

**Code Technology Committee  
2006/2007 Cycle  
Area of study – Climbable Guards  
Public comments**

The following are code changes for which the CTC has established a position and testified at the 2006 Code Development Hearings. These code changes have received a public comment and will be considered at the 2007 Final Action Hearings. These are assembled for the CTC for determining their position, if any, at the 2007 Final Action Hearings.

RB103: Page 1  
RB104: Page 2  
RB105: Page 3  
RB106: Page 4  
E96: Part I (IBC) – Page 6; Part II (IRC) – Page 11  
E98: Page 13

**RB103-06/07  
R312.1**

*Proposed Change as Submitted:*

**Proponent:** Rick Davidson, City of Hopkins, Minnesota

**Revise as follows:**

**R312.1 Guards.** ~~Porches, 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 shall have guards not less than 36 inches (914 mm) in height. 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.

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:** There are two editorial changes to this section. The first change separates the portion dealing with guards for stairs into a second paragraph just for simplicity. The second editorial change changes the word “which” to the more grammatically correct “that”.

The substantive change clarifies that only **required** guards must be 36 inches in height. This would make it clear that a guard of any height or design could be used on a deck that may be 12 inches above grade. The precedent for this change is found in R312.2 that states “**Required** guards on open sides...” Only required guards need meet the opening limitation requirements, not all guards. The same reasoning should apply to guard height.

A similar code change was proposed in Cincinnati but disapproved by the Committee with the following reason: “Many items are not currently regulated by the code but still should comply with the code”. The committee is in error if it believes that if something is not regulated that the code still applies?

The committee went on to say that “no technical justification was presented to specifically exempt the requirement for handrails on porches, balconies and raised floor surfaces below 30 inches in height.” The IRC specifically exempts guards in these situations in section R312.1. No additional technical justification should be needed. For a deck that is 28 inches above grade, is it not better to have a 24-inch high guard than no guard at all? Or, should a violation notice be issued for a guard that is 24 inches high with the result being removal of the guard? Common sense has to prevail here.

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

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** These two changes are basically editorial and serve to clarify that only required guards shall be not less than 36

inches in height.

**Assembly Action:**

**None**

*Individual Consideration Agenda*

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Paul K. Heilstedt, PE, Chair, ICC Code Technology Committee, requests Disapproval.**

**Commenter's Reason:** The CTC has responded to the concerns raised by the code committee in E96 Part II and is recommending approval as modified for E96. As noted by CTC in E96 and the proponent of RB103, the changes are predominately editorial. The CTC prefers the reformatting of this section, consistent with the IBC, in Parts 1 and II of E96 over the wording in RB103. However, the CTC further notes that the insertion of the word "required" in RB 103 may create a hazard. If a guard is provided, it should meet the minimum height requirements.

Final Action:

AS  
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AMPC

**RB104-06/07**

**R312.1**

*Proposed Change as Submitted:*

**Proponent:** Tom Rubottom, City of Lakewood, Colorado, representing The Colorado Chapter of ICC

**Revise as follows:**

**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. The 30 inch (762 mm) measurement will apply to any point on the grade below up to 36 inches (914 mm) laterally from the upper level.

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:** The added wording to this code section will make it clear where one would need to measure to check the allowable 30 inches before you would need to add an approved guard. This will stop the practice of having a very small portion of the grade directly below the upper level meet the 30" and then have a steep drop off immediately outside this spot. We have used the 36" dimension based on the minimum required size of landings at doors and stairs and feel it would be an adequate safe landing area in case someone fell off the upper level which would not have a guard.

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

**Committee Action:**

**Disapproved**

**Committee Reason:** The proposed language still needs to be cleaned up. There is still confusion where the 30 inch measurement is to be taken from.

**Assembly Action:**

**None**

*Individual Consideration Agenda*

**This item is on the agenda for individual consideration because public comments were submitted.**

*Public Comment 1:*



located by foundation walls.

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

**Committee Action:**

**Disapproved**

**Committee Reason:** The committee did not support stairway provisions being included in the guardrail section of the code.

**Assembly Action:**

**None**

### *Individual Consideration Agenda*

**This item is on the agenda for individual consideration because public comments were submitted.**

*Public Comment 1:*

**Tim Pate, City and County of Broomfield, Colorado, representing Colorado Chapter of ICC, requests Approval as Submitted.**

**Commenter's Reason:** The reason given by the Committee does not make any sense- "The committee did not support stairway provisions being included in the guardrail section of the code." The existing language that was struck out in this change referred to open sides of stairs already – "Open sides of stairs with a total rise of more than ..." This code change was not to include any new requirements for stairs but to change where the handrail needed to extend down to when the total rise of a stair exceeds 30". As stated in original reason – it does not make sense to require a handrail on the bottom portion of stairs (30" or less run length) when the code already has exception for requiring a guard when change of elevation is 30" or less and handrails are not required on stairs with 3 or fewer risers.

*Public Comment 2:*

**Tim Pate, City and County of Broomfield, Colorado, representing Colorado Chapter of ICC, requests Approval as Modified by this public comment.**

**Modify proposal as follows:**

**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. Those portions of open sides of stairs where the height of ~~treads~~ stairs exceeds 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.

**Commenter's Reason:** The reason given by the Committee does not make any sense- "The committee did not support stairway provisions being included in the guardrail section of the code." The existing language that was struck out in this change referred to open sides of stairs already – "Open sides of stairs with a total rise of more than ..." This code change was not to include any new requirements for stairs but to change where the handrail needed to extend down to when the total rise of a stair exceeds 30". As stated in original reason – it does not make sense to require a handrail on the bottom portion of stairs (30" or less run length) when the code already has exception for requiring a guard when change of elevation is 30" or less and handrails are not required on stairs with 3 or fewer risers.

Another concern the committee had was the original code change language seemed to imply that risers might be up to 30" high. This modification would take care of that concern.

Final Action:

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D

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AMPC

## **RB106-06/07**

### **R312.2**

*Proposed Change as Submitted:*

**Proponent:** Rick Davidson, City of Hopkins, Minnesota

**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 or ornamental closures which do not allow passage of a sphere ~~4 inches (102 mm)~~ 4 3/8 inches (107 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.~~

**Reason:** There is no reason why there should be a double standard for guard openings. The purpose of the spacing limitation is to prevent a child from getting through the guard. If 4 3/8 inches is a safe standard, it should be permitted on a landing or floor as well as the stair. This will also create more uniformity in the application of the guard rules and reduce confusion that can exist with two standards.

When the committee approved RB40-01, which changed the guard spacing for stairs, the following supporting documentation was placed in the monograph by the proponent: "Mr. William W Stewart, representing Steward-Schaberg Architects presented a similar change as RB289-99 and I add this quote from proposal RB289-99. "There is a 99 percent probability that an 10-12 month old child cannot pass through a 4-3/8 inch opening. There is a 99.8 probability that a 12-17 month old child cannot pass through a 4-3/8 inch opening. While the code should anticipate that children of all ages might be unattended on all level walking surfaces it need not provide for unsupervised 12 month old children on stairs. The principal risk to a 12-month old on a stair is the risk of falling down the stair not that of squeezing through the guard."

It is pure speculation, unsupported by any facts that children are more likely to fall through a guard on a floor than one on a stair. If the statement is true, taken to its logical conclusion means that no verticals would be required in guards for the stair at all since the child won't be there. Additionally, the proponent should have extended the greater guard spacing limits to landings as well as the stairs since a child would need to traverse the stairs, where he says they won't be, to get to the landings.

Furthermore, the argument assumes the child will always be at the top of the stairs. By age 17 months, nearly all children can negotiate stairs at least by crawling and could conceivably crawl up the stairs.

It was further argued by the proponent at the time that changing the spacing of the verticals from something around 3 inches on a stair to 4 inches on a landing "looked odd". Doesn't this argument apply to the comparison of verticals on the landings to the stairs? Of course it does.

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

**Committee Action:**

**Disapproved**

**Committee Reason:** The proponent provided insufficient technical justification to change.

**Assembly Action:**

**None**

*Individual Consideration Agenda*

**This item is on the agenda for individual consideration because public comments were submitted.**

*Public Comment 1:*

**Rick Davidson, City of Maple Grove, Minnesota, requests Approval as Submitted.**

**Commenter's Reason:** This code change would standardize the spacing requirements for openings in guards at 4 3/8 inches. The committee disapproved this proposal on a close 6-4 vote stating that insufficient technical justification was submitted. There was sufficient technical justification provided. The same argument used to increase the spacing from 4 inches to 4 3/8 inches on stairs was used. Children's heads don't change in size when they crawl from a floor to a stair or landing. There is no data to support that children are more or less likely to fall through a guard on a stair or landing or floor. Under the current rules, anytime you have a guard that transitions from a landing to a stair, you will have two intermediate spaces side by side with different special requirements, one can be no greater than 4 inches, the other no greater than 4 3/8 inches. If 4 3/8 inches is safe, which the membership has agreed based on the action to allow 4 3/8 inch spacing for guards for stairs, then it should be permitted for all applications.

*Public Comment 2:*

**Scott Dornfeld, City of Delano, Minnesota, representing Association of Minnesota Building Officials, requests Approval as Modified by this public comment.**

**Modify proposal as follows:**

**R312.2 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) ~~4 3/8 inches (107 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 inches (102 mm) to pass through.

**Commenter's Reason:** We have seen that the 4 inch spacing works at the guard railings, so then why do we want to give up on this protection on the stairs. We were able to make the 4 inch spacing work in past codes on the stair treads to maintain the minimum safety standards that the code represents. The stair builders were able to persuade the committee to change to the larger spacing. Let's keep our minimum standards and not change for the sake of curb appeal.

*Public Comment 3:*

**Todd Daniel, National Ornamental & Miscellaneous Metals Association, requests Disapproval.**

**Commenter's Reason:** The National Ornamental and Miscellaneous Metals Association (NOMMA) agrees with the Committee's decision to disapprove this change it would negate the sound reasoning established in approval of RB103-06/07. Only guards required by the code should be required to adhere to the limitations of the code. Applying limitations to guards that are not required is equivalent to enforcing a law in a jurisdiction where the law does not apply. The additional limitations may also discourage the inclusion of guards deemed necessary in special situations, but not required by the code. If no negative comments are received, then NOMMA withdraws this comment.

Final Action: AS AM AMPC\_\_\_\_\_ D

**E96-06/07, Part I**

**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)**

*Proposed Change as Submitted:*

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

**PART I – IBC MEANS OF EGRESS**

**Revise as follows:**

**SECTION 1013.0  
GUARDS**

**1013.1 Where required.** Guards shall be located along open-sided walking surfaces, including mezzanines, industrial equipment platforms, stairways, stairs, ramps and landings, that are located more than 30 inches 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.

**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.

**1013.2 Height.** Guards shall form a protective barrier not less than 42 inches (1067 mm) high, measured vertically above the adjacent walking surfaces, adjacent fixed seat-boards or the line connecting the leading edge edges of the tread-treads , adjacent walking surface or adjacent seat-board.

**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 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.
- 2- 3. The height in assembly seating areas shall be in accordance with Section 1025.14.

**1013.3 Opening limitations.** ~~Open~~ 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, 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. Screen porches.** (No change to current text)

**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 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.

**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, the CTC has held six 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.

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.

IBC 1013.1. Editorial. 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.

IBC 1013.2: The technical portion of this change is the change which identifies 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.

IBC 1013.3: 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 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:<br>6.5” | 5”                              |                                  |
| 16-19 months:<br>6.5” | 5”                              |                                  |
| 20-23 months:<br>6.8” | 5.1”                            |                                  |

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:

| <b>Country of Origin</b>             | <b>Sphere Rule Metric</b> | <b>Sphere Rule Inches</b> |
|--------------------------------------|---------------------------|---------------------------|
| 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"           |

**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.

**Committee Action:**

**Disapproved**

**Committee Reason:** Repeatedly throughout the testimony the phrase “work in progress” was used. This is a work in progress and is not ready to go into the code. Measuring a guard height from a seat board is too restrictive. At what point would you stop with items adjacent to guards (e.g. storage boxes, planters, moveable furniture). There may be some legal implications with this requirement that would not be consistent with the intent of the CTC. Section 1013.2 Exceptions 1 and 2 are redundant. There is a double negative in Section 1013.2, Exception 2.

**Assembly Action:**

**None**

*Individual Consideration Agenda*

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Paul K. Heilstedt, PE, Chair, ICC Code Technology Committee (CTC), requests Approval as Modified by this public comment for Part I.**

**Modify proposal as follows:**

**1013.1 Where required.** Guards shall be located along open-sided walking surfaces, including mezzanines, industrial equipment platforms, stairs, ramps and landings, that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches ( 914 mm) horizontally to the edge of the open side above the floor or grade below. Guards shall be adequate in strength and attachment in accordance with 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.

**1013.2 Height.** Guards shall form a protective barrier not less than 42 inches (1067 mm) high, measured vertically above the adjacent walking surfaces, adjacent fixed seat-boards or the line connecting the leading edges of the treads.

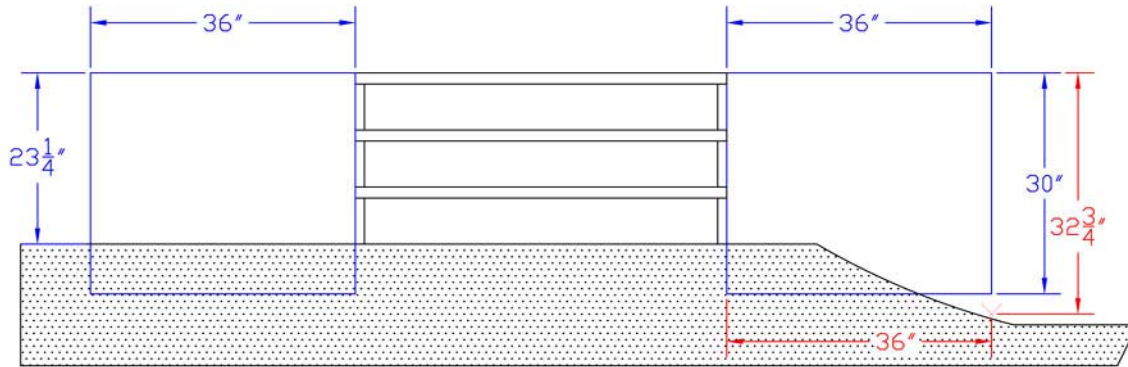
**Exceptions:**

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
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 ~~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. The height in assembly seating areas shall be in accordance with Section 1025.14.

(Portions of proposal not shown remain unchanged)

**Committer's Reason:** The code change committee sites in their reason that this issue is a "work in progress". While this is true regarding the CTC's review of the subject of climbable guards as far as testing, the CTC has concluded its review and solicitation of comments on the subject matter included in this proposal. The following revisions are proposed in response to the code committees concerns:

IBC 1013.1 Height measurement: This public comment 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 "Seat board" terminology: This public comment revises the term to "fixed seating" so as to clarify the measurement, using common terminology. Fixed seating represents a walking surface which 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 1013.2 Redundant exceptions: The 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.

IBC 1013.2 Exception 2 - Double negative: This was inadvertent. The public comment deletes the word "not" in Exception 2 to Section 1013.2.

Final Action:                    AS                    AM                    AMPC \_\_\_\_                    D

# E96-06/07, Part II

## IRC R312.1, R312.2 (New), R312.2

*Proposed Change as Submitted:*

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

### PART II – IRC

#### SECTION R312 GUARDS

**R312.1 Where Guards required.** ~~Porches, balconies, ramps or raised walking floor surfaces located more than 30 inches above the floor or grade below shall have guards not 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 porches, decks, balconies, mezzanines, stairs, ramps and landings, which are located more than 30 inches (762 mm) above the floor or grade below. 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.** 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 seat-boards 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.

**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 are 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 43/8 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, the CTC has held six 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.

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.

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.

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. This section does include an added phrase - "or adjacent seatboard" – 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.

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.

**Committee Action:**

**Disapproved**

**Committee Reason:** The proposed language would increase the scope of this section to include any walking surface greater than 30 inches above the floor or grade. This would be over restrictive and would also cause an issue with seat boards.

**Assembly Action:**

**None**

*Individual Consideration Agenda*

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Paul K. Heilstedt, P.E., Chair, ICC Code Technology Committee (CTC), requests Approval as Modified by this public comment.**

**Modify proposal as follows:**

**R312.1 Where required.** 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 (762 mm) ~~above the floor or grade below~~ 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.

**R312.2 Height.** 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 ~~seat boards~~ seating or the line connecting the leading edges of the treads.

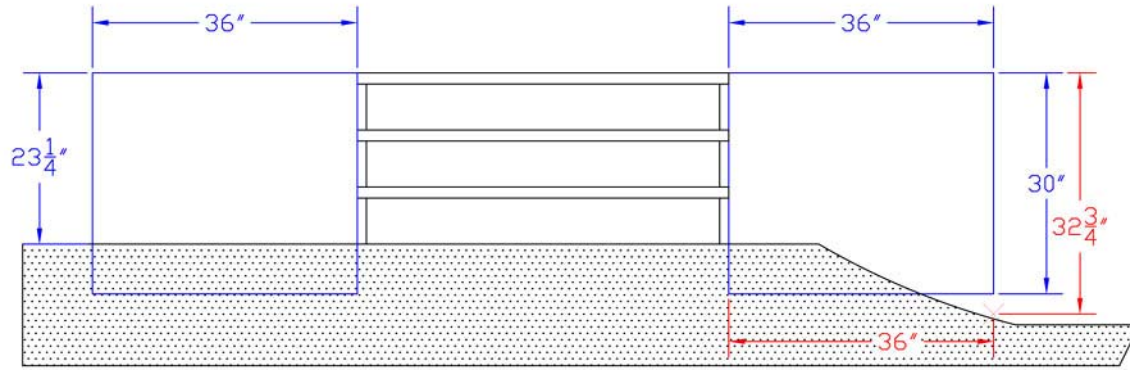
**Exceptions:**

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.

(Portions of proposal not shown remain unchanged)

**Commenter's Reason:** The code change committee sites in their reason that this issue is a "work in progress". While this is true regarding the CTC's review of the subject of climbable guards as far as testing, the CTC has concluded its review and solicitation of comments on the subject matter included in this proposal. The following revisions are proposed in response to the code committees concerns:

IRC R312.2 Height measurement: This public comment 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 figures:



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



R312.2 "Seat board" terminology: This public comment revises the term to "fixed seating" so as to clarify the measurement, using common terminology. Fixed seating represents a walking surface which 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.

R312.2 Redundant exceptions: The 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.

Final Action: AS AM AMPC \_\_\_ D

## E98-06/07

### 1013.2 (IFC [B] 1013.2)

*Proposed Change as Submitted:*

**Proponent:** Thomas Kinsman, T. A. Kinsman Consulting Company

**Revise as follows:**

**1013.2 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~~. Guards in

grandstands, bleachers, and folding and telescopic seating shall comply with ICC 300.

**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.
2. The height in assembly seating areas shall be in accordance with Section 1025.14.

**Reason:** The purpose of this code change is to delete the reference to "seatboards" which is understood to be an undefined term previously used in at least one legacy code for addressing guards in grandstands and bleachers. Grandstands, bleachers, etc. are addressed in ICC 300 as currently referenced in 1025.1.1. In the 2002 edition of the ICC 300, the successor term for "seatboard" is "bench seat".

The reason for the code change is to clarify the current code intends that "seatboards" are associated with grandstands, bleachers, etc. and not for benches used for sitting that may be adjacent to a guardrail. With the term "seatboard" undefined, the intent is not clear. The cross reference to ICC 300 refers the code user to the standard where such features are addressed.

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

**Analysis:** A question would be if the proposed additional sentence would be better located as an exception for consistency with Exception 2 since both are related to types of fixed seating.

**Committee Action:**

**Disapproved**

**Committee Reason:** In one of the legacy codes "seatboard" was the top row of a bleacher, not a bench. In the current text, this is not clear, so this is an issue that needs to be addressed. However, deletion of the term with only a reference to the ICC 300 standard would not address the similar safety issue found in other tiered seating arrangements.

**Assembly Action:**

**None**

*Individual Consideration Agenda*

**This item is on the agenda for individual consideration because a public comment was submitted.**

*Public Comment:*

**Thomas Kinsman, T.A. Kinsman Consulting Company, requests Approval as Modified by this public comment.**

**Modify proposal as follows:**

**1013.2 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 seat board~~.

**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.
2. The height in assembly seating areas shall be in accordance with Section 1025.14.

**Commenter's Reason:** The modified proposal deletes the term "adjacent seat board" because it is an undefined term and therefore causes an unwarranted high liability exposure for design professionals and others in the construction industry. This is the main intent of the proposal.

The modification deletes any reference to ICC 300 which was part of the original proposal. It was originally understood from staff that the term "seat board" related to facilities such as bleachers, grandstands, folding seating, etc. As a result, the ICC 300 document was considered to be the best home for such regulation. However some of the proponents of the comprehensive guard proposal (CTC's E96-06/07) believe the term applies in many instances beyond those covered by the ICC 300 document. If proponents include clear definition of seat boards in the code (via modification to E96 or other proposal) to the satisfaction of the committee, then the underlying concern of E98-06/07 is resolved. In the interim, the code should not contain such undefined terms.

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