

Code Technology Committee

Area of Study – Climbable Guards

2007/2008 Cycle

Code changes related to the CTC area of study noted above

The following are code changes related to the CTC Climbable Guards Area of Study that will be considered at the 2007/2008 Code Development Hearings in Palm Springs, California.

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S72-07/08

1607.7.1.2; IRC R312.2

Proponent: Bruce Dodge, Building Official, City of Grand Haven, MI, representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1607.7.1.2 Components. Intermediate rails (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds (0.22 kN) on an area equal to 1 square foot (0.093m²), including openings and space between rails. Reactions due to this loading are not required to be superimposed with those of Section 1607.7.1 or 1607.7.1.1. Where balusters or cables or individual components must comply with opening limitations in accordance with Section 1013.3, the individual components shall not allow the passage of a 4 inch (102 mm) sphere except when a force greater than 50 pounds (0.22 kN) is applied to the sphere in any direction.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R312.2 Guard opening limitations. Required guards on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails, balusters, cables or ornamental closures which do not allow passage of a sphere 4 inches (102 mm) or more in diameter except when a force greater than 50 pounds (0.22 kN) is applied to the sphere in any direction.

Exceptions:

1. The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway are permitted to be of such a size that a sphere 6 inches (152 mm) cannot pass through.
2. Openings for required guards on the sides of stair treads shall not allow a sphere 4 3/8 inches (107 mm) to pass through

Reason: With guard rails being made of plastic or cables which can be very strong in one direction and weak in the other I have found some guard rails that can be spread with little effort allowing a four inch sphere to go through with little or no effort. Section 1607.7.1.2 only require

the 12 inch square horizontal test showing that the components will withstand the side pressure of 50 pounds. I spoke to ICC about this issue and found that when ESS approves a guardrail system the guardrails are tested to an ASTM Standard but it does not include a requirement to test for separation of the components.

What good is a guardrail if children can squeeze through? Therefore, I'm proposing a change to require that the balusters / components of the guardrail be tested to show that it will take a minimum of 50 pound pressure to spread them apart to allow a 4 inch sphere to pass through. An inspector, manufacturer, or contractor can do a test very easily by getting a 4-inch sphere and a fish scale and pulling the 4 inch sphere through the railing when an inspector thinks that it will not meet the 50 pound test.

I have inspected guardrails where a 4-inch sphere will come through the balusters with less than 10 pounds of pressure. Next time you see a plastic guardrail try putting your knee through the balusters and see how much pressure it takes. Some I have tried are very strong but others will allow it with very little pressure.

Cost Impact: The code change proposal may increase the cost of construction.

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E83-07/08

1013.1, 1002.1, (IFC [B] 1013.1, [B] 1002.1)

Proponent: Thomas Kinsman, T.A. Kinsman Consulting Company, representing himself

1. Revise as follows:

1013.1 (IFC [B] 1013.1) (Supp) Where required. Guards shall be located along open-sided walking surfaces, mezzanines, equipment platforms, seatboards, stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below. Guards shall be adequate in strength and attachment in accordance with Section 1607.7. Where glass is used to provide a guard or as a portion of the guard system, the guard shall also comply with Section 2407. Guards shall also be located along glazed sides of stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below where the glazing provided does not meet the strength and attachment requirements in Section 1607.7.

Exception: Guards are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas, such as runways, ramps and side stages used 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.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where guards in accordance with Section 1025.14 are permitted and provided.

2. Add new definition as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SEATBOARD. Any furniture intended for sitting that is fixed in place or other building features greater than 4 inches in width that could be used for sitting such as parapet wall tops at roof decks.

Reason: This proposal should be considered with a companion code change that seeks to strike the term "seatboard" from Section 1013.2. If the companion code change is rejected, this proposal is set forth to better clarify the code with respect to seatboards. The underlying concern is the liability for design professionals due to the lack of understanding of what a seatboard is.

This proposal accomplishes two goals: (1) it locates the term "seatboard" in the charging language in Section 1013.1 that otherwise sets forth a long list of locations of where guards are required; and (2) it sets forth a definition of the term seatboards.

The reference to seatboards in Section 1013.1 is needed because it is currently missing from the list of locations where guards are currently required and it is unique from all current locations. One shouldn't have to go to a section titled "Height" to determine if guards are required on seatboards.....rather it should be found in a section titled "Where required".

Based on informal comment from ICC staff, the term seatboard came from the legacy codes and was related to bleachers and grandstands. There was discussion in the last cycle when E98-06/07 was debated that indicated "seatboards" meant fixed furniture. The reference to ICC 300 standard in E98-06/07 for guards for bleachers was rejected. If the code committee desires to keep the term seatboard, a definition is necessary. Seats are defined as a chair, bench, or pew and designed to support persons in the sitting position. Boards are defined as a piece of wood sawn thin and with considerable length in comparison with its thickness.

If the intent in the code is to address the possibility of someone standing on a surface that could be used for sitting, this is a very necessary code change.

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

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E84-07/08

1013.1 (IFC [B] 1013.1)

Proponent: Thomas B. Zuzik Jr., Artistic Railings Inc., representing himself

Revise as follows:

1013.1 (IFC [B] 1013.1) (Supp) Where required. Guards shall be located along open-sided walking surfaces, mezzanines, equipment platforms, stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontal to the edge of the open side. Guards shall be adequate in strength and attachment in accordance with Section 1607.7. Where glass is used to provide a guard or as a portion of the guard system, the guard shall also comply with Section 2407. Guards shall also be located along glazed sides of stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below where the glazing provided does not meet the strength and attachment requirements in Section 1607.7.

Exception: Guards are not required for the following locations:

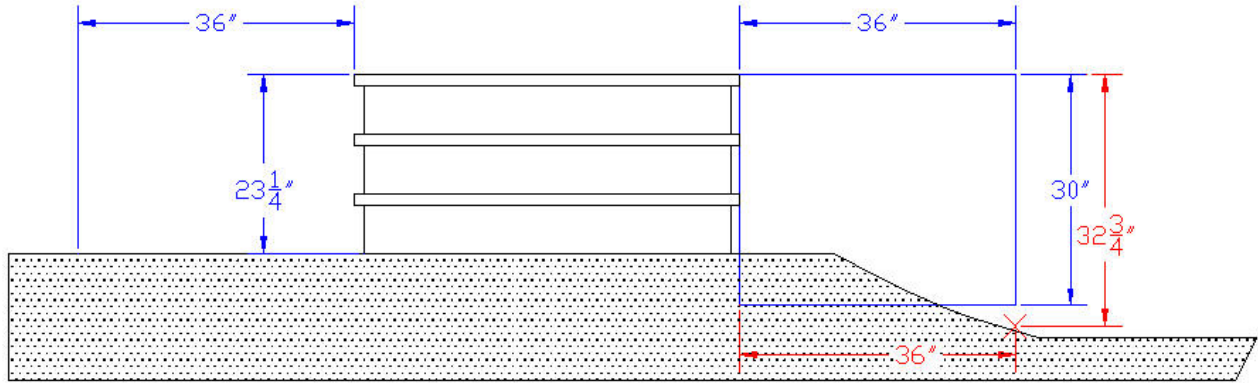
1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas, such as runways, ramps and side stages used for entertainment or presentations.
4. At vertical 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.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where guards in accordance with Section 1025.14 are permitted and provided.

Reason: To provide fixed points for measuring the 30 inch vertical riser height of elevated surfaces to determine if guards are required.

1. The existing R312.1 states that guards are required when the walking surface is 30 inches or more above the walking surface below, however it does not define clearly where to measure that vertical measurement. This proposed code change also sets a set of parameters as to where to take the measurements.

2. I the author, previously submitted this proposal in the prior code cycle and used the 24 inch offset measurement that is published in the BOCA 1996 building code, section 1825.0 retaining walls, section 1825.5 guards, as the determining distance or point of reference for when retaining walls where required to have guards. Upon request from multiple supporters of the previous proposal a change from 24 inches to 36 inches was made to allow for an area the size of a minimum landing as required in the IRC for inside and outside exterior doors.

The diagram below was drawn by the author and is shown as a visual guide or technical drawing. The drawing shows a 3 riser front entry stoop with 7-3/4" risers from a front elevation. The ground is detailed in outlined dots. The 36" horizontal with 30" vertical box on the right shows the area in which the code change submits the measurements should be taken. The 32-3/4" vertical point shows the deepest point within the 36" horizontal edge measurement. The left side of the stoop is shown not over 30" in height and thus no guard required.



Thus if this stoop was on a facility it would require a guard be installed on the right side only as the left side is not 30 inches or more deep.

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

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E85—07/08

1013.1, 1013.1.1 (New), 1013.2, 1013.3, 1013.5, 1013.6 (IFC [B] 1013.1, [B] 1013.1.1 (New), [B] 1013.2, [B] 1013.3, [B] 1013.5, [B] 1013.6); IRC R312.1, R312.2

Proponent: Paul K. Heilstedt, P.E., Chair, representing ICC Code Technology Committee (CTC)

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

1. Revise as follows:

SECTION 1013.0 GUARDS

1013.1 (IFC [B] 1013.1) (Supp) Where required. Guards shall be located along open-sided walking surfaces, including mezzanines, equipment platforms, stairways, stairs, ramps and landings, that are located more than 30 inches measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side above the floor or grade below. Guards shall be adequate in strength and attachment in accordance with Section 1607.7. ~~Where glass is used to provide a guard or as a portion of the guard system, the guard shall also comply with Section 2407. Guards shall also be located along glazed sides of stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below where the glazing provided does not meet the strength and attachment requirements in Section 1607.7.~~

Exception: Guards are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas such as runways, ramps and side stages used 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.

6. Along vehicle service pits not accessible to the public.
7. In assembly seating where guards in accordance with Section 1025.14 are permitted and provided.

2. Add new text as follows:

1013.1.1 (IFC [B] 1013.1.1) Glazing. Where glass is used to provide a guard or as a portion of the guard system, the guard shall also comply with Section 2407. Where the glazing provided does not meet the strength and attachment requirements in Section 1607.7, complying guards shall also be located along glazed sides of open-sided walking surfaces.

3. Revise as follows:

1013.2 (IFC [B] 1013.2) (Supp) Height. ~~Required guards shall form a protective barrier~~ be not less than 42 inches (1067 mm) high, measured vertically above the adjacent walking surfaces, adjacent fixed seating or the line connecting the leading edge edges of the tread-treads , adjacent walking surface or adjacent seatboard.

Exceptions:

1. ~~For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards whose top rail also serves as a handrail shall have a height not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from the leading edge of the stair tread nosing. 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. ~~For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.~~
2. ~~3.~~ The height in assembly seating areas shall be in accordance with Section 1024.14.
3. ~~4.~~ Along alternating tread device, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

1013.3 (IFC [B] 1013.3) (Supp) Opening limitations. ~~Open Required guards shall have balusters or ornamental patterns such that a~~ Required guards shall have balusters or ornamental patterns such that a not have openings which allow passage of a sphere 4-inch-inches (102 mm) diameter sphere in diameter from the walking surface to the required guard height cannot pass through any opening up to a height of 34 inches (864 mm). From a height of 34 inches (864 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.

Exceptions:

1. From a height of 36 inches (914 mm) to 42 inches (1067 mm), guards shall not have openings which allow passage of a sphere 4.375 inches (111 mm) in diameter.
4. ~~2.~~ The triangular openings at the open sides of a stair, 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 of 6 inches (152 mm) in diameter cannot pass through the opening. not allow passage of a sphere 6 inches (152 mm) in diameter.
2. ~~3.~~ 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. not have openings which allow passage of a sphere 21 inches (533 mm) in diameter.
3. ~~4.~~ In areas which are not open to the public within occupancies in Group I-3, F, H or S, and for alternating tread devices 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. guards shall not have openings which allow passage of a sphere 21 inches (533 mm) in diameter.
4. ~~5.~~ In assembly seating areas, guards at the end of aisles where they terminate at a fascia of boxes, balconies and galleries shall have balusters or ornamental patterns such that a not have openings which allow passage of a sphere 4 inch inches (102mm) in diameter sphere cannot pass through any opening up to a height of 26 inches (660 mm). From a height of 26 inches (660 mm) to 42 inches

(1067 mm) above the adjacent walking surfaces, guards shall not have openings which allow passage of a sphere 8 inches (203 mm) in diameter shall not pass.

~~5- 6.~~ Within individual dwelling units and sleeping units in Group R-2 and R-3 occupancies, openings for required guards on the sides of stair treads shall not allow a sphere of 4.375 inches (111 mm) to pass through. guards on the open sides of stairs shall not have openings which allow passage of a sphere 4.375 (111 mm) inches in diameter.

1013.4. (IFC [B] 1013.4) Screen porches. (No change to current text)

1013.5 (IFC [B] 1013.5) Mechanical equipment. Guards shall be provided where appliances, equipment, fans, roof hatch openings or other components that require service are located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent the passage of a sphere 21 inch inches (533 mm) in diameter sphere. The guard shall extend not less than 30 inches (762 mm) beyond each end of such appliance, equipment, fan or component.

1013.6 (IFC [B] 1013.6) Roof access. Guards shall be provided where the roof hatch opening is located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent the passage of a sphere 21 inch inches (533 mm) in diameter sphere.

PART II – IRC BUILDING AND ENERGY

1. Revise as follows:

SECTION R312 GUARDS

R312.1 (Supp) Where Guards required. ~~Guards shall be provided on all decks, landings, porches, balconies, ramps or raised floor surfaces located more than 30 inches (762 mm) above the floor or grade below. Required guards shall not be less than 36 inches 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. Guards shall be located along open-sided walking surfaces, including stairs, ramps and landings, that are located more than 30 inches 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.~~

~~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.~~

2. Add new text as follows:

R312.2 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 not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

3. Revise as follows:

R312.2 R312.3 Guard Opening limitations. ~~Required guards on open sides of stairways, raised floor areas,~~

balconies and porches shall ~~not have openings intermediate rails or ornamental closures~~ which do not allow passage of a sphere 4 inches (102 mm) ~~or more~~ in diameter from the walking surface to the required guard height.

Exceptions:

1. The triangular openings at the open side of a stair, formed by the riser, tread and bottom rail of a guard, at the open side of a stairway shall be permitted to be of such a size that a sphere 6 inches cannot pass through. ~~not allow passage of a sphere 6 inches (153 mm) in diameter.~~
2. ~~Openings for required guards on the open sides of stair treads stairs shall not allow passage of a sphere 4 3/8 inches or more in diameter to pass through~~ Guards on the open sides of stairs shall not have openings which allow passage of a sphere 4.375 inches (111 mm) in diameter

Reason: 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/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held twelve meetings - all open to the public.

This proposed change is a result of the CTC’s investigation of the area of study entitled “Climbable Guards”. The scope of the activity is noted as:

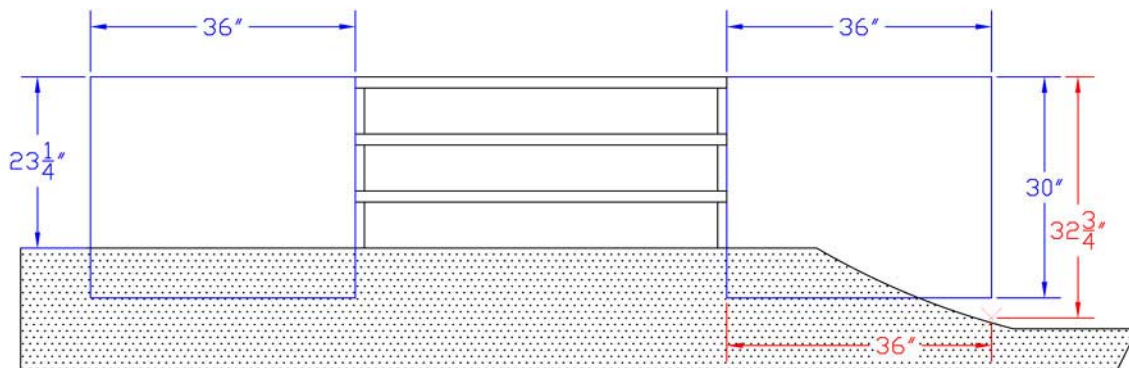
The study of climbable guards will focus on determining the need for appropriate measures to prevent or inhibit an individual from utilizing the elements of a guard system, including rails, balusters and ornamental patterns, to climb the guard, thereby subjecting that person to the falling hazard which the guard system is intended to prevent.

This proposal is a follow-up to E96 – 06/07. As of this writing this area of study has been completed by the CTC relative to these proposals. The general focus of these two proposals, one to the IBC and one to the IRC, is to create consistency in language regulating guards in the two codes.

Part I – IBC

IBC 1013.1. Laundry lists of items in the code are typically not all-inclusive. The word “including” provides this clarification in the following sections as well. This section is divided into two paragraphs with the second paragraph dealing with glass and glazing without a change in intent.

The key part of this change to IBC 1013.1 is submitted in order to clarify how the height measurement which triggers the guard requirement is made relative to proximity to the adjacent fall-off. This is illustrated in the following figure:



The view is taken from the landing of a 3 riser stair, looking towards the face of the risers.



IBC 1013.2: The technical portions of this change are the changes that stipulates that the provisions are applicable to only required guards and that a fixed seat becomes a potential walking surface to a child and thus warrants the guard height to be measured from that point. The remainder does not change the intent but rather provides standardized text dealing with stair treads and the determination of how to measure guard height. This public comment revises the term to “fixed seating” so as to clarify the measurement, using common terminology. Fixed seating represents a walking surface that is sure to be utilized by children. As such, the measurement of the guard must be taken from this location to address the hazard of a child falling over the guard. It is impossible for the code to regulate ornamentals such as planters, furniture and the like and this proposal does not intend to regulate them.

IBC 1013.3: This section is also clarified to apply to only required guards. In the disapproval of E96-06/07, committee notes that they feel that exceptions 1 and 2 are redundant. A careful reading of the text revisions reveals a subtle difference. Exception 1 is a general exception for guard height along stairs. Exception 2 addresses the guard height where the top of the guard serves as a handrail. This distinction is intended to provide clarification in the code for the two possible scenarios.

The majority of the revision in this section and exception involve editorial rewording of the sentences for clarity and consistency. The technical change is to exception 1 to reduce the maximum opening (8” to 4-3/8” inches) for this upper portion of the guard above 36 inches.

The 8 inch limitation on openings at the upper section of the guard was based on the difference between the 34 inch height being the part of the guard that protects small children and the 42 inch height for the rest of the population. However this does not take into account that residential R-3 use groups require a minimum guard height of 36 inches. Proposed exception 1 raises the height for which the 4 inch opening requirement is applicable - to coincide with the minimum guard height of 36 inches in residential occupancies.

The change in maximum opening size at the upper portion of the guard, from the current 8 inch sphere criteria to a 4-3/8 inch sphere, is based on providing an equivalent level of protection as that provided by the current 4 inch opening on the lower portion of the guard. As a point of reference, the following measurements of head sizes of infants are excerpted from Drawing #2 Measurement of Infants from a book entitled “The Measure of Man and Woman: Human Factors” by Alvin R. Tilley, first published by Whitney Library of Design in 1993, republished and copyrighted by John Wiley & Sons, New York (ISBN 0-471-09955-4) in 2002.

The publication states “We have chosen to accommodate 98% of the U.S. population, which lies between the 99 percentile and the 1 percentile, for product designs for civilians” page 10-11 headlined percentiles.

<u>Age</u>	<u>Side-to-side measurement</u>	<u>Back-to-front measurement</u>
12-15 months:	5”	6.5”
16-19 months:	5”	6.5”
20-23 months:	5.1”	6.8”

Additional point of reference, from the same book entitled “The Measure of Man and Woman: Human Factors” by Alvin R. Tilley, figure number 8, page 14, showing child age 2.5 – 3 years. The chest dimension when scaled (1” = 12”) shows a 4-3/4” dimension from the back to the front.

The following information from various resources has been compiled to illustrate how countries outside of the US are regulating the openings in guards:

Country of Origin	Sphere Rule Metric	Sphere Rule Inches
Canada	100mm	3.94”
United Kingdom	100mm	3.94”
United States	102mm	4”
Australia	125mm	4.92”
Germany	120mm	4.72”
France	110mm	4.33”
Mexico (no code – standard followed)	102mm – 152mm	4” – 6”
Russia	100mm	3.94”
Romania	100mm	3.94”
Trinidad & Tobago	102mm	4”

Japan (Confirmation Pending)	125mm	4.92"
Spain (Confirmation Pending)	(120mm) (125mm)	(4.72") (4.92")
Switzerland	120mm	4.72"
Sweden	100mm	3.94"
Taiwan (Confirmation Pending)	125mm	4.92"
Singapore (Confirmation Pending)	125mm	4.92"
Poland (Confirmation Pending)	100mm	3.94"
Turkey	100 mm	3.94"
Netherlands (Confirmation Pending)	100mm	3.94"

Part II – IRC

IRC R312.1: This section is being divided into two sections, similar to the IBC. The first section includes the general guard requirement, and the new section (R312.2) includes the height requirements. See reason for IBC Section 1013.1.

IRC R312.2: This new section includes the guard height requirements. It is reformatted to place emphasis on the 36" high guard required at level surfaces. There are not technical changes to the minimum height. As noted in the current text to IRC Section R312.2, the IRC applies to required guards. The term "required" is proposed here as well. This section uses the term "adjacent fixed seating" – intended to clarify that where there is built-in seating, the guard height is to be measured from the seat itself to provide for the minimum required height where it is assumed that children may be standing. See reason for IBC Section 1013.2.

IRC R312.3: The majority of the revision in this section and exception involve editorial rewording of the sentences for clarity and consistency.

Bibliography:

Interim Report No. 1 of the CTC, Area of Study – Climbable Guards, March 9, 2006.
 "The Measure of Man and Woman: Human Factors" by Alvin R. Tilley

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

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E86–07/08

1013.2 (IFC [B] 1013.2)

Proponent: Thomas B. Zuzik Jr, Artistic Railings, Inc., representing himself

Revise as follows:

1013.2 (IFC [B] 1013.2) (Supp) Height. Guards shall ~~form a protective barrier~~ not be less than 42 inches (1067 mm) high, measured vertically above the leading edge of the tread, adjacent walking surface or adjacent ~~seatboard~~ fixed seating.

Exceptions:

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards whose top rail also serves as a handrail shall have a height not less than 34 inches (864 mm) and not more than 38 inches (1067 mm) measured vertically from the leading edge of the stair tread nosing.
2. The height in assembly seating areas shall be in accordance with Section 1024.14.
3. Along alternating tread device, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

Reason: .The wording to "form a protective barrier" describes a function and not the height and if used is more suited for section 1013.1 as 1013.2 is establishing the height of the guard only and were to measure it height from. The wording for 1013.2 should be limited to just the guard's height as the sub-title states.

2. As noted in previous code cycles, proposals requesting the removal of the wording seatboard on the basis that a seatboard is not defined in the ICC family of codes and standards. With the constant debate over the wording a more appropriate term "fixed seating" is offered to clarify the intended location. Fixed meaning not movable and seating a product designed specifically for sitting on.

This proposal is intended to simplify the wording published in 1013.2 height for the guard section of the building code.

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

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E87-07/08

1013.2, (IFC [B] 1013.2)

Proponent: Thomas Kinsman, T. A. Kinsman Consulting Company, representing himself

Revise as follows:

1013.2 (IFC [B] 1013.2) (Supp) Height. Guards shall form a protective barrier not less than 42 inches (1067 mm) high, measured vertically above the leading edge of the tread, or adjacent walking surface ~~or adjacent seatboard.~~

Exceptions:

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards whose top rail also serves as a handrail shall have a height not less than 34 inches (864 mm) and not more than 38 inches (1067 mm) measured vertically from the leading edge of the stair tread nosing.
2. The height in assembly seating areas shall be in accordance with Section 1024.14.
3. Along alternating tread device, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

Reason: The proposal deletes the terms "adjacent seatboard" because it is an undefined term and therefore causes an unwarranted high liability exposure for design professionals and others in the construction industry. Is a seatboard always bench like? Can it be made out of materials other than wood? Is a wide parapet wall top a seat board if it is wide enough to sit on?

If this proposal fails, there is a companion code change that proposes a definition for seatboard and include reference to it in the list of locations in 1013.1 of where guards are required

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

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RB58-07/08

R312.1, R312.2 (New), R312.3

Proponent: Thomas B. Zuzik, Jr., Artistic Railings, Inc., representing himself

Revise as follows:

R312.1 (Supp) Where Guards required. ~~Guards shall be provided on all decks, landings, porches, balconies, ramps or raised floor surfaces located more than 30 inches (762 mm) above the floor or grade below. Required guards shall not be 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.~~ Guards shall be located along open-sided walking surfaces, including porches, decks, balconies, mezzanines, stairs, ramps and landings, which are located more than 30 inches (762mm) 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.

~~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.~~

R312.2 Height. Required guards at open-sided walking surfaces, including stairs, porches, balconies or landings, shall not be less than 36 inches (914mm) high measured vertically above the above the adjacent walking surface or the line connecting the leading edges of the treads.

Exception: 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 edge of the treads, and where the guard also serves as the required handrail the height shall not exceed 38 inches (965 mm) measured vertically from a line connecting

the leading edge of the treads.

R312.2 R312.3 Guard Opening limitations. Required guards on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails or ornamental closures which do not allow passage of a sphere 4 inches (102 mm) or more in diameter.

Exceptions:

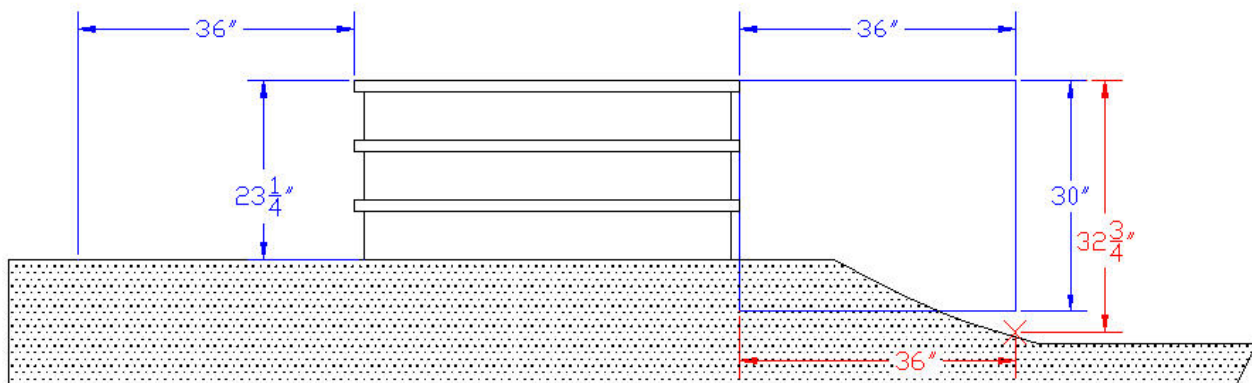
1. The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway are permitted to be of such a size that a sphere 6 inches (152 mm) cannot pass through.
2. Openings for required guards on the sides of stair treads shall not allow a sphere 4 3/8 inches (107 mm) to pass through.

R312.3 R313.4 (Supp) Exterior wood plastic composite guards. Wood plastic composite guards shall comply with the provisions of Section R319.4

Reason: The purpose of the proposal is to create consistency between IRC 312 & IBC 1013 and next to provide fixed points for measuring the 30 inch vertical riser height of elevated surfaces to determine when guards are required.

1. R312.1 is being broken down in to 2 sections and then moves the existing 312.2 to 312.3. The new R312.1 is centered on general guard requirements of establishing when a guard is required. The new 312.2 establishes the height requirements of the guard along with its stair height exception. The new 312.3 removes the word guard as this is the title of the section and deals directly with the topic of opening limitations.
2. The existing R312.1 states that guards are required when the walking surface is 30 inches or more above the walking surface below, however it does not define clearly were to measure that vertical measurement. This proposed code change also sets a set of parameters as to where to take the measurements.
3. I the author, previously submitted this proposal in the prior code cycle and used the 24 inch offset measurement that is published in the BOCA 1996 building code, section 1825.0 retaining walls, section 1825.5 guards, as the determining distance or point of reference for when retaining walls where required to have guards. Upon request from multiple supporters of the previous proposal a change from 24 inches to 36 inches was made to allow for an area the size of a minimum landing as required in the IRC for inside and outside exterior doors.

The diagram below was drawn by the author and is shown as a visual guide or technical drawing. The drawing shows a 3 riser front entry stoop with 7-3/4" risers from a front elevation. The ground is detailed in outlined dots. The 36" horizontal with 30" vertical box on the right shows the area in which the code change submits the measurements should be taken. The 32-3/4" vertical point shows the deepest point within the 36" horizontal edge measurement. The left side of the stoop is shown not over 30" in height and thus no guard required.



Thus if this stoop was on a home it would require a guard be installed on the right side only as the left side is not 30 inches or more deep.

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

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

RB59-07/08

R312.1

Proponent: Thomas B. Zuzik, Jr., Artistic Railings, Inc., representing himself

Revise as follows:

R312.1 (Supp) Where Guards required. Guards shall be provided on all decks, landings, porches, balconies, ramps or raised floor surfaces located more than 30 inches (762 mm) above the floor or grade below. Required guards shall not be less than 36 inches (914 mm) in height, measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. ~~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.~~

Exception: 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 edge of the treads, and where the guard also serves as the required handrail the height shall not exceed 38 inches (965 mm) measured vertically from a line connecting the leading edge 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.

Reason: To simplify when guards are required on all walking surfaces and then list basic exemptions.

1. R312.1 is simplified to when the walking surface is over 30 inches from the level below a guard 36 inches in height is required.
2. Next the exception for the height of a guard on stairs is moved to a proper location as the lower height and upper height are an exception to the standard requirement. This breaks up the run on of additional wording in the main paragraph.
3. The IBC does not require the restriction of when the total height of the risers exceeds 30 from the lower landing that guards are required, thus the IRC should follow in example.
4. The wording for requiring guards on the stairs does not take in to account that you can have a total rise over 30 inches but never have an area of the stairs or upper landing over 30 inches above the immediate area adjacent to the upper landing or stairs.

Example: A 7 riser set of steps coming up a lawn rising above the lower walkway 49 inches, but the lawn ascends up along the steps no more than 8" below each step. The open sides of the stairs has a total rise greater than 30 inches from the starting grade below, but never a 30 inch fall rise within 36 inches horizontal of any edge of the stairs.

In conclusion the requirement as currently written is not in agreement with the standards set in the IBC.

5. The existing R312.1 states that guards are required when the walking surface is 30 inches or more above the walking surface below, however it does not define clearly were to measure that vertical measurement. This proposed code change also sets a set of parameters as to where to take the measurements.
6. I the author, previously submitted a similar proposal in the prior code cycle and used the 24 inch offset measurement that is published in the BOCA 1996 building code, section 1825.0 retaining walls, section 1825.5 guards, as the determining distance or point of reference for when retaining walls where required to have guards. Upon request from multiple supporters of the previous proposal a change from 24 inches to 36 inches was made to allow for an area the size of a minimum landing as required in the IRC for inside and outside exterior doors.

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

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RB60-07/08

R312.1

Proponent: Thomas B. Zuzik, Jr., Artistic Railings, Inc., representing himself

Revise as follows:

R312.1 (Supp) Where Guards required. Guards shall be provided on all decks, landings, porches, balconies, ramps or raised floor surfaces located more than 30 inches (762 mm) above the floor or grade below. Required

guards shall not be 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.~~

Exception: 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 edge of the treads, and where the guard also serves as the required handrail the height shall not exceed 38 inches (965 mm) measured vertically from a line connecting the leading edge 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.

Reason: To simplify when guards are required on all walking surfaces and then list basic exemptions.

1. R312.1 is simplified to when the walking surface is over 30 inches from the level below a guard 36 inches in height is required.
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In conclusion the requirement as currently written is not in agreement with the standards set in the IBC.

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