICBO, the statement is made in regards to "grade" that "This definition is important in determining the number of stories within a building as well as its height in feet." There is also a discussion on the issue of guards but never once is there a reference to how one determines whether a guard is required. One would think it is important to create the link because the section regarding guards only states measuring to the floor or grade below.

That brings us to today. Given that the Southern Building Code, the National Building Code, the CABO One and Two Family Dwelling Code, and possibly the Uniform Building Code (depending on how it was interpreted) all directed that the measurement used to determine whether or not a guard was required be taken by measuring to the area below the edge of the walking surface, did an unsafe condition exist? No evidence has been submitted with any prior code change to suggest that it did.

Then there are the practical aspects. What distance should a "landing area" be if one were to create one? Should that landing area extend onto another property? The code has always regulated building construction based on situations on the lot in question and given no credence to what occurs on an adjoining lot.

And there are other practicality issues. Permits are not required for a host of "walking surfaces". How does one enforce a guard requirement for things like concrete sidewalks? Do we really see sharp drops or cliffs adjoining low decks or are we more likely to see a gently sloping hill and are they a hazard? And suppose I create a floor or walking surface adjacent my property line and the land on the other side slopes sufficiently that a guard would be required but my neighbor has a fence at the top of the slope on his side of the property line. Do I still need to put up a guard right next to his fence? And if I can use the fence for the guard, does it need to meet the load requirement of 200 pounds at the top? And if I have a walking surface that doesn't require a guard but at a later date the neighboring property owner installs a retaining wall that places my walking surface in violation, is he required to install the guard? He was the one who created the hazard! Will the timing of events result in one situation requiring a guard and another not? How does one explain this to a homeowner and make sense of it?

And last is the issue of permitting of decks, porches, balconies, landings and other low floor surfaces. Low decks were exempted from permits in large part because guards were not required, and they might still not be required. One can only guess that proposals are being drafted to require permits for decks requiring guards. But the inquiry that comes into the building department regarding the need for a guard will go something like this. Q. "Do I need a permit for a deck that will be 28 inches above the ground?" A. "You will need a permit if the ground within X feet of the deck will be more than 30 inches below the floor of the deck at any point around the deck." Q. "I'm a homeowner. I know it will be less than 30 inches above grade around the perimeter of the deck but I don't know about X feet out. So do I need a permit or not? And if I take out a permit and it turns out I didn't need one, I will get my money back, right?"

Homeowners don't have access to sophisticated equipment. They will be dependent on string levels and garden hoses. Accuracy may not be a strong suit. Where will this place the building department?

It is necessary that there be clarity in where a guard is required so that there is uniformity of application and that intended safeguards are in place. It is also necessary that those requirements achieve in all cases what they set out to do. Because most, if not all, of the national model codes did not require that the determining factor of when a guard was required was anything but a direct measurement from the edge of the floor to the ground or floor directly below.

tion) to circulate the heated air to and from the unit. In the context of the code, the primary use of the term "furnace" refers to heating appliance units that combine a combustion chamber with related components, one or more heat exchangers and an air-handling system.

GLAZING AREA. The interior surface area of all glazed fenestration, including the area of sash, curbing or other framing elements, that enclose conditioned space. Includes the area of glazed fenestration assemblies in walls bounding conditioned basements.

❖ The glazing area includes not only the surface area of the exposed glazing but also the framing elements, including the sash and curbing. The amount of glazing area is regulated for natural light by Section R303; however, this definition applies to the energy efficiency provisions of Chapter 11.

GRADE. The finished ground level adjoining the building at all exterior walls.

❖ This is the point at which the finished exterior ground level intersects the exterior wall of the building. The grade around a building may remain relatively constant, such as on a flat site, or may change dramatically from one point to the next if the site is steeply sloping.

GRADE FLOOR OPENING. A window or other opening located such that the sill height of the opening is not more than 44 inches (1118 mm) above or below the finished ground level adjacent to the opening.

❖ In the requirements for emergency escape and rescue openings found in Section R310, the size of the openings may be reduced if they are grade floor openings. These are windows or other openings that are located within close proximity to the finished ground level. The sill of a grade floor opening may be located either above or below the adjacent ground level, provided it is located no more than 44 inches (1118 mm) vertically from the level of the ground.

GRADE, PIPING. See "Slope."

GRADE PLANE. A reference plane representing the average of the finished ground level adjoining the building at all exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the lot line or, where the lot line is more than 6 ft (1829 mm) from the building between the structure and a point 6 ft (1829 mm) from the building.

❖ This definition can be important in determining the number of stories within a building as well as its height in feet. In some cases, the finished surface of the ground may be artificially raised with imported fill to create a higher grade plane around a building to decrease the number of stories or height. The definition requires that the lowest elevation within 6 feet (1829 mm) of the exterior wall be used to determine the grade plane.

GRIDDED WATER DISTRIBUTION SYSTEM. A water distribution system where every water distribution pipe is interconnected so as to provide two or more paths to each fixture supply pipe.

❖ These systems offer the advantage of a simplistic design, typically smaller sized distribution lines and aid water conservation. In a traditional water distribution system, the water contained in the larger diameter piping is wasted when the line is opened and the user has to wait until the water reaches the desired temperature.

Parallel or gridded water distribution systems differ from branch systems which have individual supply pipes that extend to each fixture or outlet from a central supply point [see Commentary Figure R202(1)]. The central supply point is a multiple-outlet manifold to which the distribution lines connect [see Commentary Figure R202(2)].

GROSS AREA OF EXTERIOR WALLS. The normal projection of all exterior walls, including the area of all windows and doors installed therein.

❖ The calculation for determining the gross area of exterior walls for energy efficiency purposes is based on the total area of the entire exterior surface, including openings such as windows and doors.

GROUND-SOURCE HEAT PUMP LOOP SYSTEM. Piping buried in horizontal or vertical excavations or placed in a body of water for the purpose of transporting heat transfer liquid to and from a heat pump. Included in this definition are closed loop systems in which the liquid is recirculated and open loop systems in which the liquid is drawn from a well or other source.

❖ This definition assists the user with a ready means of distinguishing ground-source heat pump loop systems from other hydronic systems.

GUARD. A building component or a system of building components located near the open sides of elevated walking surfaces that minimizes the possibility of a fall from the walking surface to the lower level.

❖ A guard is a component or system of components whose function is the prevention of falls from an elevated area. Placed adjacent to an elevation change, a guard must be of adequate height, strength and configuration to help prevent people, especially small children, from falling over or through the guard to the area below.

HABITABLE SPACE. A space in a building for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered habitable spaces.

❖ An area within a building used for living, sleeping, dining or cooking is a habitable space. Those areas not meeting this definition include bathrooms, closets, hallways and utility rooms. Habitable spaces are typically occupied, and as such they are more highly regulated than accessory use areas.

HANDRAIL. A horizontal or sloping rail intended for grasping by the hand for guidance or support.

to assist ramp users. This provision differs from that of the IBC, where a slope of one unit vertical in 20 units horizontal (5-percent slope) and a ramp rise of 6 inches (152 mm) establishes the limits.

R311.6.3.1 Height. Handrail height, measured above the finished surface of the ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

❖ Where handrails are required, they must be installed at a height of at least 34 inches (864 mm) and not more than 38 inches (965 mm), measured vertically from the finished surface of the ramp slope. This height should be measured to the top of the handrail.

R311.6.3.2 Handrail grip size. Handrails on ramps shall comply with Section R311.5.6.3.

❖ See the commentary for Section R311.5.6.3.

R311.6.3.3 Continuity. Handrails where required on ramps shall be continuous for the full length of the ramp. 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 1.5 inches (38 mm) between the wall and the handrails.

❖ The continuity requirement for the ramp handrail is similar to the continuity requirement for the stair handrail. See the commentary for Section R311.5.6.2

SECTION R312
GUARDS

R312.1 Guards. Porches, balconies, ramps or raised floor surfaces located more than 30 inches (762 mm) above the floor or grade below shall have guards not less than 36 inches (914 mm) in height. Open sides of stairs with a total rise of more than 30 inches (762 mm) above the floor or grade below shall have guards not less than 34 inches (864 mm) in height measured vertically from the nosing of the treads.

Porches and decks which are enclosed with insect screening shall be equipped with guards where the walking surface is located more than 30 inches (762 mm) above the floor or grade below.

❖ The guard provisions of the IRC address the issue of protecting occupants from falling from any type of elevated walking surface. The provisions in Section R312 provide the scoping requirements as well as the general construction requirements for the guards. Besides this section, code users should be aware that Section R301.5 contains the design load criteria for guards.

Section R312.1 of the code establishes the requirement for and the minimum height requirements for guards. The code provides for guard protection at open sides along raised floor or walking surfaces such as those at balconies, mezzanines, stairways, ramps, porches and landings that are more than 30 inches (762 mm) above the grade or floor surface below.

The requirements for guards on stairs are different from other guard requirements in two ways. The first is the scoping requirements that establish the need for the guard, and the second is the required height of the guard. The scoping requirement for guards along open sides of stairs not only applies to the portion of a stairway that is more than 30 inches (762 mm) above the adjacent floor, but it will also apply to the entire open side of the stair, including the parts that are less than 30 inches (762 mm) above the floor. This requirement applies to the entire "open side" of the stairway, if any point of the open side is more than 30 inches (762 mm) high. See Commentary Figures R312.1(1) and (2) for examples of how this provision is applied.

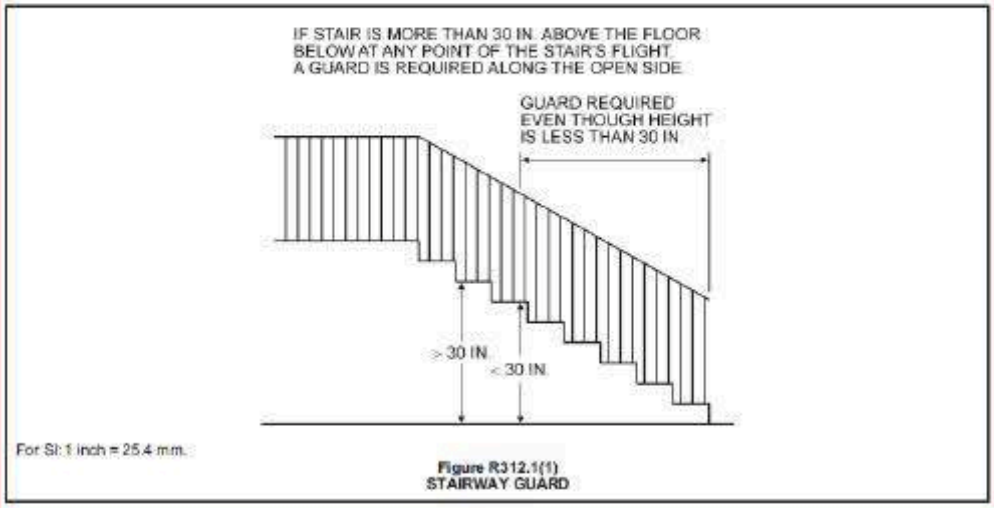


Figure R312.1(1)
STAIRWAY GUARD

FIRE RESISTANCE or **FIRE-RESISTIVE CONSTRUCTION** is construction to resist the spread of fire, details of which are specified in this code.

FIRE-RETARDANT-TREATED WOOD is any wood product impregnated with chemicals by a pressure process or other means during manufacture, and which, when tested in accordance with UBC Standard 8-1 for a period of 30 minutes, shall have a flame spread of not over 25 and show no evidence of progressive combustion. In addition, the flame front shall not progress more than $10^1/_2$ feet (3200 mm) beyond the center line of the burner at any time during the test. Materials that may be exposed to the weather shall pass the accelerated weathering test and be identified as Exterior type, in accordance with UBC Standard 23-4. Where material is not directly exposed to rainfall but exposed to high humidity conditions, it shall be subjected to the hygroscopic test and identified as Interior Type A in accordance with UBC Standard 23-4.

All materials shall bear identification showing the fire performance rating thereof. Such identifications shall be issued by an approved agency having a service for inspection of materials at the factory.

FLAMMABLE LIQUID. See the Fire Code.

FLOOR AREA is the area included that the surrounding exterior walls of a building or portion thereof, exclusive of vent shafts and courts. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above.

FM is Factory Mutual Engineering and Research, 1151 Boston-Providence Turnpike, Norwood, Massachusetts 02062.

FOAM PLASTIC INSULATION is a plastic that is intentionally expanded by the use of a foaming agent to produce a reduced-density plastic containing voids consisting of hollow spheres or interconnected cells distributed throughout the plastic for thermal insulating or acoustical purposes and that has a density less than 20 pounds per cubic foot (320 kg/m^3).

FOOTING is that portion of the foundation of a structure that spreads and transmits loads directly to the soil or the piles.

FRONT OF LOT is the front boundary line of a lot bordering on the street and, in the case of a corner lot, may be either frontage.

SECTION 208 — G

GARAGE is a building or portion thereof in which a motor vehicle containing flammable or combustible liquids or gas in its tank is stored, repaired or kept.

GARAGE, PRIVATE, is a building or a portion of a building, not more than 1,000 square feet (93 m^2) in area, in which only motor vehicles used by the tenants of the building or buildings on the premises are stored or kept. (See Section 312.)

GARAGE, PUBLIC, is any garage other than a private garage.

GAS ROOM is a separately ventilated, fully enclosed room in which only toxic and highly toxic compressed gases and associated equipment and supplies are stored or used.

GRADE (Adjacent Ground Elevation) is the lowest point of elevation of the finished surface of the ground, paving or sidewalk within the area between the building and the property line or, when the property line is more than 5 feet (1524 mm) from the building, between the building and a line 5 feet (1524 mm) from the building.

GRADE (Lumber) is the classification of lumber in regard to strength and utility.

GUARDRAIL is a system of building components located near the open sides of elevated walking surfaces for the purpose of minimizing the possibility of an accidental fall from the walking surface to the lower level.

GUEST is any person hiring or occupying a room for living or sleeping purposes.

GUEST ROOM is any room or rooms used or intended to be used by a guest for sleeping purposes. Every 100 square feet (9.3 m^2) of superficial floor area in a dormitory shall be considered to be a guest room.

SECTION 209 — H

HABITABLE SPACE (ROOM) is space in a structure for living, sleeping, eating or cooking. Bathrooms, toilet compartments, closets, halls, storage or utility space, and similar areas, are not considered habitable space.

HANDLING is the deliberate movement of material by any means to a point of storage or use.

HANDRAIL is a railing provided for grasping with the hand for support. See also "guardrail."

HAZARDOUS PRODUCTION MATERIAL (HPM) is a solid, liquid or gas that has a degree of hazard rating in health, flammability or reactivity of 3 or 4 and that is used directly in research, laboratory or production processes that have, as their end product, materials that are not hazardous.

HEALTH HAZARD is a classification of a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed persons. The term "health hazard" includes chemicals that are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents that act on the hematopoietic system, and agents that damage the lungs, skin, eyes or mucous membranes.

HEIGHT OF BUILDING is the vertical distance above a reference datum measured to the highest point of the coping of a flat roof or to the deck line of a mansard roof or to the average height of the highest gable of a pitched or hipped roof. The reference datum shall be selected by either of the following, whichever yields a greater height of building:

1. The elevation of the highest adjoining sidewalk or ground surface within a 5-foot (1524 mm) horizontal distance of the exterior wall of the building when such sidewalk or ground surface is not more than 10 feet (3048 mm) above lowest grade.

2. An elevation 10 feet (3048 mm) higher than the lowest grade when the sidewalk or ground surface described in Item 1 is more than 10 feet (3048 mm) above lowest grade.

The height of a stepped or terraced building is the maximum height of any segment of the building.

HELIPORT is an area of land or water or a structural surface that is used, or intended for use, for the landing and take-off of helicopters, and any appurtenant areas that are used, or intended for use, for heliport buildings and other heliport facilities.

HELISTOP is the same as a heliport, except that no refueling, maintenance, repairs or storage of helicopters is permitted.

HIGHLY TOXIC MATERIAL is a material that produces a lethal dose or a lethal concentration that falls within any of the following categories:

hour for unenclosed mezzanines. The clear height above and below the mezzanine floor construction shall not be less than 7 feet (2134 mm).

2. There shall not be more than two levels of mezzanines in a room. However, there is no limitation on the number of mezzanines within a room.

3. The aggregate area of mezzanines within a room shall not exceed one third of the area of the room in which they are located.

4. All portions of a mezzanine shall be open and unobstructed to the room in which they are located, except for columns and posts and protective walls or railings not more than 44 inches (1118 mm) in height.

EXCEPTIONS: 1. Partitioning may be installed if either of the following conditions exist:

1.1 The aggregate floor area of the enclosed space does not exceed 10 percent of the mezzanine area, or

1.2 The occupant load of the enclosed area of the mezzanine does not exceed 10.

2. A mezzanine having two or more means of egress need not be open into the room in which it is located, provided at least one of the means of egress gives direct access to a protected corridor, exit court or exit.

3. In industry facilities, mezzanines used for control equipment may be glazed on all sides.

5. Two means of egress shall be provided from a mezzanine when two are required by Table 10-A.

6. If any required means of egress enters the room below, the occupant load of the mezzanine shall be added to the occupant load of the room in which it is located.

SECTION 508 — FIRE-RESISTIVE SUBSTITUTION

When an approved automatic sprinkler system is not required throughout a building by other sections of this code, it may be used in a building of Type II One-hour, Type III One-hour and Type V One-hour construction to substitute for the one-hour fire-resistive construction. Such substitution shall not waive or reduce the required fire-resistive construction for:

1. Occupancy separations (Section 302.3).

2. Exterior wall protection due to proximity of property lines (Section 503.2).

3. Area separations (Section 504.6).

4. Dwelling unit separations (Section 310.2.2)

5. Shaft enclosures (Section 711).

6. Corridors (Sections 1004.3.4.3.1 and 1004.3.4.3.2).

7. Stair enclosures (Section 1005.3.3).

8. Exit passageways (Section 1005.3.4).

9. Type of construction separation (Section 601.1).

10. Boiler, central heating plant or hot-water supply boiler room enclosures (Section 302.5).

SECTION 509 — GUARDRAILS

509.1 Where Required. Unenclosed floor and roof openings, open and glazed sides of stairways, aisles, landings and ramps, balconies or porches, which are more than 30 inches (762 mm) above grade or floor below, and roofs used for other than service of the building shall be protected by a guardrail. Guardrails shall be provided at the ends of aisles where they terminate at a fascia of boxes, balconies and galleries.

EXCEPTION: Guardrails need not be provided at the following locations:

1. On the loading side of loading docks.

2. On the auditorium side of a stage, raised platforms and other raised floor areas such as runways, ramps and side stages used for entertainment or presentation. Along the side of an elevated walking surface when used for the normal functioning of special lighting or for access and use of other special equipment. At vertical openings in the performance area of stages.

3. Along vehicle service pits not accessible to the public.

509.2 Height. The top of guardrails shall not be less than 42 inches (1067 mm) in height.

EXCEPTIONS: 1. The top of guardrails for Group R, Division 3 and Group U, Division 1 Occupancies and interior guardrails within individual dwelling units, Group R, Division 3 congregate residences and guest rooms of Group R, Division 1 Occupancies may be 36 inches (914 mm) in height.

2. The top of guardrails on a balcony immediately in front of the first row of fixed seats and that are not at the end of an aisle may be 26 inches (660 mm) in height.

3. The top of guardrails for stairways, exclusive of their landings, may have a height as specified in Section 1003.3.3.6 for handrails.

Where an elevation change of 30 inches (762 mm) or less occurs between an aisle parallel to the seats (cross aisle) and the adjacent floor or grade below, guardrails not less than 26 inches (660 mm) above the aisle floor shall be provided.

EXCEPTION: Where the backs of seats on the front of the cross aisle project 24 inches (610 mm) or more above the adjacent floor of the aisle, a guardrail need not be provided.

The top of guardrails at the ends of aisles terminating at the fascia of boxes, balconies and galleries shall extend for the width of the aisle and be no closer than 42 inches (1067 mm) to the closest surface of the aisle where there are steps and 36 inches (914 mm) otherwise.

509.3 Openings. Open guardrails shall have intermediate rails or an ornamental pattern such that a sphere 4 inches (102 mm) in diameter cannot pass through.

EXCEPTIONS: 1. The open space between the intermediate rails or ornamental pattern of guardrails in areas of commercial and industrial-type occupancies which are not accessible to the public may be such that a sphere 12 inches (305 mm) in diameter cannot pass through.

2. The triangular openings formed by the riser, tread and bottom element of a guardrail at the open side of a stairway may be of such size that a sphere 6 inches (152 mm) in diameter cannot pass through.

For guardrail requirements at grandstands, bleachers or other elevated seating facilities, see Section 1008.5.7.

The floor area calculation is of such importance that the designer should establish this figure early in the preliminary discussions with the local enforcement agency.

> **Sec. 408. GARAGE is a building or portion thereof in which a motor vehicle containing flammable or combustible liquids or gas in its tank, is stored, repaired or kept.**
>
> **GARAGE, PRIVATE, is a building or a portion of a building, not more than 1000 square feet in area, in which only motor vehicles used by the tenants of the building or buildings on the premises are stored or kept. (See Section 1101.)**
>
> **GARAGE, PUBLIC, is any garage other than a private garage.**

There are several definitions, and three different classifications, of garages. The least restrictive definition refers to a garage in conjunction with a dwelling or a small office building: a "private garage." It is classified as a Group M Occupancy.

When the garage is larger, or if it is in a larger building or serves occupants other than those in the building, it is called a "public garage." This garage is classified as a Group B, Division 1 Occupancy.

The third class of garage is a "repair garage" classed as a Group H, Division 4 Occupancy.

The reason for the three different garage classes is illustrated in Table No. 5-C. In a Type III-N building, a Group B, Division 1 Occupancy allows a floor area of 12,000 square feet. In a similar building, a Group H, Division 4 Occupancy limits the floor area to 7,500 square feet. The smaller allowable area is due to the presence of repair equipment, including torches and flammable liquids (oil and gasoline) which may permeate the area when repairs are made.

On the other hand, the Group M private garage is limited to 1,000 square feet with a maximum of 3,000 square feet in any one building. The provisions in Chapter 11 enable the private garage to reach the maximum of 3,000 square feet in the building provided each 1,000 square foot area is separated from another by a one-hour area separation wall.

> **GRADE (Adjacent Ground Elevation) is the lowest point of elevation of the finished surface of the ground, paving or sidewalk within the area between the building and the property line or, when the property line is more than 5 feet from the building, between the building and a line 5 feet from the building.**

This definition requires that the elevation of the ground surface to be used be either:

- *the level between the building and the property line, or*
- *where the property line is more than five feet from the building, the lowest point within a distance of five feet from the building.*

The code intent is to establish what would be a "natural" ground line and to prevent someone from piling soil up against the foundation of the building and claiming that it represents the grade. By requiring the measurement to be the lowest elevation within five feet of the building, the code establishes a five-foot width to represent grade and not simply a mound of earth against the foundation. A retaining wall can be used to establish this five-foot level width.

The determination of the grade level is important to the designer for several reasons, including the qualification of a level as a basement and the measurement of the allowable overall height of the building. (See Figure 4-2.)

HEIGHT OF BUILDING is the vertical distance above a reference datum measured to the highest point of the coping of a flat roof or to the deck line of a mansard roof or to the average height of the highest gable of a pitched or hipped roof. The reference datum shall be selected by either of the following, whichever yields a greater height of building:

1. The elevation of the highest adjoining sidewalk or ground surface within a five-foot horizontal distance of the exterior wall of the building when such sidewalk or ground surface is not more than 10 feet above lowest grade.
2. An elevation 10 feet higher than the lowest grade when the sidewalk or ground surface described in Item 1 above is more than 10 feet above lowest grade.

The height of a stepped or terraced building is the maximum height of any segment of the building.

Height of building discussed in this definition relates to the provisions in Chapter 5 for considering the maximum height for a given type of construction and number of stories in a building.

Height and stories are interdependent in Table No. 5-D wherein the limitations for the height in feet and the number of stories are established. The provisions for measuring the height require reference to the ground surface. The five-foot horizontal width in Item 1 is comparable to the five-foot width measurement for determining "grade."

The concern with the method of height measurement is based on the fire and panic hazards presented by taller structures or those with more levels of occupancy. Many times the misinterpretation or misapplication of the height and story measurement has been the result of a desire to

avoid the added exit and fire protection requirements that apply when a building is three or more stories in height.

The designer is cautioned that any error in this part of the design can produce considerable repercussions; hence, the designer should use a conservative approach to the height measurement.

HOTEL is any building containing six or more guest rooms intended or designed to be used, or which are used, rented or hired out to be occupied, or which are occupied for sleeping purposes by guests.

The hotel is another sub-group of the R-1 Occupancy, multi-family usage. The controlling criterion is the number of guest rooms rather than dwelling units (as is used in the apartment house definition).

MECHANICAL CODE is the Uniform Mechanical Code promulgated jointly by the International Conference of Building Officials and the International Association of Plumbing and Mechanical Officials, as adopted by this jurisdiction.

One of the codes referenced in the UBC provisions is the Mechanical Code, in particular the Uniform Mechanical Code (UMC). It is adopted by a jurisdiction in a similar manner as is the UBC.

MEZZANINE OR MEZZANINE FLOOR is an intermediate floor placed within a room.

The construction provisions for mezzanines are contained in Section 1716. The key determinant in whether a level qualifies as a mezzanine is stated in Item 3 of that section, which reads:

3. The aggregate area of mezzanines within a room shall not exceed one third the area of the room in which it is located. Intermediate floor levels that are 6 or more feet above grade shall be considered a story when the area of such level exceeds one third the area of the room in which it is located.

Sec. 415. NONCOMBUSTIBLE as applied to building construction material means a material which, in the form in which it is used, is either one of the following:

1. **Material of which no part will ignite and burn when subjected to fire. Any material conforming to U.B.C. Standard No. 4-1 shall be considered noncombustible within the meaning of this section.**
2. **Material having a structural base of noncombustible material as defined in Item No. 1 above, with a surfacing material not over 1/8 inch thick which has a flame-spread rating of 50 or less.**

"Noncombustible" does not apply to surface finish materials. Material required to be noncombustible for reduced clearances to flues, heating appliances or other sources of high temperature shall refer to material conforming to Item No. 1. No material shall be classed as noncombustible which is subject to increase in combustibility or flame-spread rating, beyond the limits herein established,

HANDBOOK

TO THE

UNIFORM BUILDING CODE

An illustrative commentary

International Conference of Building Officials

SECTION 208 — G

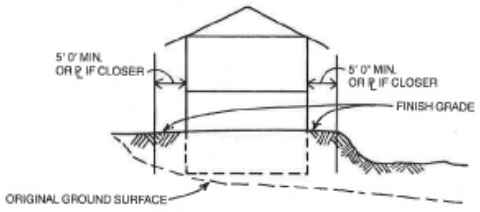
GRADE (Adjacent Ground Elevation). The code indicates that grade is the lowest point of elevation of the finished surface of the ground within an area between the building and property line or where the property line is more than 5 feet (1524 mm) from the building between the building and a line 5 feet (1524 mm) from the building.

This definition is important in determining the number of stories within a building as well as its height in feet. In some cases the finished surface of the ground may be artificially raised with imported fill to create a higher grade around a building so as to decrease the number of stories or height in feet. The code does not prohibit this practice, and as long as a building meets the code definition and restrictions for height or number of stories, the intent of the code is met. See Figure 208-1.

SECTION 209 — H

HEIGHT OF BUILDING. The critical feature in the definition of height of building is the case where the building is on a sloping site. In the case of a sloping site, the height of the building is measured as depicted in Figure 209-1.

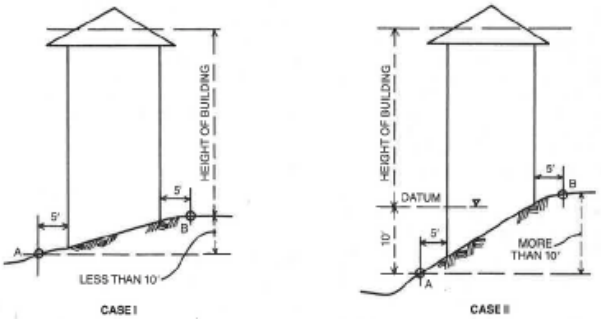
Where the building is stepped or terraced, the code intends that the height of such building is the maximum height of any segment of the building. It may be appropriate under certain circumstances that the number of stories in a building be determined in the same manner. Because of the varying requirements of the code which are related to the number of stories, such as exiting, fire resistance of construction, shaft enclosures, etc., each case should be judged individually based on the characteristics of the site and construction. In addition to those factors which are related to the number of stories, other items to consid-



For SI: 1 foot = 304.8 mm.

USE OF BUILT-UP SOIL TO RAISE FINISH GRADE

Figure 208-1



For SI: 1 foot = 304.8 mm.

DETERMINATION OF BUILDING HEIGHT IN FEET (mm)

Figure 209-1

Application Example 508-1

GIVEN: One-story building of Type V-N construction with an automatic fire-sprinkler system installed throughout. The building has no yards.

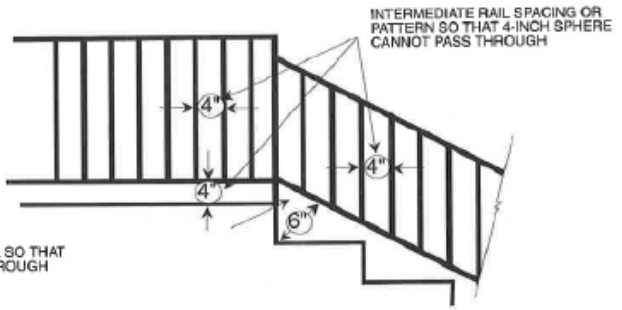
DETERMINE: Maximum allowable floor area for the building housing either a Group B Occupancy or a Group A, Division 2.1 Occupancy.

SOLUTION: *Case I*—Group B Occupancy:
The building can be evaluated with the automatic fire sprinklers used either to increase area according to Section 505.3 or to substitute for one-hour construction according to Section 508, thus upgrading the construction from Type V-N to Type V One-hour.

A. Section 505.3. Basic allowable area according to Table 5-B is 8,000 square feet for Type V-N construction.
Allowable Area = 8,000 x 3 = 24,000 square feet.

B. Section 508. Basic allowable area according to Table 5-B is 14,000 square feet for Type V One-hour. Obviously, it is more advantageous to use the provisions of Section 505.3.

Case II—Group A, Division 2.1 Occupancy:
Referring to Table 5-B, it is seen that a Group A, Division 2.1 Occupancy is not permitted to be of Type V-N construction. Thus, the automatic fire-sprinkler system must be used as a substitute for one-hour construction in order that the building will qualify as Type V One-hour construction. The allowable area for this type of construction is 10,500 square feet housing a Group A, Division 2.1 Occupancy.



For SI: 1 inch = 25.4 mm.

GUARDRAILS

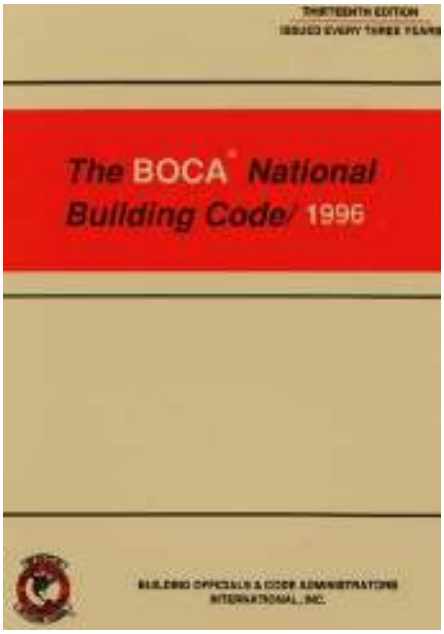
Figure 509-1

SECTION 509 — GUARDRAILS

In this section, the code provides for guardrail protection for unenclosed floor and roof openings, open and glazed sides of stairways, landings and ramps, and porches, which are more than 30 inches (762 mm) above grade or a floor or other surface below. Also, the protection is required for roofs which are used other than for service of the building and thus are subject to use by individuals walking on the roof. The need for guardrails in these circumstances is evident, although the arbitrary limit of 30 inches (762 mm) above grade or floor below is subject to conjecture. Nonetheless, in the case of the U.B.C., it is assumed that the height of 30 inches (762 mm) does not create a significant safety hazard.[5]

The guardrail must be of adequate height to prevent someone from falling over the edge of the protected areas and be designed to prevent someone, including small children, from falling through under the top rail. Therefore, the code establishes 42 inches (1067 mm) as the minimum height which is recognized nationally as the proper height for guardrail protection. The code also requires that for open-type rails, intermediate members be provided so that a sphere 4 inches (102 mm) in diameter cannot pass through between the intermediate members, a requirement which prevents small children from falling through the guardrail assembly. See Figure 509-1. The code also lessens the height for open sides of stairs; they may be protected with a guardrail having a height the same as for stair railings as provided for in Section 1006.9. There are several more exceptions to the requirements for guardrails, as follows:

- Guardrails are not required on the loading side of docks or along vehicle service pits not accessible to the public for obvious reasons.
- Guardrails are required to be only 36 inches (914 mm) high in dwellings, Group U Occupancies, and within individual apartments or guest rooms in Group R, Division 1 Occupancies. This lower height is based on the good experience that has been exhibited in these uses; for several decades, the guardrail height in them has been no higher than 36 inches (914 mm).
- In commercial and industrial uses where the public is not invited (therefore, the guardrail is not subject to small children falling through), guardrails may have intermediate members spaced so that a 12-inch (305 mm) diameter sphere cannot pass through.
- In order to provide for proper viewing in theaters, a guardrail in front of the first row of fixed seats, and which is not at the end of an aisle, may be 26 inches (660 mm) in height.
- Again for obvious reasons, guardrails are not required on the auditorium side of a stage or enclosed platform.



1020.2 Vestibule: Where an *exit* discharges into an interior vestibule, the vestibule shall be used for ingress and *means of egress* only, and the vestibule shall comply with Sections 1020.2.1 and 1020.2.2.

1020.2.1 Depth and width: The vestibule depth from the exterior of the building shall not be greater than 10 feet (3048 mm) and the width shall not be greater than 20 feet (6096 mm).

1020.2.2 Separation: The vestibule shall be separated from the remainder of the *level of exit discharge* by self-closing doors and the equivalent of ¼-inch-thick wired glass in steel frames.

1020.3 Lobby: Where an *exit* discharges into an interior *lobby* located at the *level of exit discharge*, the story containing the *lobby* shall be equipped throughout with an *automatic sprinkler system* installed in accordance with Section 906.2.1 or 906.2.2. Opening protectives shall be required in accordance with Table 717.1 at the point in which an enclosed *exit stairway* discharges into a lobby.

Exception: An *automatic sprinkler system* is not required in areas that are separated from the *lobby* by *fire separation assemblies* (see Section 709.0) having a fireresistance rating of not less than that required for *exit* enclosures.

1020.4 Width and height: The clear width of the passageway shall not be less than the width required for the capacity of the *exit stairways* leading thereto and all required *exit* doorways opening into the passageway. Such passageway shall have a minimum width of 44 inches (1118 mm) and a minimum clear ceiling height of 8 feet (23438 mm).

1020.5 Maximum stairway limitations: Not more than 50 percent of the required *stairways* shall discharge through the same passageway. Multiple *lobbies* constructed in accordance with Section 1020.3 located adjacent to one another shall be separated from each other in accordance with the requirements for enclosure of *exits*.

SECTION 1021.0 GUARDS

1021.1 Design and construction: Where required by the provisions of Sections 406.5, 408.3.2, 1005.5, 1014.7, 1016.5 and 825.5, guards shall be designed and constructed in accordance with the requirements of this section and Section 1606.4.

1021.2 Height: The guards shall be at least 42 inches (1067 mm) in height measured vertically above the leading edge of the tread or adjacent walking surface.

Exceptions

1. In other than occupancies in Use Group E, guards shall not be less than 36 inches (914 mm) in height above the leading edge of the tread along stairs which are not more than 20 feet (6096 mm) in height or which reverse direction at an intermediate landing with 12 inches (305 mm) or less measured horizontally between successive flights.
2. Guards along open-sided floor areas, *mezzanines* and landings within a single *dwelling unit* in Use Group R-2 and serving a single *dwelling unit* in Use Group R-3 shall not be less than 36 inches (914 mm) in height.
3. Guards along open-sided floor areas located less than 30 inches (762 mm) above the floor or grade below shall not be less than 36 inches (914 mm) in height.

1021.3 Opening limitations: In occupancies in Use Groups A, B, E, H-4, I-1, I-2, M and R, and in *public garages* and open parking structures, open guards shall have balusters or be of solid material such that a sphere with a diameter of 4 inches (102 mm) cannot pass through any opening. Guards shall not have an ornamental pattern that would provide a ladder effect.

Exceptions

1. The triangular openings formed by the riser, tread and bottom rail at the open side of a *stairway* shall be of a maximum size such that a sphere 6 inches (152 mm) in diameter cannot pass through the opening.
2. At elevated walking surfaces for access to and utilization of electrical, mechanical, or plumbing systems or equipment, guards shall have balusters or be of solid materials such that a sphere with a diameter of 21 inches (533 mm) cannot pass through any opening.

In occupancies in Use Groups I-3, F, H-1, H-2, H-3, S, (other than *public garages* and open parking structures), and along open-sided floor areas located less than 30 inches (762 mm) above the floor or grade below, balusters, horizontal intermediate rails or other construction shall not permit a sphere with a diameter of 21 inches (533 mm) to pass through any opening.

1021.4 Railings: Metal or other approved noncombustible railings shall be provided on balconies and galleries as prescribed in Sections 1021.4.1 through 1021.4.3.

1021.4.1 At fascia: Railings shall be provided at the fascia of boxes, balconies and galleries and shall not be less than 26 inches (660 mm) in height; at the end of aisles extending to the fascia for the full width of the aisle and shall not be less than 36 inches (914 mm) in height; and at the foot of steps for the full width of the steps and shall not be less than 42 inches (1067 mm) in height.

1021.4.2 At cross aisles: Railings shall be provided along cross aisles, and shall not be less than 26 inches (660 mm) in height except that railings are not required where the backs of the seats along the front of the aisles project 24 inches (610 mm) or more above the floor of the aisle.

1021.4.3 Successive tiers: Where seatings are arranged in successive tiers, and where the height of rise between *platforms* exceeds 18 inches (457 mm), railings not less than 26 inches (660 mm) in height shall be provided along the entire row of seats at the edge of the *platform*.

SECTION 1022.0 HANDRAILS

1022.1 General: Where required by the provisions of Sections 1012.5, 1013.0, 1014.6.6.1, 1014.7 and 1016.5, handrails shall be designed and constructed in accordance with this section and Section 1606.4.

1022.2 Handrail details: Handrails shall be continuous, without interruption by newel posts, other structure elements or obstructions. A handrail and any wall or other surface adjacent to the handrail shall be free of any sharp or abrasive elements. The clear space between the handrail and the adjacent wall or surface shall

SECTION 502.0 DEFINITIONS

502.1 General: The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

Area, building: The *area* included within surrounding exterior walls (or exterior walls and *fire walls*) exclusive of vent *shafts* and *courts*. Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above.

Basement: That portion of a building which is partly or completely below grade (see "*Story above grade*").

Grade plane: A reference plane representing the average of finished ground level adjoining the building at all exterior walls. Where the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the *lot line* or, where the *lot line* is more than 6 feet (1829 mm) from the building, between the building and a point 6 feet (1829 mm) from the building.

Height

Building: The vertical distance from *grade plane* to the average height of the highest roof surface.

1005.5 Open-sided walking areas: Guards shall be located along open-sided walking surfaces, *mezzanines*, *stairways*, ramps and landings which are located more than 15½ inches (394 mm) above the floor or grade below. The guards shall be constructed in accordance with Section 1021.0.

Exception: Guards are not required for the following locations:

1. On the loading side of loading docks.
2. On the auditorium side of *stages* and raised *platforms*.
3. On raised *stage* and *platform* floor areas such as runways, ramps and side *stages* utilized for entertainment or presentations.
4. At vertical openings in the performance area of *stages* and *platforms*.
5. At elevated walking surfaces appurtenant to *stages* and *platforms* for access to and utilization of special lighting or equipment.

GALLERY-that portion of the seating space of an assembly room having a seating capacity of more than ten located above a balcony.

GRADE-a reference plane representing the average of finished ground level adjoining the building at all exterior walls. When the finished ground level slopes away from the exterior walls, the reference plane shall be established by the lowest points within the area between the building and the lot line or between the building and a point 6 ft (1829 mm) from the building, whichever is closer to the building.

GRADE LUMBER-the division of sawn lumber into quality classes with respect to its physical

SOUTHERN BUILDING CODE

1015 GUARDRAILS

1015.1 General

All unenclosed floor and roof openings, open and glazed sides of landings and ramps, balconies or porches which are more than 30 inches (762 mm) above finished ground level or a floor below shall be protected by a guardrail. Guardrails shall form a vertical protective barrier not less than 42 inches (1067 mm) high. Open guardrails shall have intermediate rails or ornamental pattern such that a 6-inch (152 mm) diameter sphere cannot pass through any opening. A bottom rail or curb shall be provided that will reject the passage of a 2-inch (51 mm) diameter sphere. Construction of guardrails shall be adequate in strength, durability and attachment for their purpose as described in 1608.2.

EXCEPTIONS:

1. Guardrails are not required on the loading side of loading docks.

2. Guardrails shall be permitted in conformance with requirements for specific occupancies in 1018.

1015.2 Glass

Cost Impact: None

RB143-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R312.1-RB-DAVIDSON

RB144 – 13
R312.1.1, Chapter 44

Proponent: Mitch Markham, representing Ascend Restoration Services

Revise as follows:

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.*

> **Exception:** Permanent fall arrest and restraint anchorage connector devices meeting ANSI/ASSE Z359.1 affixed for use during the entire roof covering lifetime shall be permitted where mechanical equipment, systems, devices and various components that require service are located on roof surfaces. Fall arrest/restraint devices shall be reevaluated for possible replacement when the entire roof covering is replaced. The devices shall be placed no more than 10 feet (3048 mm) on center along hip and ridge lines and placed not less than 10 feet (3048 mm) from the roof edge or open side of the walking surface.

Add new standards to Chapter 44 as follows:

ANSI American National Standards Institute
25 West 43rd Street, Fourth Floor
New York, NY 10036

Z359.1-07 Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

ASSE American Society of Sanitary Engineering
901 Canterbury, Suite A
Westlake, OH 44145

Z359.1-2007 Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components

Reason: This proposal is intended to correlate with E108-12 which was approved at the 2012 FAH as a consent agenda item during the code Group A process. This proposal is needed so there is consistency and correlation between the ICC codes. E108-12 added clarity to IBC sections 1013.6 and 1013.7, IFC sections 1013.6 and 1013.7, and IMC section 304.11. The existing code provisions requiring the construction of guards do not adequately address the expanding list of equipment, assemblies, systems, devices and items that are now commonly being placed on roof tops and elevated walking surfaces that require routine maintenance. The current requirement needs clarification and a cost effective alternative to constructing a guard on a roof since a guard is a method of fall protection required at the edge of elevated surfaces where people will walk and will provide service to roof-located equipment and other systems or devices. The code change proposal adds clarity to the current code language by identifying items within the exception that are now typical placements on roofs and elevated walking surfaces. This expands the fall protection, life-safety provisions to a growing number of trades and service workers that are working on elevated surfaces. The proposal also provides an alternate method of compliance with the inclusion of an exception which allows for the installation of fall arrest/restraint anchorage connector devices meeting ANSI Z359.1 which is the nationally recognized consensus general industry standard in use across the country. The proposed exception is a choice made by the designer and building owner that provides design flexibility and the opportunity to lower construction cost associated with building guards. The proposal will increase the uniform application of this section of the code. The Bureau of Labor Statistics, US Department of Labor reports the fatalities due to falls for the years from 1998 to 2010 are second to only highway incidents, with an average of 743 fatalities each year over this 12 year period. Of the 635 fatal falls in 2010, one third is from falls from ladders or roofs. In 2010 the construction industry had the highest number of fatal occupational injuries. In 2010 for nonfatal falls the median number of days away from work due to falls to a lower level was 14 days. Clearly the code needs to be improved to provide fall protection where mechanical equipment, appliances, equipment, fans, roof hatch openings, solar arrays, solar water heaters, photovoltaic panels, skylights, chimneys, attic vents, and ventilators, satellite dishes, antennas, television/radio/internet and other communication equipment and all other machinery and other components that require service are located on elevated surfaces more than 30 inches above a lover level.

Cost Impact: The code change proposal will not increase the cost of construction because the current code provisions can be interpreted to have the intent to require guards at all elevated working level more than 30 inches above a floor, roof or grade. The inclusion of an exception provides a choice to the builder and homeowner to lower the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, [ANSI/ASSE Z359.1-2007] with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2013.

RB144-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R312.1.1-RB-MARKHAM

RB145 – 13
R312.1.2

Proponent: Rick Davidson, City of Maple Grove, Association of Minnesota Building Officials (rdavidson@maplegrovemn.gov); Steve Thomas, Colorado Code Consulting, LLC representing the Colorado Chapter ICC (sthomas@coloradocode.net)

Revise as follows:

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~~, adjacent fixed seating~~ 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 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 the treads.

Reasons:
Davidson: This proposal deletes the term "adjacent fixed seating" from the rules on guards. The term "fixed seating" is not defined. This makes the intent ambiguous and unclear. This will result in a lack of uniformity. There is no evidence to suggest that this rule serves any purpose or that it corrects any problems. There was never any evidence submitted that there is a problem.

The intent of the current language could result in guards being five or six feet in height. Designing a guard to meet the load requirements at the top of such a guard will result in significant attachment concerns because the current load requirements were based on the assumption that the guard would only be 36 inches high and the code requires that the design load for guards be at the top. This code requirement is unreasonable because compliance with the rule will be extremely expensive yet provide little increase in safety over the previous rules.

Furthermore, it penalizes designs using fixed seating all the while ignoring chairs and other furniture than can be easily pushed next to a guard creating the same potential circumstances. If we really wanted to address a safety hazard, we would require self closing gates be installed across all stairways to prevent children from falling down stairs which is a much more frequent occurrence.

To avoid expensive and unintended design costs and to avoid confusion and a lack of uniformity of enforcement, this term must be deleted. It is reasonable to delete the term because the current language in the code has not been shown to cause unsafe conditions.

Thomas: This change is to delete the requirement to extend a guard 36 inches above the surface of fixed seating. The same requirement was deleted out of the 2012 IBC. Subsequent attempts to put it back in the 2015 IBC failed in Portland. This proposal will make the two codes consistent with each other in this area.

The original requirement was lumped in a larger change that was made to the guard provisions in the code. There was no technical justification to raise the height of the guard at the back of fixed seating. There was also no definition of what fixed seating is. This should never have been put in the IRC in the first place.

We feel that this requirement is over-restrictive. The responsibility of keeping children from climbing on the back of a deck bench or some type of landscape wall should not be placed on the code. At some point, parents need to be responsible for their children. Raising the height of the bench back rest to a height of 54 inches above the deck will not prevent children from climbing over and falling.

Cost Impacts :
Davidson: None
Thomas: This will reduce the cost of construction.

RB145-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R31.1.2-RB-DAVIDSON-THOMAS

RB146 – 13
R312.2.1

Proponent: Carl Baldassarra, P.E., FSFPE, Chair, ICC Code Technology Committee (cbaldassarra@rjagroup.com)

Revise as follows:

R312.2 Window fall protection. Window fall protection shall be provided in accordance with Sections R312.2.1 and R312.2.2.

R312.2.1 Window sills. In dwelling units, where ~~the opening of an operable window is located more than 72 inches (1829 mm) above the finished grade or surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4-inch-diameter (102 mm) sphere where such openings are located within 24 inches (610 mm) of the finished floor.~~ the top of the sill of an operable window opening is located less than 24 inches above the finished floor and greater than 72 inches (1829 mm) above the finished grade or other surface below on the exterior of the building, the operable window shall comply with one of the following:

~~Exceptions:~~

1. Operable windows whose openings will not allow a 4- inch-diameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. Operable windows ~~Openings~~ that are provided with window fall prevention devices that comply with ASTM F 2090.
3. Operable windows that are provided with window opening control devices that comply with Section R312.2.2.

Reason: This proposed change is a result of the CTC's investigation of the area of study entitled "Child Window Safety". The scope of the activity is noted as:

To evaluate the necessity of developing code proposals for the inclusion of requirements dealing with the conditions, circumstances and devices for window safety which could reduce the number of falls by children to surfaces below.

The purpose of this proposal is to coordinate the IRC with the changes approved to the IBC in the 2012 Group A cycle. Specifically, Code change E109-12 was approved as submitted to revise Section 1013.8 of the IBC (see below).

The CTC examined the IBC provisions during the preparation of the code changes for existing buildings and several questions came up regarding the original intent and the scope of what was being regulated. The IBC language was clarified to specify that the hazard exists with all windows in a dwelling unit and the height is to be measured to the top of the sill of an operable window. Additionally, , the exceptions aren't actually exceptions, but conditions where various devices and their standards are allowed to be used. It should be noted that the minimum sill height in the IBC is 36 inches and this proposal retains the current 24 inch minimum sill height in the IRC.

For reference, the approved IBC text is as follows:

> ***IBC 1013.8 Window openings.*** *All windows in Groups R-2 and R-3 buildings including dwellings units, where the top of the sill of an operable window opening is located less than 36 inches above the finished floor and greater than 72 inches (1829 mm) above the finished grade or other surface below on the exterior of the building, shall comply with one of the following:*
>
> 1. *Operable windows where the top of the sill of the opening is located more than 75 feet (22 860 mm) above the finished grade or other surface below and that are provided with window fall prevention devices that comply with ASTM F 2006.*
> 2. *Operable windows whose openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the window is in its largest opened position.*
> 3. *Operable windows whose openings that are provided with window fall prevention devices that comply with ASTM F 2090.*
> 4. *Operable windows that are provided with window opening control devices that comply with Section 1013.8.1.*
>
> ***1013.8.1 Window opening control devices.*** *Window opening control devices shall comply with ASTM F 2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section 1029.2.*

This proposal is submitted by the ICC Code Technology Committee. The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/CTC/Pages/default.aspx. Since its inception in April/2005, the CTC has held twenty-five meetings - all open to the public. In 2012, three of the 25 face-to face meetings were held. In addition to the CTC meetings, the CTC established Study Groups (SG) of interested parties for each of the areas of study. These SG's are responsible for reviewing the available information and making recommendations to the CTC. All totaled, the SG's held over 70 conference calls in 2012.

Cost Impact: This code change proposal will not increase the cost of construction.

RB146-13

Public Hearing:				
Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

R312.2.1-RB-BALDASSARRA-CTC

RB147 – 13
R312.2.1

Proponent: Rick Davidson, City of Maple Grove, Association of Minnesota Building Officials (rdavidson@maplegrovemn.gov)

Revise as follows:

R312.2 Window fall protection. Window fall protection shall be provided in accordance with Sections R312.2.1 and R312.2.2.

R312.2.1 Window sills. In dwelling units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished grade or surface below, the lowest part of the clear opening of the window shall be a minimum of ~~24~~ 36 inches (610 mm) above the finished floor of the room in which the window is located or above window seats or other adjacent fixed seating. Operable sections of windows shall not permit openings that allow passage of a 4-inch-diameter (102 mm) sphere where such openings are located within ~~24~~ 36 inches (610 mm) of the finished floor or above window seats or other adjacent fixed seating.

Exceptions:

1. Windows whose openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. Openings that are provided with window fall prevention devices that comply with ASTM F 2090.
3. Windows that are provided with window opening control devices that comply with Section R312.2.2.

Reason: It has been pointed out at recent hearings that the minimum sill height for child fall protection was set at 24 inches as a compromise. It is time to face reality and raise the sill height requirements to a justifiable level. This is a child safety issue and should be given a high priority. Children continue to fall out of windows resulting in serious injuries and deaths.

We require smoke alarms in bedrooms. The reason – adults smoke in bed and set themselves on fire.

We require Carbon Monoxide alarms in homes when the incidence of CO poisoning is rare. The reason – an adult might use their charcoal grill in their living room.

We require ramps to be flatter for single family dwellings than other buildings. The reason – adults need to be told what slope is best for them.

We require fire protection of floors in dwellings. The reason – fire fighters are entering buildings that have active fires below the floors of entry.

We require sprinklers in dwellings. The reason – smoking and cooking fires, the biggest cause of residential fires, occur because of inattention by adults.

We require large window wells for basement windows and then debate the need for guards to keep people from falling in them. We can't even agree on where guards should be placed or when they should be required to protect adults!

We have approved code changes to protect fire fighters, older people, younger people, smokers, and people who use charcoal grills in their living rooms. Yet children seem to be left out and when something is proposed to make things safer for children the events are said to be a parenting issue! Are the examples above also "parenting issues"? At least in my area of the country, it seems hardly a week goes by without the report of another child falling out of a window and being seriously injured or killed. And these events are occurring in single family homes. The fact of the matter is that children cannot be watched all of the time. Children falling out of windows is not a parenting issue, it is a poor design issue.

Guards are required to be not less than 36 inches in height and opening protection to prevent a 4 inch sphere from passing through the guard extends to the full height of the guard, not just the first 24 inches. The same should hold true for window openings because the risk is the same.

In the past you have heard a number of absurd arguments against proposals to increase sill heights and window fall protection in general. One argument is that a 24 inch sill height is safer than a 36 inch sill height because it is less likely that furniture will be placed in front of a window with a 24 inch sill. There have never been any scientific studies to support such a brainchild. And taken to an extreme, if 24 inches is safer than 36 inches, then 12 inches should be safer yet and if we really want to be safe we would mandate window openings start at the floor! Seriously, the studies that are out there contradict the claims that lower windows are safer. The vast majority of children fall out of windows with no furniture in front of them and that are located close to the floor. Toddlers are particularly susceptible and the lower sill heights act as a pivot for children of this age. Being top heavy, children simply leaning out a window can cause a fall. The average height of a two-year old is 31 inches. The average height of a four-year

old is 37 inches. It doesn't take a rocket scientist to see that children of these ages and these heights and lower window sill are a recipe for disaster and that is exactly what is happening.

There are numerous solutions available that would allow windows with to extend all the way to the floor if the designer wishes. And if the membership agrees to eliminate the need for emergency escape windows in sprinklered homes, that eliminates another concern.

Numerous requirements without substantiated need have been placed in the code in recent years that, at best, will provide limited benefit to a very small handful of individuals. Here we have an opportunity to provide increased levels of safety for children. This should be the proverbial "no-brainer".

Cost Impact: None

RB147-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R312.2.1-RB-DAVIDSON

RB261 – 13
R507.2.3

Proponent: Hoyt D Jeter, Eagle Eye Consulting Engineers, representing Washington Association of Building Officials Technical Code Development Committee (hoytjeter@centurytel.net)

Revise as follows:

R507.2.3 Deck lateral load connection. The lateral load connection required by Section R507.1 shall be permitted to be in accordance with Figure R507.2.3. Where the lateral load connection is provided in accordance with Figure 507.2.3, hold-down tension devices shall be installed in not less than two locations per deck, and each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N).

> **Exception:** Hold-down tension devices are not required for decks no more than 30 inches above grade at any point.

Reason: The requirement to provide lateral load connections for attached decks was introduced into the code to insure that live loads (usually resulting from human activity on the deck) will not cause failure of the deck ledger connection thereby allowing the deck to pull-away from the primary structure. Taken literally, all decks, even if they are 6" above grade, must be provided with lateral load connection devices (i.e. hold-downs). The exemption to install lateral load connection devices for decks 30" or less above grade was chosen because that is the same height at which the code currently exempts guardrails. The proposed exception does not exclude the requirement to adequately connect the deck ledger to the primary structure, as required elsewhere in the code.

Cost Impact: The code change proposal will decrease the cost of construction.

RB261-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R507.2.3 #2-JETER.doc

RB262 – 13

R507.2.3, Figure R507.2.3(2) (NEW)

Proponent: Hoyt Jeter, Eagle Eye Consulting Engineers, representing Washington Association of Building Officials Technical Code Development Committee (hoytjeter@centurytel.net)

Revise as follows:

R507.2.3 Deck lateral load connection. The lateral load connection required by Section R507.1 shall be permitted to be in accordance with Figures R507.2.3(1) or R507.2.3(2). Where the lateral load connection is provided in accordance with Figure 507.2.3(1), hold-down tension devices shall be installed in not less than two locations per deck, and each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N). Where the lateral load connections is provided in accordance with Figure R507.2.3(2), the hold-down tension devices shall be installed in not less than 4 locations per deck, and each device shall have an allowable stress design capacity of not less than 750 pounds (3336 N).

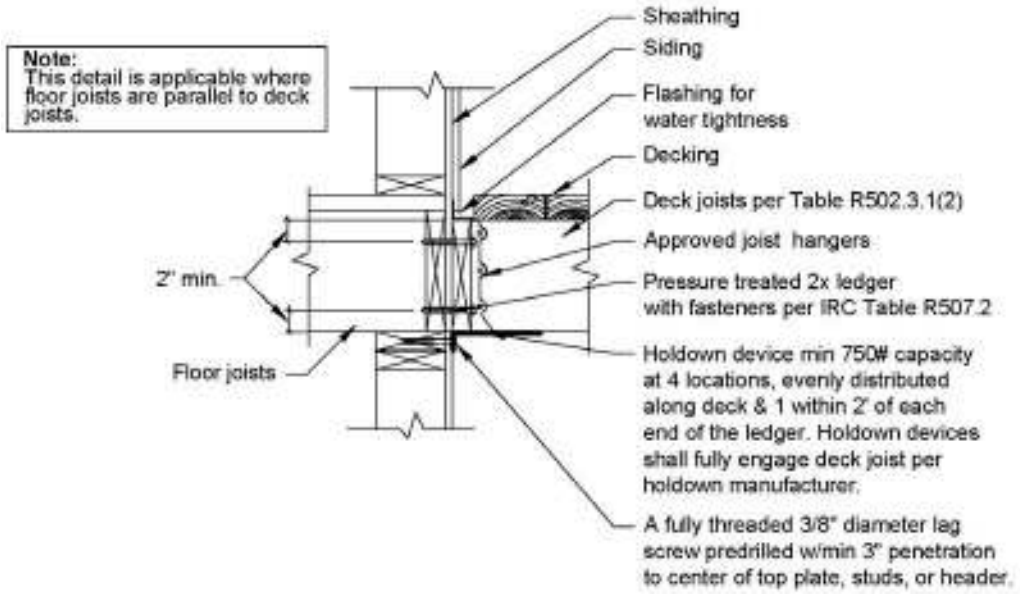


FIGURE R507.2.3(2)

Reason: This proposal provides an alternative prescriptive method to achieve an acceptable lateral load connection for residential decks. For new or replacement decks on existing homes, builders or homeowners must often remove interior sheet rock on ceilings in order to install hold-down tension devices as required by Figure 507.2.3. This proposal achieves an acceptable lateral load connection between the deck and primary structure by permitting the installation of surface mounted hold-down connection devices spread out along the length of the ledger and precludes the need to make expensive and unnecessary ceiling repairs.

Typical deck failures occur because joists separate from the joist-hangers which are fastened to the ledger. This is due to the lack of an adequate tension connection between the joist and the hanger at this joint. This proposal provides a better connection between at least 4 joists and the primary structure thereby reducing the potential failure of the joist to joist-hanger connection and better support form complete collapse of the deck and will reduce the chance of injury.

Cost Impact: The code change proposal will not increase the cost of construction, it will decrease the cost.

RB262-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R507.2.3 #3-JETER.doc

RB263 – 13
R507.1, R507.2.3, Figure R507.2.3

Proponent: Charles S. Bajnai, Chesterfield County, VA, representing ICC Building Code Action Committee and Virginia Building and Code Officials Association (bajnaic@chesterfield.gov)

Revise as follows:

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.

> **Exception:** Design for lateral loads, and connectors in accordance with Section R507.3, shall not be required for decks that do not require guards in accordance with Section R312.1.1, provided that the deck ledger is connected to the band joist in accordance with Section R507.2.

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 portion of the deck.

~~R507.2.3~~ R507.3 Deck lateral load connection. The lateral load connection required by Section R507.1 shall be permitted to be in accordance with Figure R507.~~2.~~3. Where the lateral load connection is provided in accordance with figure 507.~~2.~~3, hold-down tension devices shall be installed in not less than two locations per deck, and each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N).

FIGURE ~~507.2.3~~ 507.3
DECK ATTACHMENT FOR LATERAL LOADS

(Figure remains unchanged)

Reason: This proposal is submitted by the ICC Building Code Action Committee (BCAC) The BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance an assigned International Code or portion thereof. This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. Since its inception in July, 2011, the BCAC has held 6 open meetings and numerous workgroup calls which included members of the BCAC as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: http://www.iccsafe.org/cs/BCAC/Pages/default.aspx.

The provisions for deck design and attachment to the house have evolved in recent years. The IRC is now very strong on appropriate attachment to the main structure, as it should be. However, the specific provision in R507.1 that requires design for lateral loads, and the prescriptive hold-down tension connector alternative of R507.2.3, seem overly conservative for decks that are at grade, when these decks do not even require guardrails. For at-grade decks, the lag screw/bolt connections from deck ledger to band joist required by R507.2 are adequate. Elevated decks would still be required to be designed for lateral loads in accordance with R507.1 or the prescriptive hold-down tension devices specified in R507.2.3 (figure included below for convenience).

The renumbering of current Section R507.2.3 to R507.3 is necessary because current Section R507.2.3 serves as a prescriptive alternative to the requirement for design for lateral loads in R507.1. The purpose of the exception is to retain the requirement for ledger-to-band joist lags or bolts in current R507.2, R507.2.1, and R507.2.2, but exempt low decks from the prescriptive hold-down tension devices (or design for lateral load) in current section R507.2.3. Moving current R507.2.3 to its own section allows easier reference to the lag/screw connection requirements.

Cost Impact: The code change proposal could reduce the cost of construction. It could reduce the cost of construction.

RB263-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R507.1-RB-BAJNAI-BCAC.doc

RB266 – 13

R202, Table R301.5, R311.7.5.4, R311.7.8.1, R377.7.8.4, R312.1.4, R317.4, R317.4.1, R317.4.2, R318.1, R507.3, R507.3.1, R507.3.2 (NEW), R507.3.3 (NEW), R507.3.4 (NEW), R507.3.5 (NEW), R507.3.6 (NEW), Index

Proponent: Marcelo M Hirschler, GBH International (gbhint@aol.com)

Revise as follows:

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

USE	LIVE LOAD
~~Guardrails~~ Guards and handrails[d]	200[h]
~~Guardrail~~ Guard in-fill components[f]	50[h]

R311.7.5.4 Exterior ~~wood~~/plastic composite stair treads. ~~Wood/plastic~~ Plastic composite stair treads shall comply with the provisions of Section R507.3.

R311.7.8.1 Height. Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

Exceptions:

1. The use of a volute, turnout or starting easing shall be allowed over the lowest tread.
2. When handrail fittings or bendings are used to provide continuous transition between flights, transitions at winder treads, the transition from handrail to ~~guardrail~~ guard, or used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.

R311.7.8.4 Exterior ~~wood/plastic~~ plastic composite handrails. ~~Wood/plastic~~ Plastic composite exterior handrails shall comply with the ~~provisions~~ requirements of Section R507.3.

R312.1.4 Exterior ~~wood/plastic~~ plastic composite guards. ~~Wood/plastic~~ Plastic composite exterior guards shall comply with the ~~provisions~~ requirements of Section ~~R317.4~~ R507.3.

~~**R317.4 Wood/plastic composites.** Wood/plastic composites used in exterior deck boards, stair treads, handrails and guardrail systems shall bear a *label* indicating the required performance levels and demonstrating compliance with the provisions of ASTM D 7032.~~

R317.4 Plastic composites. Plastic composite exterior deck boards, stair treads, guards and handrails containing wood, cellulosic or other biodegradable materials shall comply with the provisions of Section R507.3.

~~**R317.4.1 Labeling.** Deck boards and stair treads shall bear a label that indicates compliance to ASTM D 7032 and includes the allowable load and maximum allowable span. Handrails and guardrail systems or their packaging shall bear a label that indicates compliance to ASTM D7032 and includes the maximum allowable span.~~

~~**R317.4.2 Installation.** Wood/plastic composites shall be installed in accordance with the manufacturer's instructions.~~

R318.1 Subterranean termite control methods. In areas subject to damage from termites as indicated by Table R301.2(1), methods of protection shall be one of the following methods or a combination of these methods:

1. Chemical termiticide treatment, as provided in Section R318.2.
2. Termite baiting system installed and maintained according to the *label*.
3. Pressure-preservative-treated wood in accordance with the provisions of Section R317.1.
4. Naturally durable termite-resistant wood.
5. Physical barriers as provided in Section R318.3 and used in locations as specified in Section R317.1.
6. Cold-formed steel framing in accordance with Sections R505.2.1 and R603.2.1.
7. Plastic composite exterior deck boards, stair treads, guards and handrails in accordance with the provisions of Section R507.3.

Revise as follows:

R507
EXTERIOR DECKS

~~**R507.3 Wood/plastic composites.** Wood/plastic composites used in exterior deck boards, stair treads, handrails and guardrail systems shall bear a label indicating the required performance levels and demonstrating compliance with the provisions of ASTM D 7032.~~

R507.3 Plastic composite deck boards, stair treads, guards and handrails. Plastic composite deck boards, stair treads, guards and hand rails shall comply with Section R507.3.1 through R507.3.6.

~~**R507.3.1 Installation of wood/plastic composites.** Wood/plastic composites shall be installed in accordance with the manufacturer's instructions.~~

R507.3.1 General. Plastic composites shall consist either of wood/plastic composites or of plastic lumber. Plastic composite exterior deck boards, stair treads, guards and handrails shall comply with the requirements of ASTM D7032 and with the additional requirements of Section R507.3.

R507.3.2 Labeling. Plastic composite deck boards and stair treads, or their packaging, shall bear a *label* that indicates compliance with ASTM D7032 and includes the allowable load and maximum allowable span, determined in accordance with ASTM D7032. Plastic composite handrails and guards, or their packaging, shall bear a *label* that indicates compliance with ASTM D7032 and includes the allowable load and maximum allowable span, determined in accordance with ASTM D7032.

R507.3.3 Flame Spread Index. Plastic composite deck boards, stair treads, guards and handrails shall exhibit a flame spread index not exceeding 200 when tested in accordance with ASTM E84 or UL 723 with the test specimen remaining in place during the test.

Exception: Plastic composites determined to be noncombustible.

R507.3.4 Decay resistance. Plastic composite deck boards, stair treads, guards and handrails containing wood, cellulosic or other biodegradable materials shall be termite and decay resistant in accordance with ASTM D7032.

R507.3.5 Termite resistance. Where required by Section 318, plastic composite deck boards, stair treads, guards and handrails containing wood, cellulosic or other biodegradable materials shall be termite resistant in accordance with ASTM D7032.

R507.3.6 Installation of plastic composites. Plastic composite deck boards, stair treads, guards and handrails shall be installed in accordance with this code and the manufacturers' instructions.

Revise as follows:

PLASTIC COMPOSITE. A generic designation that refers to wood/plastic composites and plastic lumber.

~~**WOOD/PLASTIC COMPOSITE.** A composite material made primarily from wood or cellulose-based materials and plastic.~~

Revise Index as follows:

~~**Guardrails**~~ **Guards** **312**

Reason: This proposal recommends permitting the use of plastic composites for exterior applications as deck boards, stair treads, handrails and guards. The term "plastic composites" is a designation that was accepted by the IBC to incorporate wood/plastic composites and plastic lumber.

Both plastic composites and plastic lumber are products are made of plastic materials with added fibrous materials to provide stiffness. There are some differences between the two, but they are relatively subtle. Wood plastic composites contain wood materials, or cellulosic materials, (normally over 50%) as the primary fiber that provides the stiffness. On the other hand plastic lumber materials contain primarily plastic (normally over 50%) and use a variety of materials to provide stiffness, often fiberglass. Acceptance Criteria AC 174, Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems (Guards and Handrails) is used for both types of materials and it requires compliance with requirements in specification ASTM D7032, Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails), presently referenced in the IBC, the IRC and in the IWUIC.

Numerous plastic lumber decks are used throughout the US, but the IRC does not reference them. The IBC 2015 will reference plastic composite deck boards, stair treads, handrails and guards and the requirements are similar to those proposed here and the language is also consistent.

Flame spread index: wood materials normally comply with a flame spread index of no more than 200. ASTM D7032 also requires materials to comply with a flame spread index of no more than 200 when tested to ASTM E84. However, it does not have the additional requirements that the material stay in place, which is important for plastic materials and was adopted by the IBC.

The reasons for the specific requirements in the proposal are as follows:

1. The language is changed from wood/plastic composites to plastic composites.
2. All of the requirements are incorporated into section R507 (on decks) and specifically into section R507.3.
3. The requirements are technically identical to those in the IBC.
4. A definition for plastic composite is added to section 202 and the definition of wood/plastic composite, which is now no longer necessary and would cause confusion, is deleted from Section 202.
5. The information on labeling is redundant in R317 and it is being deleted as it is included in R507.3 and R317.4 sends the user to R507.3 for requirements.
6. A new subsection for plastic composites is being added to R318.1 to deal with termites.
7. The designation "guardrail" is being replaced by "guard" throughout.

For information purposes, the new section on plastic composites in the IBC reads as follows:

IBC SECTION 2612 - PLASTIC COMPOSITES

2612.1 General. *Plastic composites shall consist either of wood/plastic composites or of plastic lumber. Plastic composites shall comply with the provisions of this code and with the additional requirements of Section 2612.*

2612.2 Labeling and identification. *Packages and containers of plastic composites used in exterior applications shall bear a label showing the manufacturer's name, product identification and information sufficient to determine that the end use will comply with the code requirements.*

2612.2.1 *The label for plastic composites used in exterior applications as deck boards, stair treads, handrails and guardrail systems shall indicate the required performance levels and demonstrate compliance with the provisions of ASTM D7032.*

2612.2.2 Loading. *The label for plastic composites used in exterior applications as deck boards, stair treads, handrails and guardrail systems shall indicate the type and magnitude of the load determined in accordance with ASTM D7032.*

2612.3 Flame Spread Index. *Plastic composites shall exhibit a flame spread index not exceeding 200 when tested in accordance with ASTM E84 or UL 723 with the test specimen remaining in place during the test.*

Exception: *materials determined to be noncombustible in accordance with Section 703.5.*

2612.4 Termite and Decay resistance*. Plastic composites containing wood, cellulosic or other biodegradable materials shall be termite and decay resistant as determined in accordance with ASTM D7032.*

2612.5 Construction requirements. *Plastic composites shall be permitted to be used as exterior deck boards, stair treads, handrails and guardrail systems in buildings of Class VB construction.*

2612.5.1 Span rating. *Plastic composites used as exterior deck boards shall have a span rating determined in accordance with ASTM D7032.*

2612.5.3 Handrails and Guards*. Plastic composite handrail systems shall comply with Section 1012. Plastic composite guardrail*

systems shall comply with Section 1013.

2612.6 Plastic composite decking, handrails, and guards. *Plastic composite decking, handrails, and guardrail systems shall be installed in accordance with this code and the manufacturers' instructions.*

Cost Impact: This code change proposal will not increase the cost of construction.

RB266-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R507-RB-HIRSCHLER.doc

RB267 – 13

R202, Table R301.5, R311.7.5.4, R311.7.8.1, R311.7.8.4, R312.1.4, R317.4, R317.4.1, R317.4.2, R318.1, R507, R507.3, R507.3.1, R507.3.2 (NEW), R507.3.3 (NEW), R507.3.4 (NEW), R507.3.5 (NEW), INDEX B

Proponent: John Woestman, Kellen Company, representing Composite Lumber Manufacturers Association (CLMA) (jwoestman@kellencompany.com)

Revise as follows:

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

USE	LIVE LOAD
Uninhabitable attics without storage[b]	10
Uninhabitable attics with limited storage[b, g]	20
Habitable attics and attics served with fixed stairs	30
Balconies (exterior) and decks[e]	40
Fire escapes	40
~~Guardrails~~ Guards and handrails[d]	200[h]
~~Guardrail~~ Guard in-fill components[f]	50[h]
Passenger vehicle garages[a]	50[a]
Rooms other than sleeping room	40
Sleeping rooms	30
Stairs	40[c]

For SI: 1 pound per square foot = 0.0479 kPa, 1 square inch = 645 mm^2, 1 pound = 4.45 N.

a. Elevated garage floors shall be capable of supporting a 2,000-pound load applied over a 20-square-inch area.

b. Uninhabitable attics without storage are those where the maximum clear height between joists and rafters is less than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches high by 24 inches in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirements.

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.

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

e. See Section R502.2.2 for decks attached to exterior walls.

f. Guard in-fill components (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot. This load need not be assumed to act concurrently with any other live load requirement.

g. Uninhabitable attics with limited storage are those where the maximum clear height between joists and rafters is 42 inches or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses.

The live load need only be applied to those portions of the joists or truss bottom chords where all of the following conditions are met:

1. The attic area is accessible from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the attic is a minimum of 30 inches.

2. The slopes of the joists or truss bottom chords are no greater than 2 inches vertical to 12 units horizontal.
3. Required insulation depth is less than the joist or truss bottom chord member depth.

The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed concurrent live load of not less than 10 lb/ft^2.

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 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.

Revise definitions as follows:

PLASTIC COMPOSITE. A generic designation that refers to wood/plastic composites and plastic lumber.

~~**WOOD/PLASTIC COMPOSITE.** A composite material made primarily from wood or cellulose-based materials and plastic.~~

Revise as follows:

R311.7.5.4 Exterior ~~wood~~/plastic composite stair treads. ~~Wood/plastic~~ Plastic composite exterior stair treads shall comply with the ~~provisions~~ requirements of this section and Section R507.3.

R311.7.8.1 Height. Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

Exceptions:

1. The use of a volute, turnout or starting easing shall be allowed over the lowest tread.
2. When handrail fittings or bendings are used to provide continuous transition between flights, transitions at winder treads, the transition from handrail to ~~guardrail~~ guard, or used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.

R311.7.8.4 Exterior ~~wood~~/plastic composite handrails. ~~Wood/plastic~~ Plastic composite exterior handrails shall comply with the ~~provisions~~ requirements of Section R507.3.

R312.1.4 Exterior ~~wood~~plastic composite guards. ~~Woodplastic~~ Plastic composite exterior *guards* shall comply with the ~~provisions~~ requirements of ~~Section R317.4~~ Section R507.3.

~~**R317.4 Wood/plastic composites.** Wood/plastic composites used in exterior deck boards, stair treads, handrails and guardrail systems shall bear a *label* indicating the required performance levels and demonstrating compliance with the provisions of ASTM D 7032.~~

~~**R317.4.1 Labeling.** Deck boards and stair treads shall bear a label that indicates compliance to ASTM D 7032 and includes the allowable load and maximum allowable span. Handrails and guardrail systems or their packaging shall bear a label that indicates compliance to ASTM D 7032 and includes the maximum allowable span.~~

~~**R317.4.2 Installation.** Wood/plastic composites shall be installed in accordance with the manufacturer's instructions.~~

R317.4 Plastic composites. Plastic composite exterior deck boards, stair treads, guards, and handrails containing wood, cellulosic or other biodegradable materials shall comply with the requirements of Section R507.3.

R318.1 Subterranean termite control methods. In areas subject to damage from termites as indicated by Table R301.2(1), methods of protection shall be one of the following methods or a combination of these methods:

1. Chemical termiticide treatment, as provided in Section R318.2.

2. Termite baiting system installed and maintained according to the *label*.
3. Pressure-preservative-treated wood in accordance with the provisions of Section R317.1.
4. Naturally durable termite-resistant wood.
5. Physical barriers as provided in Section R318.3 and used in locations as specified in Section R317.1.
6. Cold-formed steel framing in accordance with Sections R505.2.1 and R603.2.1.
7. Plastic composite exterior deck boards, stair treads, guards, and handrails in accordance with the provisions of Section 507.3.4.

Revise as follows:

SECTION R507
EXTERIOR DECKS

~~**R507.3 Wood/plastic composites.** Wood/plastic composites used in exterior deck boards, stair treads, handrails and guardrail systems shall bear a label indicating the required performance levels and demonstrating compliance with the provisions of ASTM D 7032.~~

~~**R507.3.1 Installation of wood/plastic composites.** Wood/plastic composites shall be installed in accordance with the manufacturer's instructions.~~

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 D7032 and the requirements of Section 507.3.

R507.3.1 Labeling. Plastic composite deck boards and stair treads, or their packaging, shall bear a label that indicates compliance to ASTM D7032 and includes the allowable load and maximum allowable span determined in accordance with ASTM D7032. Plastic or composite handrails and guards, or their packaging, shall bear a label that indicates compliance to ASTM D7032 and includes the maximum allowable span determined in accordance with ASTM D7032.

R507.3.2 Flame Spread Index. Plastic composites deck boards, stair treads, guards, and handrails shall exhibit a flame spread index not exceeding 200 when tested in accordance with ASTM E84 or UL 723 with the test specimen remaining in place during the test.

Exception: Plastic composites determined to be noncombustible.

R507.3.3 Decay resistance. Plastic composite deck boards, stair treads, guards, and handrails, containing wood, cellulosic, or other biodegradable materials shall be decay resistant in accordance with ASTM D7032.

R507.3.4 Termite resistance. Where required by Section 318, plastic composite deck boards, stair treads, guards, and handrails containing wood, cellulosic, or other biodegradable materials shall be termite resistant in accordance with ASTM D7032.

507.3.5 Installation of plastic composites. Plastic composite deck boards, stair treads, guards, and handrails shall be installed in accordance with this code and the manufacturer's instructions.

Revise as follows:

INDEX

B

Building Planning

~~Guardrails~~Guards. . . . . R312 (update index editorially)

Reason: This code proposal focuses on plastic composite (i.e. wood /plastic composite or plastic lumber) exterior deck boards, stair treads, guards, and handrails. This proposal:

1. In Section R507.3, incorporates the technical revisions approved for the 2015 IBC for plastic composite exterior deck boards, stair treads, guards, and handrails with text revised to be more clear and concise.
2. Revises the name of the Section 507 to Exterior Decks to help make it clear these requirements apply to exterior construction.
3. Updates / revises pointers in the IRC that point to Section R507.3.
4. Adds a pointer for termite resistance in Section R318.1.
5. Revises all guardrail / guardrails references to guard / guards for consistency of the IRC, and consistency to the IBC.
6. Proposes a definition for "plastic composites" which includes wood / plastic composites and plastic lumber. Deletes the definition of wood / plastic composites as the term is self-explanatory, especially in the context of exterior deck boards, stair treads, guards, and handrails.
7. In R317, refers to requirements in R507.3 and deletes un-needed text.
8. Editorially replaces the word "provisions" with "requirements" as "requirements" seems to convey stronger mandatory actions than "provisions".

ASTM D7032 is currently referenced in R507.3, and this proposal expands specific references to D7032, and expands the scope of materials required to comply with D7032. In addition to requirements in the IRC applicable to deck boards, stair treads, guards, and handrails, D7032 has become the standard to which these plastic lumber and wood /plastic composite exterior deck boards, stair treads, guards, and handrails are tested to evaluate and verify compliance to code requirements.

ASTM D7032 includes deck-related performance evaluations and performance requirements such as flexural tests, bio-degradation tests, fire performance tests, creep recovery tests, mechanical fastener holding tests, and slip resistance tests. The standard also includes consideration of the effects of temperature, moisture, concentrated loads, freeze-thaw resistance tests, UV resistance, and duration of load on deck boards, stair treads, guards, and handrails.

There should be no cost increase to construction as these products comply with these requirements through ICC ES AC174. There may be a slight reduction in the cost of construction as these changes to the IRC are expected to help clarify code requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

RB267-13

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

R301.5T-RB-WOESTMAN.doc

RB268 – 13
R507 (NEW)

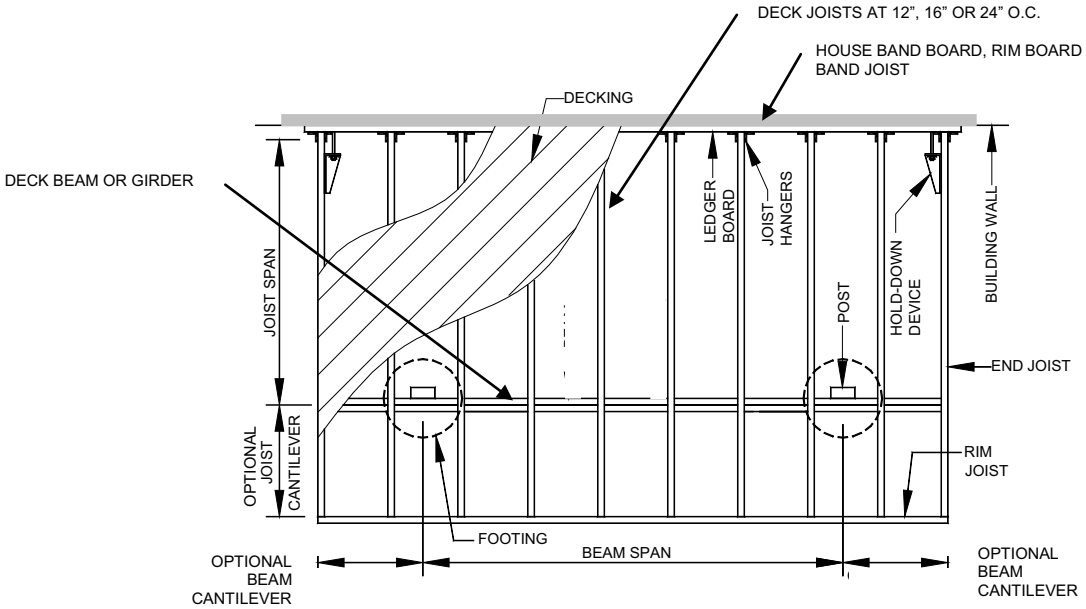
Proponent: Charles S. Bajnai, Chesterfield County, VA, representing self (bajnaic@chesterfield.gov), Randy Shackelford, Simpson Strong Tie (rshackelford@strongtie.com)

Add new text as follows:

SECTION R507
DECKS

R507.1 Wood decks. Typical wood decks shall be designed and constructed in accordance with this section. Other grades, species, loading, materials and conditions not described herein shall be permitted in accordance with Section 301. Loading for large concentrated loads, such as hot tubs, is beyond the scope of this section.

R507.2 Requirements. Deck construction shall be capable of accommodating applied loads and transmitting them to the supporting structural elements. Figure R507.2 is intended for purposes of identifying typical parts, and not to limit the design.



For SI: 1 inch = 25.4 mm

FIGURE R507.2
DECK CONSTRUCTION

R507.3 Materials. Materials used in the construction of a deck shall comply with the provisions of this section.

R507.3.1 Preservative-treated lumber. All lumber for decks shall be either naturally durable, minimum No.2 grade dimension lumber and identified in accordance with Section R502.1 or, preservative-treated in accordance with Section R317. All lumber in contact with the ground shall be identified as suitable for ground contact.

R507.3.2 Wood Decking. Wood decking shall comply with any of the following materials:

1. Wood decking with a minimum nominal thickness of 1 $^{1}/_{4}$ inches (32 mm) shall be installed at 90 degrees to deck joists that are spaced at a maximum of 16 inches (406 mm) on center and up to 45 degrees when spaced at a maximum of 12 inches (305 mm) on center.
2. Wood decking with a nominal 2 inch (51 mm) thickness shall be installed at an angle between 45 and 90 degrees to deck joists that are spaced at a maximum of 24 inches (610 mm) on center.
3. Wood decking shall be attached to each supporting member with a minimum of (2)8d threaded nails or (2)#8 wood screws.

R507.3.3 Wood/plastic composites. Wood/plastic composites used as exterior deck boards, stair treads, handrails and guardrail systems shall be permitted in accordance with manufacturer's instructions.

R507.3.4 Metal guardrail systems. Metal guardrail and handrail systems shall be permitted in accordance with the manufacturer's instructions.

R507.3.5 Fasteners and connectors. Nails, bolts with nuts and washers, screws and connectors shall be coated in accordance with Section R317.3. Proprietary fasteners shall be permitted provided they are compatible with the pressure-preservative-treated lumber being used. Fasteners and connectors within 300 feet of salt water shoreline shall be stainless steel.

R507.3.6 Flashing. Flashing shall be corrosion-resistant metal of minimum nominal 0.019 inch (0.5 mm) thickness or approved non-metallic material.

R507.4 Deck joists. Spans for typical wood deck joist configurations, as shown in Figure R507.4, shall be in accordance with Table R507.4. Deck joists shall be permitted to cantilever a maximum of one-fourth of the joist span.

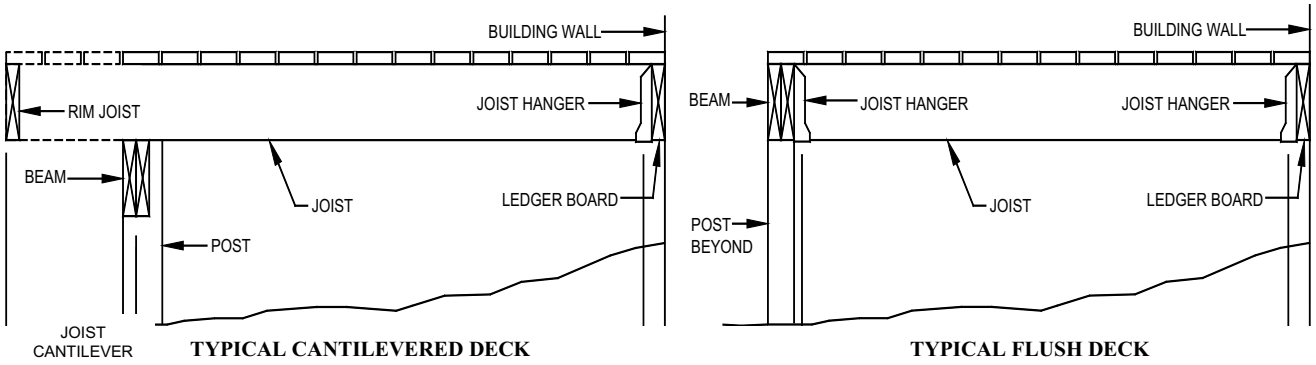
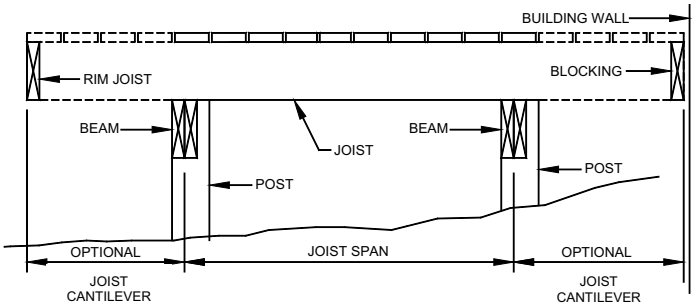


FIGURE R507.4



TYPICAL FREE STANDING DECK

TABLE R507.4
MAXIMUM DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft.-in.)

SPECIES [a]	SIZE	MAXIMUM SPACING OF DECK JOISTS WITH NO CANTILEVER [b] (in.)			MAXIMUM SPACING OF DECK JOISTS WITH CANTILEVERS [c] (in.)		
		12	16	24	12	16	24
Southern pine	2 x 6	10-4	9-5	7-10	7-1	7-1	7-1
	2 x 8	13-8	12–5	10–2	10-9	10-9	10-2
	2 x 10	17-5	15–10	13–1	15-6	15-6	13-1
	2 x 12	18-0	18–0	15-5	18-0	18-0	15-5
Douglas fir-larch[d], hem-fir[d] spruce-pine-fir[d]	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[e], red pine[e]	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 SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. No. 2 grade with wet service factor.
b. Deck joists shall be designed to carry the deck live load in Table R301.5 or the ground snow load, which ever is greater. This table is based on ground snow load or live load = 40 psf, dead load = 10 psf, L/Δ = 360.
c. Deck joists shall be designed to carry the deck live load in Table R301.5 or the ground snow load, which ever is greater. This table is based on ground snow load or 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

R507.4.1 Joist bearing. Joist ends shall be provided with vertical and rotational support. The ends of joists shall have a minimum of 1.5 inches (38 mm) of bearing on a wood ledger board or on metal hangers. Where rotational support is provided by joist hangers or blocking between joists, their depth shall equal not less than 60 percent of the joist depth. Where rotational support is provided by rim joists, they shall be secured to the end of each joist with a minimum of (3)10d threaded nails or (3)#10x3 inch (76 mm) long wood screws. For free-standing decks, rotational support of the joist ends adjacent to the building wall shall be permitted by a rim joist or full depth nominal 2x blocking toe nailed at each end with (3)10d nails.

R507.5 Deck Beams. The maximum span for deck beams, as shown in Figure R507.2, shall be in accordance Table R507.5. Beams shall be permitted to cantilever at each end up to one-fourth of the beam span. The plies of a multi-ply beam shall be fastened with a minimum of two rows of 10d threaded nails at 16 inches (406 mm) on center along each edge. Splices of multi-span beams shall be located at interior post locations.

TABLE R507.5
MAXIMUM BEAM SPAN LENGTHS [a]

SPECIES	SIZE [b]	MAIN JOIST SPAN (ft.) LESS THAN OR EQUAL TO:						
		6	8	10	12	14	16	18
Southern pine	2-2x6	7-1	6-2	5-6	5-0	4-8	4-4	4-1
	2-2x8	9-2	7-11	7-1	6-6	6-0	5-7	5-3
	2-2x10	11-10	10-3	9-2	8-5	7-9	7-3	6-10
	2-2x12	13-11	12-0	10-9	9-10	9-1	8-6	8-0
	3-2x6	8-7	7-8	6-11	6-3	5-10	5-5	5-2
	3-2x8	11-4	9-11	8-11	8-1	7-6	7-0	6-7
	3-2x10	14-5	12-10	11-6	10-6	9-9	9-1	8-7

	3-2x12	17-5	15-1	13-6	12-4	11-5	10-8	10-1
Douglas fir-larch [c], spruce-pine-fir, redwood [c], western cedars, ponderosa pine [d], red pine [d]	3x6 or2-2x6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3x8 or 2-2x8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3x10 or 2-2x10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3x12 or 2-2x12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4x6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4x8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4x10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4x12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3-2x6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3-2x8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3-2x10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3-2x12	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.

a. Deck beams shall be designed to carry the deck live load in Table R301.5 or the ground snow load, which ever is greater. This table is based on ground snow load or 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 .No 2 grade, wet service factor.

b. Beam depth shall be greater than or equal to depth of joists with a flush beam condition.

c. Includes incising factor.

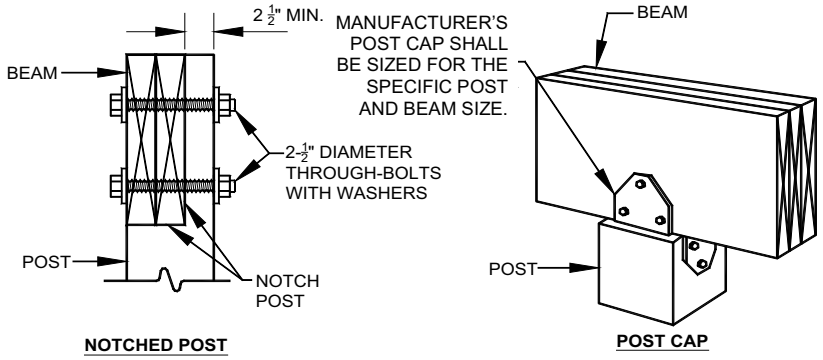
d. Northern species with no incising factor.

R507.5.1 Beam bearing. Single-ply beams and multi-ply beams shall have all of their bearing directly on wood posts or on an approved metal post cap in accordance with Figure R507.6.1 and not less than 3 inches (76 mm) on concrete or masonry.

R507.6 Deck posts. For typical single level wood decks, posts shall be measured from the top of the footing to the underside of the beam. The maximum height of the post shall be in accordance with the following:

1. Posts comprised of a minimum nominal 4x4 shall be permitted to a maximum height of 8 feet (2438 mm),
2. Posts comprised of a minimum nominal 6x6 shall be permitted to a maximum height of 14 feet (5486 mm).
3. Posts comprised of southern pine, of 4x4 or 4x6, grade #2 shall be permitted to a maximum height of 10 feet (3048 mm).
4. Posts comprised of southern pine, of 6x6 shall be permitted to a maximum height of 18 feet (5486 mm).

R507.6.1 Deck post to deck beam connection. Deck beams shall be attached to deck posts in accordance with Figure R507.6.1. Post to beam connections shall be constructed 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.



For SI: 1 inch = 25.4 mm

FIGURE R507.6.1
TYPICAL BEAM BEARING

R507.7 Deck footings. Deck footings shall be constructed in accordance with Section R403 and Figure R507.7. The size of the footing shall be adequate for the load applied by the posts.

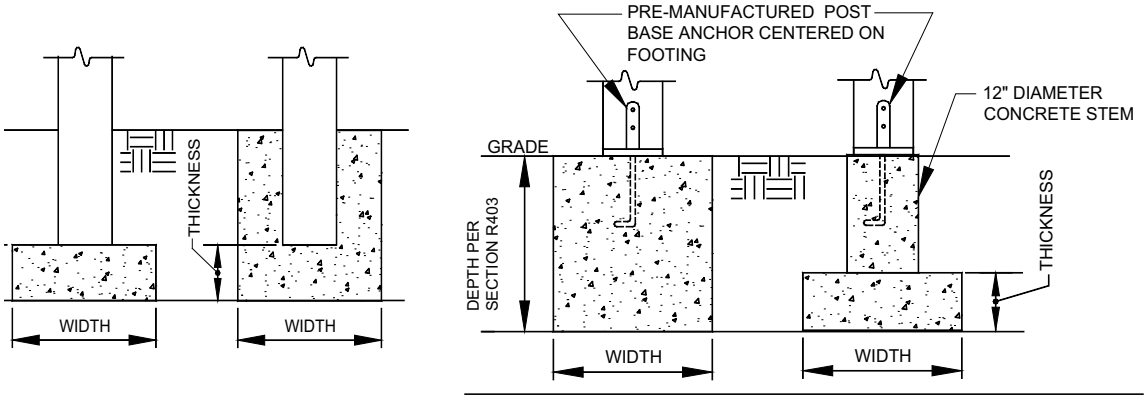


FIGURE R507.7
TYPICAL DECK FOOTINGS

R507.7.1 Footing depth. The minimum depth of footings shall be in accordance with Section R403.1.4 or as approved by the building official. A deck footing within 4 feet of the house shall be sit at least to the depth of the house footing.

R507.7.2 Post connection to footing. Where the top of the footings are at or above grade, the posts shall be prevented from being displaced by a connector between the post and the concrete. Where the top of the footings are below grade the post shall be permitted to sit on top of the footing or may be embedded in the concrete.

R507.8 Deck ledger connection to the building.. The connection between a deck ledger and the building shall be in accordance with this section.

R507.8.1 Deck ledger connection to band joist. The deck ledger shall be connected to a 2-inch nominal lumber band joist with ½-inch lag screws or bolts with washers in accordance with Table R507.8.1 and Figure R507.8.1(1). The bolts or lag screws shall be spaced in accordance with Figure R507.8.1(2). As an alternative to the detail in Figure R507.8.1, the ledger boards shall be permitted to be offset from the band joist a maximum distance of ½ inch (13 mm) with the installation of stacked washers. The exterior wall finish shall be removed prior to installation of the ledger board. Flashing at a door threshold shall be installed to prevent water intrusion from rain or melting ice and snow.

R507.8.2 Deck ledger connection to concrete foundation walls. A ledger board shall be connected to a concrete or solid masonry foundation wall with approved ½ inch (13 mm) diameter expansion anchors at a spacing specified in Table R507.8.1(1) and as shown in Figure R507.8.2. Expansion anchors shall be installed per the manufacturer.

R507.8.3 Ledger board to hollow masonry foundation wall. A ledger board shall be connected to a hollow masonry foundation wall with approved ½ inch (13 mm) diameter epoxy anchors at a spacing

specified in Table R507.8.1(1) and as shown in Figure R507.8.3. Epoxy anchors shall be installed per the manufacturer.

R507.8.4 Alternate connections. An approved engineered wood rim board with a minimum thickness of 1 inch (25 mm) shall be permitted to substitute for a 2x lumber band joist provided it was designed and manufactured to support a deck. A ledger board attachment to a masonry or stone veneer, ribbon board of open web floor trusses, band joist of a cantilevered floor and other conditions not addressed herein shall be designed in accordance with accepted engineering practice, or the deck shall be free-standing in accordance with Section R507.10.

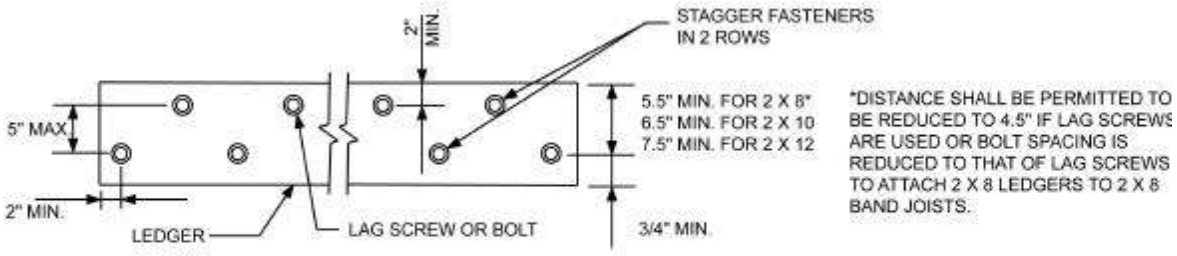
TABLE R507.8.1(1)
FASTENER SPACING

FASTENER	BAND BOARD	JOIST SPAN						
		≤6'	> 6'-8'	> 8'-10'	> 10'-12'	> 12'-14'	> 14'-16'	> 16'-18'
½" lag screws [a]	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	30"	23"	18"	15"	13"	11"	10"
½" through bolts	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	36"	36"	34"	29"	24"	21"	19"
½" through bolts and ½" stacked washers [b]	1" min. engineered wood product	24"	18"	14"	12"	10"	9"	8"
	2x lumber	36"	36"	29"	24"	21"	18"	16"
Expansion anchors	-	36"	36"	34"	29"	24"	21"	19"
Epoxy anchors	-	32"	32"	32"	24"	24"	16"	16"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

a. The tip of the lag screw shall fully extend beyond the inside face of the band board.

b. The maximum gap between the face of the ledger board and face of the wall sheathing shall be ½ inches (13 mm).



For SI: 1 inch = 25.4 mm.

FIGURE R507.8.1(1)
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS

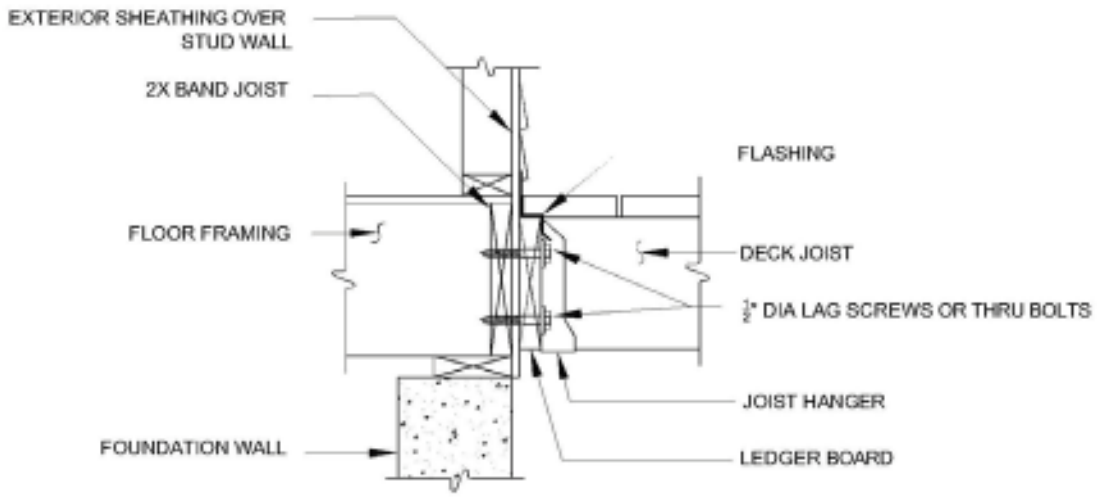


FIGURE R507.8.1(2)
LEDGER BOARD TO BAND BOARD ATTACHMENT

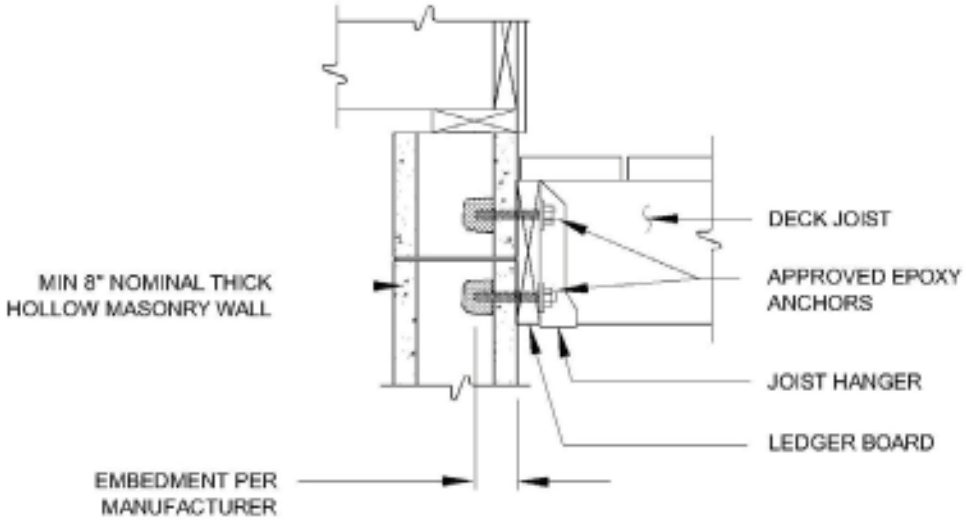


FIGURE R507.8.2
LEDGER BOARD TO SOLID FOUNDATION WALL ATTACHMENT

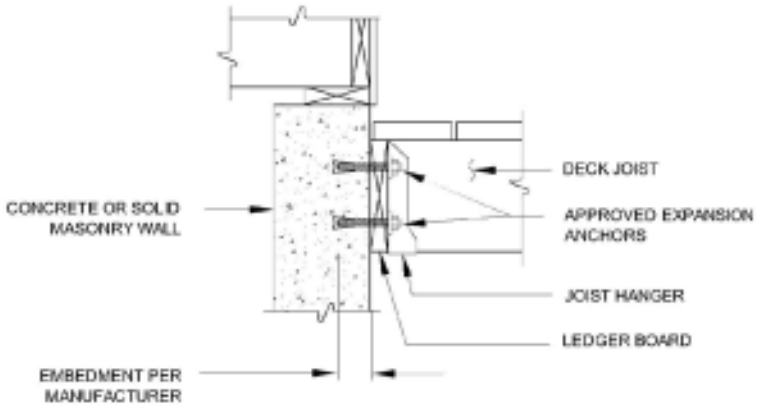
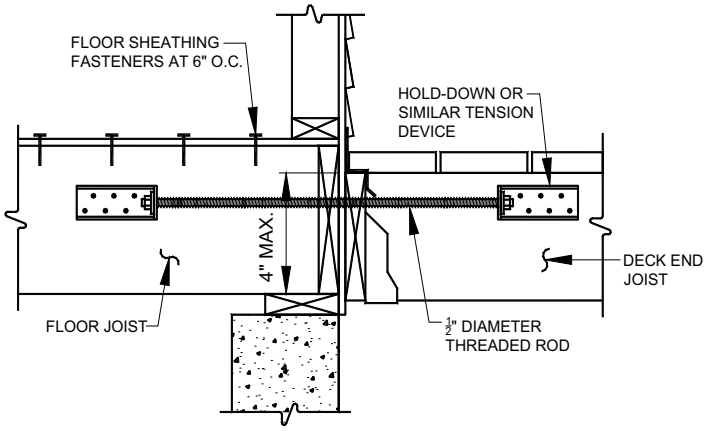


FIGURE R507.8.3
LEDGER BOARD TO HOLLOW MASONR FOUNDATION WALL ATTACHMENT

R507.9.3 Attachment to resist lateral load. A lateral load connection is required by Section R507.2. The following options shall be deemed to comply; other design solutions are permitted in accordance with R301.

R507.9.3.1 Connection at parallel joists. Where floor joists and deck joists are parallel, a hold-down or similar tension device with a minimum capacity of 1,500 pounds (6672 N) at each end joist as shown in Figures R507.3.1(1) and R507.9.3.1(2) shall be permitted. Floor sheathing to floor joists fasteners shall be permitted to be substituted with two reinforcing angles on each side of the joist with a minimum capacity of 375 pounds (1668 N).



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

FIGURE R507.9.3.1(1)
CONNECTION AT PARALLEL JOISTS

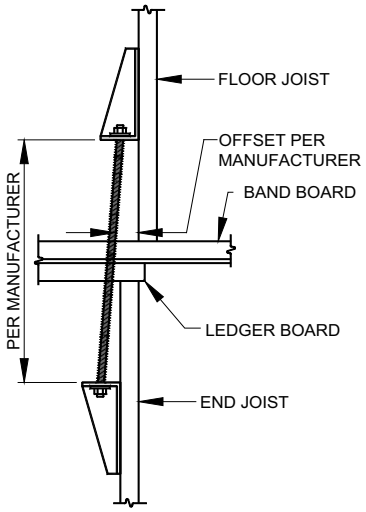
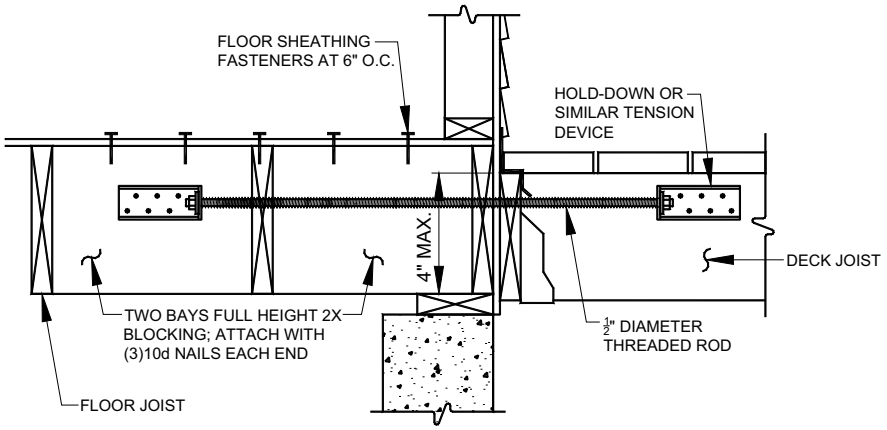


FIGURE R507.9.3.1(2)
OFFSET AT PARALLEL JOISTS

R507.9.3.2 Connection at perpendicular joists. Where floor joists and deck joists are perpendicular, provide a hold-down or similar tension device with a minimum capacity of 1,500 pounds (6672 N) at each end joist and blocking between floor joists as shown in Figure R507.9.3.2. Floor sheathing to floor joists fasteners shall be permitted to be substituted with two reinforcing angles on each side of the joist with a minimum capacity of 375 pounds (1668 N).



For SI: 1 inch = 25.4 mm

FIGURE R507.9.3.2
LATERAL SUPPORT WHERE INTERIOR JOIST PERPENDICULAR TO DECK

R507.10 Free-standing decks. As shown in Figure R507.10, free-standing decks shall have an additional beam and posts adjacent the building exterior wall in place of a ledger board attachment. The beam shall be sized in accordance with Section R507.6 and shall be located adjacent the exterior wall or at a maximum distance equal to the allowable joist cantilever.

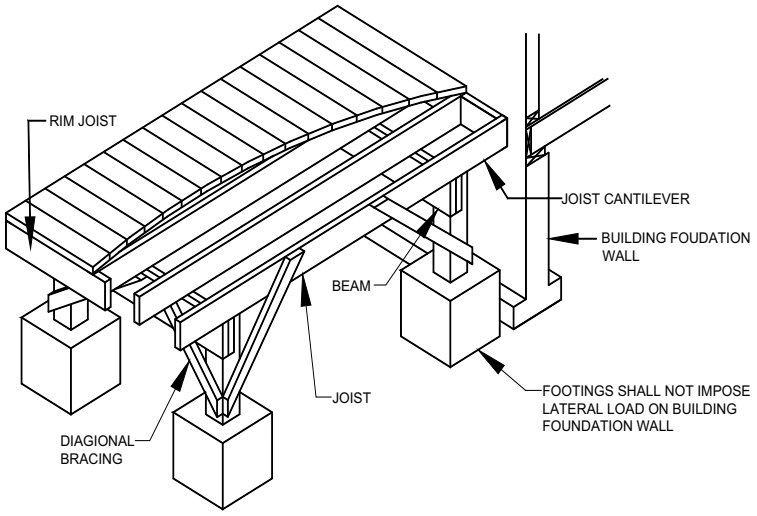
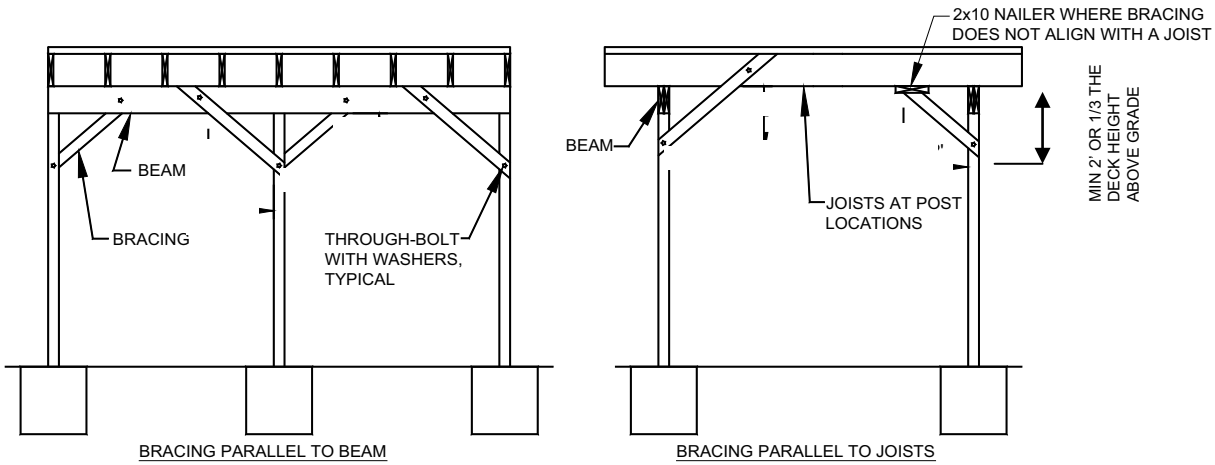


FIGURE R507.10
FREE-STANDING DECK

R507.10.1 Diagonal bracing. Diagonal bracing shall be installed on free-standing decks greater than 30 inches (762 mm) above grade in accordance with Figure R507.10.1. Bracing shall be placed at a 45 degree angle at each post location in the parallel and perpendicular directions to the beam. Bracing shall be a minimum of nominal 2x4 lumber and shall be fastened to framing with one 1/2 inch (9 mm) diameter through bolt with washers at each end. The diagonal brace shall be a minimum of 2 feet long measured as shown in Figure R507.10.1 or at least 1/3 the height of the deck above grade.

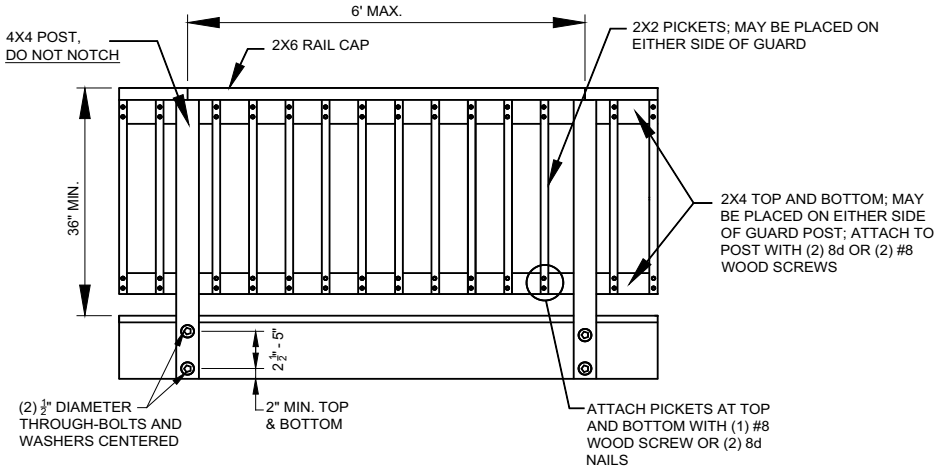


For SI: 1 foot = 304.8 mm

FIGURE R507.10.1
FREE-STANDING DECK DIAGONAL BRACING

R507.12 Deck guards. Deck guards shall be designed and constructed in accordance with Sections R301.5 and R312. Other materials and construction techniques shall be permitted in accordance with Section R301.

R507.12.1 Guard construction. Where the guard requirements of Sections R301.5 and R312 are met using the details shown in Figures R507.12.1(1) through R507.12.1(3), guard posts shall be attached to the inside or outside face of the rim joist or end joist. Hold-down anchors shall have a minimum capacity of 1,800 pounds (8006 N).



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

FIGURE R507.12.1(1)
DECK GUARD

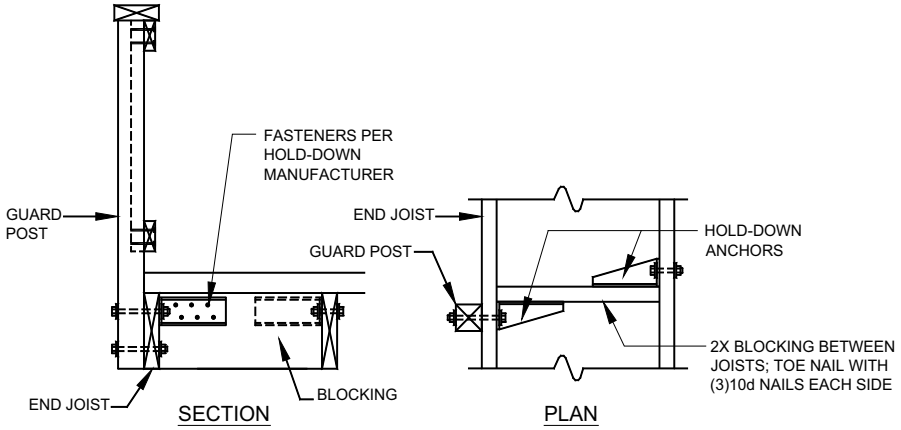


FIGURE R507.12.1(2)
GUARD POST TO END JOIST

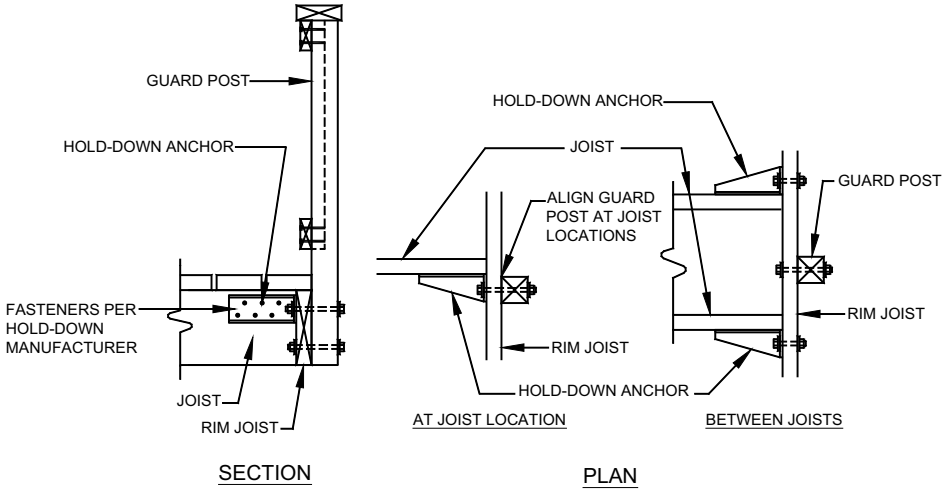
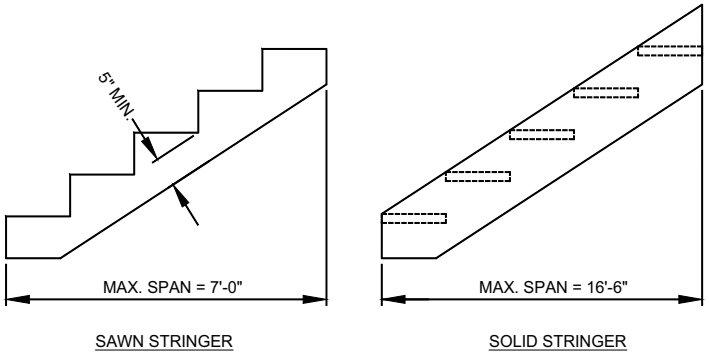


FIGURE R507.12.1(3)
GUARD POST TO RIM JOIST

R507.13 Deck stairs. Deck stairs shall be constructed in accordance with this section and Section R311.7. Where a flight of stairs has a vertical rise greater than that allowed per Section R311.7.3, an intermediate landing shall be provided in accordance with Section R311.7.6 and designed as a free-standing deck in accordance with Section R507.10.

R507.13.1 Stair stringers. Stair stringers shall be constructed of sawn nominal 2x12 members at 18 inches (457 mm) on center with a throat dimension of 5 inches (127 mm) and a maximum span length as shown in Figure R507.13.1. Stairs with a width equal to 36 inches (914 mm) shall be permitted to be constructed with two solid 2x12 stringers with a maximum span length as shown in Figure R507.13.1.



For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

FIGURE R507.13.1
STAIR STRINGER REQUIREMENTS

R507.13.2 Stringer bearing. Stringers shall be attached to posts or bear on joist hangers attached to the deck structure and on footings at grade in accordance with Figure R507.13.2. Joist hangers shall be specifically designed to accommodate sloped connections and shall have a minimum capacity of 625 pounds (2780 N). Reinforcing angles at rim joist locations only shall have a minimum capacity of 325 pounds (1446 N).

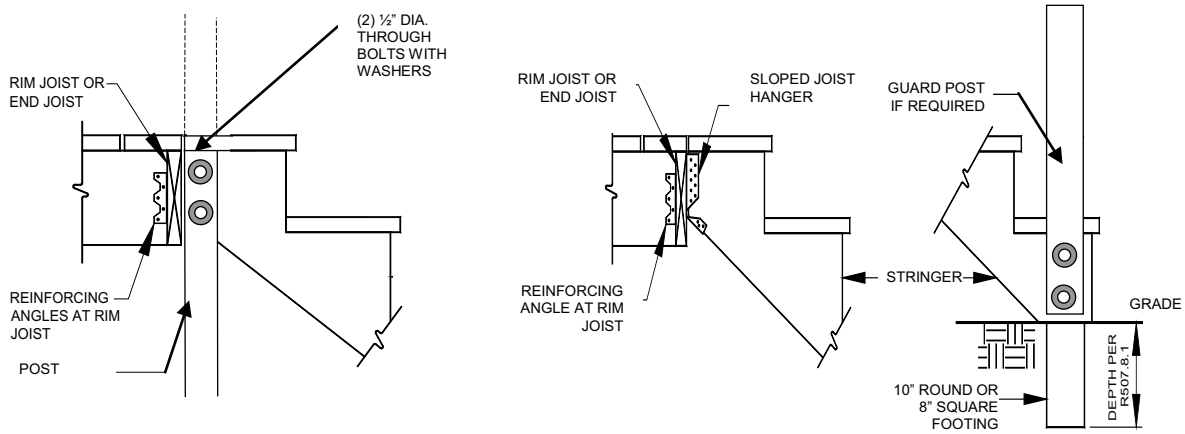


FIGURE R507.13.2
STRINGER BEARING

R507.13.3 Treads and risers. Stair treads shall be constructed in accordance with Section R311.7 and Figure R507.13.3. Treads shall be composed of nominal 2x6 lumber. Treads of stairs constructed with

solid stringers shall be permitted to be composed of span rated decking. Risers shall be permitted to be composed of nominal 1x lumber. Openings in risers shall not allow the passage of a 4 inch (102 mm) diameter sphere.

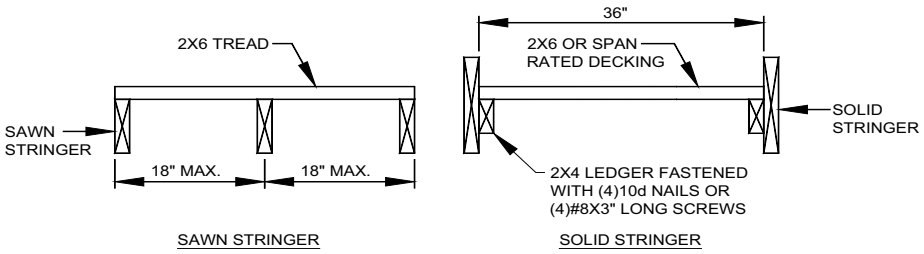
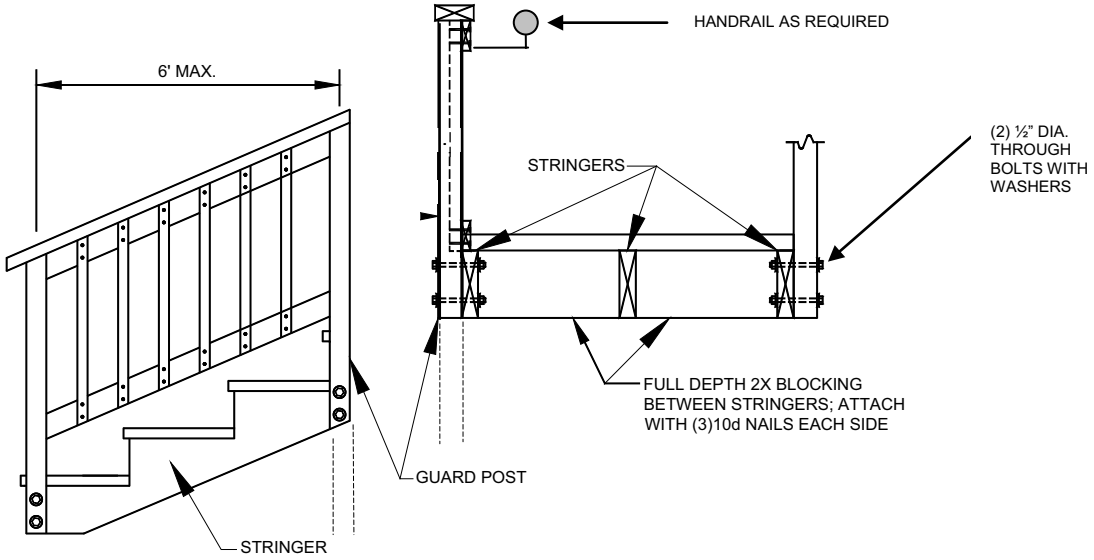


FIGURE R507.13.3
TREAD REQUIREMENTS

R507.13.4 Stair guard. Guards for stairs shall be as required per Section R312.1.1 and constructed in accordance with Section R507.12. The attachment of a stair guard post to the stringers shall be constructed in accordance with Figure R507.13.4.



For SI: 1 foot = 304.8 mm

FIGURE R507.13.4
STAIR GUARD CONNECTION

R507.13.5 Stair handrails. When required, handrails for stairs shall be as required per Section R311.7.8. When required and where the top guard rail does not comply with the handrail grip-size requirements in Section R311.7.8.3, a separate, conforming handrail shall be required.

R507.13.6 Ramps. Ramps from decks shall be as required in Section R311.8. Details for stringers, guards and handrails shall be similar to those for stairs.

Reason: With the increasing attention being paid to deck safety, the 2012 IRC took a major step forward by establishing a new Section R507 that covers deck construction. However, Section R507 consists almost entirely of connection details for anchoring the deck to the house, and does not provide any prescriptive requirements for building the deck itself. Some information is completely missing, like joist spans for naturally durable wood species, joist spans for wet lumber, beam spans, post sizes, bracing, footings and stair stringer spans.