

# Code Technology Committee 2010 Final Action Agenda Child Window Safety

The following are code changes and public comments to be considered at the 2010 Dallas Final Action Hearings that are related to the CTC Area of Study noted above.

RB122, Part I & II – Page 1  
RB123, Part II – Page 7

---

## RB122-09/10, Part I R612.2

### Proposed Change as Submitted

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

#### **PART I – IRC BUILDING/ENERGY**

##### **Revise as follows:**

**R612.2 Window sills.** In *dwelling* units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished *grade* or surface below, the lowest part of the clear opening of the window shall be a minimum of ~~24~~ 36 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4 inch (102 mm) diameter sphere where such openings are located within ~~24~~ 36 inches (610 mm) of the finished floor.

##### **Exceptions:**

1. Windows whose openings will not allow a 4-inch diameter(102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. Openings that are provided with window fall prevention devices that comply with Section R612.3.
3. Openings that are provided with fall prevention devices that comply with ASTM F 2090.
4. Windows that are provided with opening limiting devices that comply with Section R612.4.

**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 seventeen meetings - all open to the public.

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

Study the incidence and mechanisms of falls from open windows by children and to investigate the necessity and suitability of potential safeguards and/or revisions to the current codes.

The intent of IBC Section 1405.13.2 and IRC Section R612.2 is clearly to provide safety mechanisms to reduce the possibility of children falling through a window. The CTC has determined that this can be realized in the code in three ways: window fall prevention devices; window opening control devices; or reducing the possibility of accessing the window by increasing the sill height. The purpose of this code change is to reduce the potential hazard by increasing the sill height from 24 inches to 36 inches.

In response to the CTC studying the Climbability of Guards, the National Ornamental & Miscellaneous Metals Association (NOMMA) commissioned a paper entitled “Review of Fall Safety of Children Between the Ages of 18 months and 4 Years in Relation to Guards and Climbing in the Built Environment”, referred to in this code change as “NOMMA paper”. This paper is posted on the CTC website as noted below. The paper provides a summary of the building code requirements, a critical review of relevant per-reviewed scientific literature on guard research and injury data and includes a section entitled “Children’s Interaction with the Built Environment”. Included in this section is an analysis of falls from windows where it is noted that “Falls from windows are among the most common types of unintended injuries to children and they are a major health concern” (NOMMA paper page 30). The study efficiently places within a few pages the data on window fall incidents and the means of reducing the number of incidents.

##### **U.S. Fall Injury Data**

NOMMA report page 7: The 1,421,137 injuries reported by NEISS between 2002 and 2005, inclusive, correspond to a national average of 51,217,603 based on weighting data included with the record data. The average over the four years is 12,804,401. The weighted estimate of 1,117,278 incidents on average annually for children between the ages of 18 months and 4 years represents 8.7 percent of these incidents. For all the incidents to children between the ages of 18 months and 4 years, 5.6 percent involved stairs, 1.22 percent involved windows, and 0.87 percent involved porches, balconies, open-sided floors, and floor openings.

NOMMA paper page 30 – 33. The paper further cites reports which have been compiled in the table below:

Study	Location	Falls	% fatalities
Vish et al. (2005)	Chicago	11/yr	
Istre et al. (2003)	Dallas county	17/yr	
Benoit et al. (2002)	L.A. county	12/yr (11% )	4% (4 yrs old or less)
Stone et al. (2000)	Cincinnati	12/yr (6.3% )	4.7%
Benoit et al. (2000)	Northern Virginia	11/yr (11%)	

### Center of Gravity

NOMMA paper page 11, Table 2: The standing center of gravity of children aged 2 to 3.5 years is 24.1 inches (50<sup>th</sup> percentile is 22.2 inches) and of children aged 3.5 to 4.5 is 25.2 (50<sup>th</sup> percentile is 23.6).

A reasonable expectation for the Code is that, absent any fall protection in the window opening, a minimum sill height will be required to reduce the ability of a child to climb onto the sill enabling the fall through the opening. Using a child target age of up to 4 years of age and the associated center of gravity, the code mandated height of 24" is not adequate. A child need only extend themselves on their toes, stand on modest stack of books or blocks or hoist themselves a matter of a few inches with their arms to be able to flop onto the sill and expose themselves to the window opening and the associated risk of falling.

The hazards associated with child window falls cannot be understated as evidenced by the following CPSC Press release dated May 15, 2008:

NEWS from CPSC  
 U.S. Consumer Product Safety Commission  
 Office of Information and Public Affairs Washington, DC 20207

FOR IMMEDIATE RELEASE  
 May 15, 2008  
 Release #08-270

CPSC Hotline: (800) 638-2772  
 CPSC Media Contact: (301) 504-7908

### Window Falls Prompts CPSC to Issue Warning

WASHINGTON, D.C. - With the arrival of the warmer spring weather, families across the nation are opening their windows to let the fresh air in. This pleasant feeling can quickly turn tragic in households with small children. In recent weeks, several children have fallen from windows. The U.S. Consumer Product Safety Commission is warning parents and caregivers to take precautions to keep children from falling from windows.

"CPSC staff is aware of at least 18 falls from windows through media reports, including two deaths, involving small children since April," said CPSC Acting Chairman Nancy Nord. "We are issuing this warning so parents will take the necessary steps to prevent these incidents from happening."

These deaths and injuries frequently occur when kids push themselves against window screens or climb onto furniture located next to an open window.

From 2002-2004, CPSC staff received an average of 25 reports a year of fatalities associated with falls from windows. Children younger than five years of age account for approximately one-third of these reported fatalities. For all age categories, more males died from window falls than females.

To help prevent injuries and tragedies, CPSC recommends the following safety tips:

- \* Safeguard your children by using window guards or window stops.
- \* Install window guards to prevent children from falling out of windows. (For windows on the 6th floor and below, install window guards that adults and older children can open easily in case of fire.)
- \* Install window stops so that windows open no more than 4 inches.
- \* Never depend on screens to keep children from falling out of windows.
- \* Whenever possible, open windows from the top -- not the bottom.
- \* Keep furniture away from windows, to discourage children from climbing near windows.

To see this release on CPSC's web site, please go to:  
<http://www.cpsc.gov/cpscpub/prere/phtml08/08270.html>

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

ICCFILENAME: HEILSTEDT-RB-2-R612-IBC 1405.13.2

## Public Hearing Results

### PART I – IRC

**Committee Action:****Disapproved**

**Committee Reason:** The committee feels the 24 inch height has not been in use long enough to accumulate needed data to justify a change to 36 inches.

**Assembly Action:****None**

---

### Individual Consideration Agenda

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

*Public Comment 1:*

**Paul K. Heilstedt, P.E., Hon. AIA, Chair, ICC Code Technology Committee (CTC), requests Approval as Submitted.**

**Commenter's Reason:** This code change proposal included two parts, one to the IRC (part 1) and one to the IBC (part 2), to increase the minimum sill height for windows from 24" to 36". Part 2 to the IBC was approved. In approving the code change to the IBC, the committee noted "...increasing the current 24 inch sill height requirement to 36 inches was justified by the data submitted by the proponent."

This public comment coordinates the requirements between the IRC and the IBC. The focus of this change is to provide for the safety of children that are accidentally injured and killed each year due to falls through windows. The window industry has illustrated its ability to provide the type of barrier that can easily offer the level of protection needed to prevent such accidents. CTC does not pretend that this will prevent children from falling from windows that are higher than this 36" threshold because they or others provide opportunities to climb. This doesn't mean we shouldn't establish rational thresholds that would avoid the accidental fall from windows as we have with guards.

*Public Comment 2:*

**Gregory R. Istre, M.D., Injury Prevention Center of Greater Dallas, requests Approval as Submitted.**

**Commenter's Reason:** I am writing in support of the proposal to change "RB 122" to set a minimum height of 36" for window sills in dwelling units. Our organization (the Injury Prevention Center of Greater Dallas), in collaboration with the Texas Department of Health, undertook a three-year study of children who had fallen from heights, in Dallas, Texas, and the data from that study support a mandate for a minimum height of window sills<sup>1</sup>. We found that 89% of the children who fell from a window had fallen directly out of a window whose sill was within 3 feet of the floor. In each case the windows were open and most had a screen, but the screens did not prevent the fall. Also, in almost every case, we found that a parent had been supervising the child but they could not prevent the fall. Our study concludes that most of the falls could have been prevented if either the window sills had been higher off the floor or if the windows had been manufactured to not open far enough to allow a child to pass through the opening.

I am aware that the current number in the code since 2006 is 24", which will go a long way toward decreasing window fall-related injuries to children. By our calculations from our data, ~75% of these falls may be prevented by having minimum sill height of 24", which is the current building standard, and an additional ~15% of falls could be prevented by raising the minimum sill height requirement to 36".

I am aware of Mr. Sealy's work for the past several years and have studied his current proposal, and am convinced that implementation of this code change will go a long way in preventing window fall-related injuries to children.-Gregory Istre, M.D.2/8/2010

**Bibliography:**

1) Istre, et al. "Childhood injuries due to falls from apartment windows and balconies" *Injury Prevention* 2003;9:349-352.

*Public Comment 3:*

**Jim. W. Sealy, FAIA representing self, requests Approval as Submitted.**

**Commenter's Reason:** This process began for me in early 2000 when I became involved in a legal action involving a toddler falling from an open window in his third floor apartment. During the course of my work I did a lot of research in window placement and falls from windows involving children. As a result of my work, I submitted a proposed change to both the IBC and IRC whereby windowsills would be required to be a minimum distance (36") above the finished floor of the room in which the window is located.

All of the technical requirements in my proposals were based on existing code language and none of it was arbitrary or contrived. My first proposals were submitted in 2002 and both failed because of objections from the window industry and homebuilders and building designers; with the 36" sill height being the major concern on their part. In the following cycle, I resubmitted both proposals and ultimately made concessions to the opposition and I accepted a sill height of 24". However, that height had no logical basis and had not been researched or studied – it was merely a concession on my part.

Both committees approved the section with the 24" height in the first part of the cycle and they were also approved in the final hearings held in Overland Park, Kansas. HOWEVER, in order to delay the section from going into the 2003 edition of the codes, one of the opponents filed a "formal challenge". I continued my mission and I ultimately received approval of the modified section and it was printed in the 2006 edition of the codes.

Subsequently the ICC Code Technology Committee (CTC) began to study the sections dealing with this issue and they submitted code changes to resurrect my original proposals on the windowsills being positioned at 36" above the floor. They concluded that logic and outside studies confirmed my original premise and they have been successful in getting the 36" height passed by the IBC committee at the hearings in Baltimore. However, the IRC committee is still reluctant to accept logic and stated that the 24" height has not been in the codes long enough to determine its effectiveness.

The 24" dimension was purely arbitrary and was nothing more than a concession made to get something in the code. The 36" dimension, on the other hand, was and still is based on logic and has been proven in the codes for decades. In summary, the 36" height is justifiable and no lengthy

study or research is necessary. It has been in the codes for decades and has not been challenged. In my opinion, this is proof that the 24" height is unacceptable in addressing the problem of children falling from windows and further proof that Approval As Submitted is the correct action for RB 122 09/10 Part 1.

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

**RB122-09/10, Part II**  
**IBC 1405.13.2**

**Proposed Change as Submitted**

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

**PART II – IBC FIRE SAFETY**

**Revise as follows:**

**1405.13.2 Window sills.** In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be at a height not less than 24 36 inches (610 mm) above the finished floor surface of the room in which the window is located. Glazing between the floor and a height of 24 36 inches (610 mm) shall be fixed or have openings through which a 4-inch (102 mm) diameter sphere cannot pass.

**Exception:** Openings that are provided with window guards that comply with ASTM F 2006 or F 2090.

**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 seventeen meetings - all open to the public.

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

Study the incidence and mechanisms of falls from open windows by children and to investigate the necessity and suitability of potential safeguards and/or revisions to the current codes.

The intent of IBC Section 1405.13.2 and IRC Section R612.2 is clearly to provide safety mechanisms to reduce the possibility of children falling through a window. The CTC has determined that this can be realized in the code in three ways: window fall prevention devices; window opening control devices; or reducing the possibility of accessing the window by increasing the minimum sill height. The purpose of this code change is to reduce the potential hazard by increasing the sill height from 24 inches to 36 inches.

In response to the CTC studying the Climability of Guards, the National Ornamental & Miscellaneous Metals Association (NOMMA) commissioned a paper entitled "Review of Fall Safety of Children Between the Ages of 18 months and 4 Years in Relation to Guards and Climbing in the Built Environment", referred to in this code change as "NOMMA paper". This paper is posted on the CTC website as noted below. The paper provides a summary of the building code requirements, a critical review of relevant per-reviewed scientific literature on guard research and injury data and includes a section entitled "Children's Interaction with the Built Environment". Included in this section is an analysis of falls from windows where it is noted that "Falls from windows are among the most common types of unintended injuries to children and they are a major health concern" (NOMMA paper page 30). The study efficiently places within a few pages the data on window fall incidents and the means of reducing the number of incidents.

**U.S. Fall Injury Data**

NOMMA report page 7: The 1,421,137 injuries reported by NEISS between 2002 and 2005, inclusive, correspond to a national average of 51,217,603 based on weighting data included with the record data. The average over the four years is 12,804,401. The weighted estimate of 1,117,278 incidents on average annually for children between the ages of 18 months and 4 years represents 8.7 percent of these incidents. For all the incidents to children between the ages of 18 months and 4 years, 5.6 percent involved stairs, 1.22 percent involved windows, and 0.87 percent involved porches, balconies, open-sided floors, and floor openings.

NOMMA paper page 30 – 33. The paper further cites reports which have been compiled in the table below:

Study	Location	Falls	% fatalities
Vish et al. (2005)	Chicago	11/yr	
Istre et al. (2003)	Dallas county	17/yr	
Benoit et al. (2002)	L.A. county	12/yr (11% )	4% (4 yrs old or less)
Stone et al. (2000)	Cincinnati	12/yr (6.3% )	4.7%

Benoit et al. (2000)	Northern Virginia	11/yr (11%)	
----------------------	-------------------	-------------	--

**Center of Gravity**

NOMMA paper page 11, Table 2: The standing center of gravity of children aged 2 to 3.5 years is 24.1 inches (50<sup>th</sup> percentile is 22.2 inches) and of children aged 3.5 to 4.5 is 25.2 (50<sup>th</sup> percentile is 23.6).

A reasonable expectation for the Code is that, absent any fall protection in the window opening, a minimum sill height will be required to reduce the ability of a child to climb onto the sill enabling the fall through the opening. Using a child target age of up to 4 years of age and the associated center of gravity, the code mandated height of 24" is not adequate. A child need only extend themselves on their toes, stand on modest stack of books or blocks or hoist themselves a matter of a few inches with their arms to be able to flop onto the sill and expose themselves to the window opening and the associated risk of falling.

The hazards associated with child window falls cannot be understated as evidenced by the following CPSC Press release dated May 15, 2008:

NEWS from CPSC  
 U.S. Consumer Product Safety Commission  
 Office of Information and Public Affairs Washington, DC 20207

FOR IMMEDIATE RELEASE  
 May 15, 2008  
 Release #08-270

CPSC Hotline: (800) 638-2772  
 CPSC Media Contact: (301) 504-7908

**Window Falls Prompts CPSC to Issue Warning**

WASHINGTON, D.C. - With the arrival of the warmer spring weather, families across the nation are opening their windows to let the fresh air in. This pleasant feeling can quickly turn tragic in households with small children. In recent weeks, several children have fallen from windows. The U.S. Consumer Product Safety Commission is warning parents and caregivers to take precautions to keep children from falling from windows.

"CPSC staff is aware of at least 18 falls from windows through media reports, including two deaths, involving small children since April," said CPSC Acting Chairman Nancy Nord. "We are issuing this warning so parents will take the necessary steps to prevent these incidents from happening."

These deaths and injuries frequently occur when kids push themselves against window screens or climb onto furniture located next to an open window.

From 2002-2004, CPSC staff received an average of 25 reports a year of fatalities associated with falls from windows. Children younger than five years of age account for approximately one-third of these reported fatalities. For all age categories, more males died from window falls than females.

To help prevent injuries and tragedies, CPSC recommends the following safety tips:

- \* Safeguard your children by using window guards or window stops.
- \* Install window guards to prevent children from falling out of windows. (For windows on the 6th floor and below, install window guards that adults and older children can open easily in case of fire.)
- \* Install window stops so that windows open no more than 4 inches.
- \* Never depend on screens to keep children from falling out of windows.
- \* Whenever possible, open windows from the top -- not the bottom.
- \* Keep furniture away from windows, to discourage children from climbing near windows.

To see this release on CPSC's web site, please go to:  
<http://www.cpsc.gov/cpsc/pub/prerelease/prhtml08/08270.html>

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

ICCFILENAME: HEILSTEDT-RB-2-R612-IBC 1405.13.2

**Public Hearing Results**

**PART II - IBC Fire Safety**

**Committee Action:**

**Approved as Submitted**

**Committee Reason:** The committee agreed that increasing the current 24 inch sill height requirement to 36 inches was justified by the data submitted by the proponent.

**Assembly Action:**

**None**

**Individual Consideration Agenda**

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

*Public Comment 1:*

**Jeff Inks, Window and Door Manufacturer's Association, requests Disapproval.**

**Commenter's Reason:** First, the ICC CTC has determined that the intent of 1405.13.2 can be met in three ways: window fall prevention devices; window opening control devices; or reducing the possibility of accessing the window by increasing the minimum sill height.

All three of those ways are already provided for in the current code as a result of the long debate that led to the inclusion of the 24" requirement in the 2006 edition of the IBC. There is no adequate justification to further increase the height of the sills other than what we believe is a subjective determination by the CTC based upon a paper – not actual research -- that did not focus on window sill heights, but rather on climbable guards.

The "NOMMA paper" cited as the justification for proposing a minimum 36" sill height is in fact just a review which is clearly declared by its authors in the abstract that the paper who state that the paper, "provides a summary of the building code requirements, a critical review of relevant peer-reviewed scientific literature on guard research and injury data related to children's climbing, and an analysis of the latest injury statistics."

The paper was not commissioned nor is it intended to serve as the bases for building code requirements and there is nothing to suggest that it should. This too is clearly declared by the authors who expressly stated in the Executive Summary that the "Results from either the research studies or the injury data are neither specific enough nor consistent enough to constitute a solid basis for building code requirements."

The authors go even further with respect to the injury data in the report by stating that "Caution should be used in applying the NEISS data to assign causation of an event. The designations provided in the NEISS reporting system focus on "product codes" and not on the mechanism or physical environment surrounding the injury." A copy of the report is available at [http://www.iccsafe.org/cs/CTC/Documents/guards/resource/NOMMA\\_Final\\_Report\\_20080506R\\_May\\_08.pdf](http://www.iccsafe.org/cs/CTC/Documents/guards/resource/NOMMA_Final_Report_20080506R_May_08.pdf)

If the authors of the report that is being used as the basis for approving this code change are adding such caveats for their own work, we believe that makes it clear that the report is not intended to serve as the basis for establishing building code requirements.

Second, the proponents reason statement goes on to state that with respect to the current 24" requirement "a child need only extend themselves on their toes, stand on modest stack of books or blocks or hoist themselves a matter of a few inches with their arms to be able to flop onto the sill and expose themselves to the window opening and the associated risk of falling." All of the factors cited in that statement as contributing to falls are factors that don't go away by raising the sill height, and there is no sound data to substantiate that raising the sill height further than 24" will result in a reduction of child falls. Equally concerning is the lack of consideration given to the potential for higher sill heights to actually encourage the placement of climbable/stepable objects or furniture near or under the window making the sill even more accessible. One can equally conclude from intuitive reasoning that there is a greater likelihood of this occurring the higher the sill height is. In fact, this could also encourage a child to climb to see out the window regardless of whether there are climbable/stepable objects available.

Regardless, those factors are precisely why most child safety advocacy organizations focus their fall prevention guidance on things such as keeping windows closed in rooms where children play, ensuring appropriate supervision, opening windows from the top, avoiding the placement of furniture and other climbable objects near the window, etc.

All of those factors are outside the control of the building code. We therefore do not believe that increasing the sill height to 36" will have a meaningful impact on reducing child falls. Promoting window safety awareness does however have a proven, meaningful impact versus a minimum 36" sill height and we therefore urge disapproval of it.

### *Public Comment 2:*

#### **Tim Pate, representing, City & County of Broomfield, CO, representing Colorado Chapter of ICC, requests Disapproval.**

**Commenter's Reason:** This public comment is asking for the membership to overturn the IBC Fire Safety Committee and disapprove this code change. The IRC-Building/Energy Committee disapproved this same code change due to lack of any substantial data to show that the requirement for this sill height at 24" minimum which was put into the 2006 IBC and IRC has been effective in stopping child falls out of windows.

We need to wait until there is sufficient data to show that the 24" is not working (or even helping) before raising the number any higher. The original proponent himself stated that a child need only extend themselves on their toes, stand on modest stack of books or blocks or hoist themselves a matter of a few inches with their arms to be able to flop onto the sill and expose themselves to the window opening and the associated risk of falling.

Raising the window sill to 36" will only require the same child to stack up a higher stack of books or blocks and potentially fall out. There would even be a potentially higher risk of having an end table pushed up to the exterior wall in these locations and therefore make it even easier for child to get on top of and potentially fall out. Nowhere in the CPSC list of recommendations that the proponent has shown in original reason statement does it say to have a higher window sill. It does say to keep furniture away and use window stops and guards.

### *Public Comment 3:*

#### **Julie Ruth, JRuth Code Consulting, representing American Architectural Manufacturer's Association, requests Disapproval.**

**Commenter's Reason:** RB122, Part II raises the minimum height required to the lowest part of the clear opening of an operable window from 24 inches to 36 inches in the IBC. The stated intent of doing so, by the proponent, is to reduce the risk of children falling through the open window. AAMA opposes this increase in the minimum sill height requirements of the IBC for the following reasons:

1. No evidence has been presented that establishing any minimum sill height, or raising that height, will prevent or reduce the number of **children who fall through windows each year**. The proponent of RB122 points to a study that was conducted by the National Ornamental and Miscellaneous Metals Association (NOMMA) regarding the ability of children to climb over guard rails as evidence of the need to raise the minimum sill height. The results of that study, which was conducted for NOMMA by the National Association of Home Builders Research Center, were published in a paper entitled "Review of Fall Safety of Children Between the Ages of 18 months and 4 Years in Relation to Guards and Climbing in the Built Environment".

The study itself does not make any recommendations regarding an effective barrier height for young children. In fact, the Executive Summary includes the following statement. "Results from either the research studies or the injury data are neither specific enough nor consistent enough to constitute a solid basis for building code requirements."

Another result from the study, however, was consistent with a viewpoint that the fenestration industry has expressed many times as the dialog regarding the establishment of minimum sill heights has continued. That view is that children climb. The specific statement from the Executive Summary of the NOMMA report is: "Research shows that climbing plays an important role in the physical, cognitive, and social development of the young child, and that this is encouraged in many situations, such as playgrounds and school gymnasias."

Within the body of the report, the topic of children's climbing abilities is further expanded. "Children begin to practice climbing skills early in life. Many children learn rudimentary climbing before they begin to walk and climbing has been observed as early as 8 months of age (McGraw, 1935, cited in Readdick and Park, 1998). By around one year a child is able to pull himself up onto a ledge or table. By the age of 13 months many children have started walking unaided. By 14 months 25 percent of children are climbing, and this rises to 50 percent by 17 months (Readdick and Park, 1998). At 21 months 75 percent of children are climbing and 90 percent or more are climbing by 22 months of age (ibid.). By 4 years of age boys have started to develop greater upper body strength than girls. By the age of 6 years many children can begin to climb in a manner similar to an adult (van Herrewegen, Molenbroek and Goossens, 2004). As a consequence of these developmental processes, the acquisition of climbing skills mostly occurs between 3 and 6 years of age (van Herrewegen

et al., 2004).”

Given children’s documented ability to climb, it would not be realistic to expect a barrier of any height to be sufficient to prevent a child from going over it, unless the establishment of such a barrier were accompanied by a ban on the placement of any object adjacent to that barrier that might facilitate climbing, at any time during the occupancy of the building. This of course would be unenforceable. A previous review of window fall reports received from the Consumer Product Safety Commission indicates that in some instances children move objects, such as toys, Styrofoam coolers, pillows and small pieces of furniture, to enable themselves to climb to the sill height. It then becomes obvious that the establishment of a barrier of any height could still be overcome by a child who wishes to satisfy their own curiosity about what is going on outside the room they are in.

**2. Raising the sill height could have the effect of raising the height from which children fall.** Since we understand that children can and will climb, if we raise the height of the sill we are in essence raising the height they need to climb to if their objective is to see outside the window. By doing so, we also raise the height from which they may fall, both to the exterior of the building, and to the interior. This obviously increases the risk of injury to the child, rather than reducing it.

**3. Raising the sill height would definitely make it more difficult for other occupants of the building to egress from the building through an open window.** Although children can climb over barriers of great height, relative to their own, other occupants of the building may have difficulty doing so. This is particularly true of elderly, or the disabled. The likelihood of this, and the percentage of the population who could not overcome a barrier, increases as the height of the barrier does. Therefore, establishing any minimum sill height merely puts in place a barrier that may not reduce the number of children that fall through the window while increasing the likelihood that other occupants of the building will not be able to egress the building through that opening. Raising the height makes that situation worse – it does not improve it.

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

---

## RB123-09/10-PART II

### IBC 1405.13.2, 1405.13.2.1 (New)

**NOTE: PART I DID NOT RECEIVE A PUBLIC COMMENT AND IS ON THE CONSENT AGENDA. PART I IS REPRODUCED ONLY FOR INFORMATIONAL PURPOSES ONLY FOLLOWING ALL OF PART II.**

#### Proposed Change as Submitted

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

#### **PART II – IBC FIRE SAFETY**

##### **1. Revise as follows:**

**1405.13.2 Window sills.** In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor surface of the room in which the window is located. ~~Glazing between the floor and a height of 24 inches (610 mm) shall be fixed or have openings such that a 4-inch (102 mm) diameter sphere cannot pass through.~~ Operable sections of windows shall not permit openings that allow passage of a 4 inch diameter sphere where such openings are located within 24 inches of the finished floor.

##### **Exceptions:**

- ~~Openings that are provided with window guards that comply with ASTM F 2006 or F 2090.~~
1. Windows whose openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
  2. Openings that are provided with window fall prevention devices that comply with ASTM F 2090.
  3. Windows that are provided with window opening control devices that comply with Section 1405.13.2.1..

##### **2. Add new text as follows:**

**1405.13.2.1 Window opening control devices.** When required elsewhere in this code, window opening control devices shall comply with ASTM F 2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section 1029.2. The device or any portion thereof shall not project more than 1 inch into the required net clear opening for a length not exceeding 3 inches when the window is in the fully open position.

**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 seventeen meetings - all open to the public. This proposed change is a result of the CTC’s investigation of the area of study entitled “Child Window Safety”. The scope of the activity is noted as:

Study the incidence and mechanisms of falls from open windows by children and to investigate the necessity and suitability of potential safeguards and/or revisions to the current codes.

This code change is a follow-up to code change RB173-07/08 last cycle. At the Final Action Hearings in Minneapolis, the membership approved RB 173-07/08 Part 1 (Public Comment 2) to the IRC to include prescriptive provisions for window opening limiting devices but failed to approve the

corresponding and identical provisions to the IBC. The proposal corrects this inconsistent action as well as replaces the prescriptive provisions with a reference to a consensus standard which has been updated to specifically address these devices.

IBC/IRC coordination: The result of this two part code change will be consistency between the IBC and IRC in terms of requirements. Updated standard ASTM F2090 – 08: Both the IBC and IRC currently reference the 2007 edition of the standard entitled “Specification for Window Fall Prevention Devices with Emergency Escape (Egress Release Mechanisms)”. This standard was updated in 2008 to address window opening control devices. However, it was not updated in time to be included by reference in the 2009 IBC and IRC. This standard includes the necessary window operational criteria which results in the window not being able to be opened beyond the 4 inch performance threshold which is currently found in IRC Section R612.4.1. This control device can be released to allow the window to be fully opened in order to comply with the emergency escape provisions in both the IBC (1029.2) and IRC (R310.1.1)

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

ICCFILENAME: HEILSTEDT-RB-1-R612-IBC 1405.13.2

**Public Hearing Results**

**PART II - IBC Fire Safety Committee Action:**

**Approved as Modified**

**Modify the proposal as follows:**

**1405.13.2.1 Window opening control devices.** ~~When required elsewhere in this code, window opening control devices shall comply with ASTM F 2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section 1029.2. The device or any portion thereof shall not project more than 1 inch into the required net clear opening for a length not exceeding 3 inches when the window is in the fully open position.~~

*(Portions of the proposal not shown remain unchanged)*

**Committee Reason:** The committee agreed that it was appropriate to have consistency between the IRC and the IBC with respect to the provisions for window sills and window opening control devices. The modification appropriately removes projection requirements that have not been justified.

**Assembly Action:**

**None**

**Individual Consideration Agenda**

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

*Public Comment:*

**Jeff Inks, Window and Door Manufacturer’s Association, requests Approved as Modified by this public comment.**

**Modify the proposal as follows:**

**1405.13.2 Window sills.** In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor surface of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4 inch diameter sphere where such openings are located within 24 inches of the finished floor.

**Exceptions:**

1. Windows whose openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. Openings that are provided with window fall prevention devices that comply with ASTM F 2090.
3. Windows that are provided with window opening control devices that comply with Section ~~4405.13.2.4~~ 1405.13.3.

**~~1405.13.2.4~~ 1404.13.3 Window opening control devices.** Window opening control devices shall comply with ASTM F 2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section 1029.2.

**Commenter’s Reason:** This change in the section number formatting is intended to ensure that all window opening control devices, regardless of whether or not they are used to serve as an exception to the sill height requirement, meet ASTM F2090.

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

**NOTE: PART I REPRODUCED FOR INFORMATIONAL PURPOSES ONLY – SEE ABOVE**

**PART I – IRC BUILDING/ENERGY**

**1. Revise as follows:**

**R612.2 Window sills.** In dwelling units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished grade or surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4 inch diameter sphere where such openings are located within 24 inches of the finished floor.



**Exceptions:**

1. Windows whose openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
- ~~2. Openings that are provided with window fall prevention devices that comply with Section R612.3.~~
3. Openings that are provided with window fall prevention devices that comply with ASTM F 2090.
4. Windows that are provided with window opening limiting control devices that comply with ~~Section R612.4, R612.3.~~

**2. Delete without substitution:**

~~**R612.3 Window fall prevention devices.** Window fall prevention devices and window guards, where provided, shall comply with the requirements of ASTM F 2090.~~

**3. Renumber and revise Section R612.4 as follows:**

~~**R612.4 R612.3 Window opening limiting control devices.** When required elsewhere in this code, window opening limiting control devices shall comply with the provisions of this section, ASTM F 2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section R 310.1.1. The device or any portion thereof shall not project more than 1 inch into the required net clear opening for a length not exceeding 3 inches when the window is in the fully open position.~~

**4. Delete without substitution:**

~~**R612.4.1 General requirements.** Window opening limiting devices shall be self-acting and shall be positioned so as to prohibit the free passage of a 4.0-in. (102-mm) diameter rigid sphere through the window opening when the window opening limiting device is installed in accordance with the manufacturer's instructions.~~

~~**R612.4.2 Operation for Emergency Escape.** Window opening limiting devices shall be designed with release mechanisms to allow for emergency escape through the window opening without the need for keys, tools or special knowledge. Window opening limiting devices shall comply with all of the following:~~

- ~~1. Release of the window opening limiting device shall require no more than 15 lbf (66 N) of force.~~
- ~~2. The window opening limiting device release mechanism shall operate properly in all types of weather.~~
- ~~3. Window opening limiting devices shall have their release mechanisms clearly identified for proper use in an emergency.~~
- ~~4. The window opening limiting device shall not reduce the minimum net clear opening area of the window unit below what is required by Section R310.1.1 of the code.~~

**PART I - IRC**

**Committee Action:**

**Approved as Modified**

**Modify the proposal as follows:**

~~**R612.3 Window opening control devices.** When required elsewhere in this code, Window opening control devices shall comply with ASTM F 2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section R 310.1.1. The device or any portion thereof shall not project more than 1 inch into the required net clear opening for a length not exceeding 3 inches when the window is in the fully open position.~~

*(Portions of proposal not shown remain unchanged)*

**Committee Reason:** The committee feels this is a good change and the ICC CTC and industry has reached a consensus for a solution to the window opening control devices and achieves consistency with the IBC. The modification requires all window opening control devices to comply with the standard and eliminate the proposed language about hardware projection.

**Assembly Action:**

**None**