



Date: December 1, 2023
To: City of Houston HPW-HPC
Attention: CCM
From: Jensen Hughes
Subject: IBC Social Stair Handrail requirements

This technical memo is provided to describe the new changes to the Houston Construction Codes with regards to the amendment related to the requirements of Social Stair Handrail requirements. Social stairs are an architectural element that serve a dual purpose of a gathering place and as a horizontal assembly between floors. They are often characterized by having a wide-open staircase in a central building location with integrated seating or display areas that are design for people to gather on.

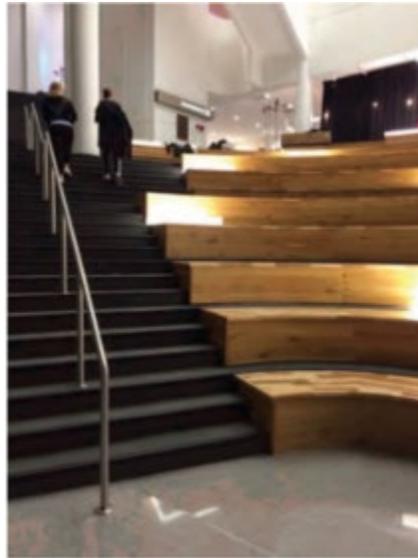


Photo Credit: International Code Council

In summary, this change adds guidance on how to address so called “social stairs” which are regulated by mix of the current general stairway provisions and assembly seating. The code section has also changed from Section **1029.15** in the 2015 edition to the 2021 edition **Section 1030.16**

Social stairs are becoming more popular in new construction, especially in educational and assembly occupancies. However, so far they have not been clearly classified or regulated by the code. Because of the myriad designs and the lack of any clear means of regulation or definition, the current regulation has been inconsistent. Depending on the design and jurisdiction, the provisions for bleachers, stairways, stepped aisles, or some other alternate system have been used to

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address them. In some cases, the effort to make them comply with the IBC's current code have possibly made them less safe by locating handrails where the users must either climb over or under the rail to reach the seating platforms.

The new regulations are a variation of the assembly stepped aisle provisions of **Section 1030**. The reasoning is based on having an assembly seating area with the seating platforms, without seats, located beside the stepped aisle. This approach will help define the aisle width requirements (per **Section 1030.9.1**) as well as deal with the placement of handrails serving the adjacent stepped aisle or, if also included a stairway adjacent to the stepped aisle.

Section 1030.16 requires handrails either at one or both sides of the aisle or allows a handrail to be in the middle of the aisle. In situations where there is seating to one side, **Section 1030.16** now requires two handrails where the aisle width exceeds 74-inches. The 74-inch width was selected to create a width that will keep the steps functional. For this requirement, that dimension was selected by the 30-inch measurement from the seating plus the typical 44-inch stairway width required by **Section 1011.2**. Using these two dimensions to create the 74-inch requirement and the need for having two handrails makes certain that the handrails will be provided where necessary and not be required on narrower stepped aisles where the second handrail could hinder movement or egress in the aisle.

Where two handrails are required, **Section 1030.16.1** requires any handrail located other than at the side of the aisle to be a discontinuous handrail. The discontinuous handrail provisions are consistent with what was previously required for center aisle handrails in assembly seating. Using these discontinuous handrails allows for a stepped aisle adjacent to the seating platforms but also allow people to freely move from that aisle to any adjacent stepped aisle without having to climb over or under the rail or needing to go to the top or bottom to get to the other side. This will allow people to use an actual stepped aisle to access the platforms of the social stairway as intended by the designers as opposed to requiring them to walk on the platforms that may have larger riser heights and varying depths.

Several good examples of both acceptable and unacceptable designs can be found in a review of code change **submittal E106-18**.

These code changes are intended to accommodate a modern design choice in many public buildings and allow it to have easy access for its proper use, while maintaining the egress functions of the stair itself.

2021 Houston Building Code Changes –

SECTION ~~1029.15~~ 1030.16 HANDRAILS.

~~1029.15~~ 1030.16 Handrails. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and stepped aisles shall be provided with handrails in compliance with **Section 1014** located either at one or both sides of the aisle or within the aisle width. *Where stepped aisles have seating on one side and the aisle width is 74 inches (1880 mm) or greater, two handrails are required. Where two handrails are required, one of the handrails shall be within 30 inches (762 mm) horizontally of the stepped aisle.*

Exceptions:

1. Handrails are not required for ramped aisles with seating on both sides.
2. Handrails are not required where, at the side of the aisle, there is a guard with a top surface that complies with the grasp ability requirements of handrails in accordance with **Section 1014.3**.
3. Handrail extensions are not required at the top and bottom of stepped aisles and ramped aisles to permit crossovers within the aisles.



~~4029.15.4~~ **1030.16.1 Discontinuous Mid-Aisle Handrails.** Where there is seating on both sides of the aisle, the mid-aisle handrails shall be discontinuous. ~~with~~ **Where a stepped aisle is required to have two handrails, the mid-aisle handrails shall be discontinuous.** Gaps or breaks **shall be provided** at intervals not exceeding five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other. These gaps or breaks shall have a clear width of not less than 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the mid-aisle handrail shall have rounded terminations or bends.

~~4029.15.2~~ **1030.16.2 Handrail Termination.** Handrails located on the side of stepped aisles shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stepped aisle flight.

~~4029.15.3~~ **1030.16.3 Mid-Aisle Termination.** Mid-aisle handrails shall not extend beyond the lowest riser and shall terminate within 18 inches (381 mm), measured horizontally, from the lowest riser. Handrail extensions are not required.

Exception: Mid-aisle handrails shall be permitted to extend beyond the lowest riser where the handrail extensions do not obstruct the width of the cross aisle.

~~4029.15.4~~ **1030.16.4 Rails.** Where mid-aisle handrails are provided in stepped aisles, there shall be an additional rail located approximately 12 inches (305 mm) below the handrail. The rail shall be adequate in strength and attachment in accordance with Section 1607.9.1.2.

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IBC-EGRESS 2018 GROUP A PUBLIC COMMENT AGENDA-

**SECTION E106-18
Proposed Change as Submitted**

E106-18

IBC: 1029.16, 1029.16.1, (IFC[BE] 1029.16, 1029.16.1)

Proposed Change as Submitted

Proponent: Ed Kulik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 International Building Code

Revise as follows

1029.16 Handrails. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and stepped aisles shall be provided with handrails in compliance with Section 1014 located either at one or both sides of the aisle or within the aisle width. Where the stepped aisle have seating on one side and the aisle width is 74 inches (1880 mm) or greater, two handrails are required. Where two handrails are required, one of the handrails shall be within 30 inches horizontally of the end of the aisle accessways.

Exceptions:

1. Handrails are not required for ramped aisles with seating on both sides.
2. Handrails are not required where, at the side of the aisle, there is a guard with a top surface that complies with the graspability requirements of handrails in accordance with Section 1014.3.
3. Handrail extensions are not required at the top and bottom of stepped aisles and ramped aisles to permit crossovers within the aisles.

1029.16.1 Discontinuous handrails. Where there is seating on both sides of the aisle, the mid-aisle handrails shall be ~~discontinuous with~~ discontinuous. Where the stepped aisle is required to have two handrails, handrails not located on a guard or wall shall be discontinuous. The gaps or breaks at intervals shall not exceeding exceed five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other. These gaps or breaks shall have a clear width of not less than 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the mid-aisle handrail shall have rounded terminations or bends.

1029.16.2 Handrail termination. Handrails located on the side of stepped aisles shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stepped aisle flight.

1029.16.3 Mid-aisle termination. Mid-aisle handrails shall not extend beyond the lowest riser and shall terminate within 18 inches (381 mm), measured horizontally, from the lowest riser. Handrail extensions are not required.

Exception: Mid-aisle handrails shall be permitted to extend beyond the lowest riser where the handrail extensions do not obstruct the width of the cross aisle.

Reason: The social stairway is a new style being used in common areas of schools and multi-assembly buildings. It appears to fall somewhere between stairways and assembly seating. If this is considered a stairway next to platforms, the general requirement for handrails on both sides of the stairway prevents access to the platforms (Example 4). Considering this configuration as assembly seating would require one handrail with current text. This proposal considers this arrangement as a type of assembly seating. The width would have to be determined using both the general circulation number from the upper/lower floor and the seating in accordance with Section 1029.6.1, which requires extra width if a handrail is not with 30". By considering this assembly seating, accessible wheelchairs spaces would already be addressed. Drop offs along the top would have to meet guard provisions.

To address occupant safety, this proposal will require a mid-aisle handrail on wide stepped aisles in addition to the handrail on the wall. The reasoning for 74" was that we did not want either side of the handrails to create a width that was not readily useable (30" + 44" = 74"). The second handrail being within 30" of the edge of the platform allows flexibility in handrail placement, but still keeps the handrail within reach of persons moving off the platforms. Where there is not a cross aisle, the handrail would still have to have handrail extensions at the top and bottom, as well as meet all the other handrail provisions in Section 1014 and 1029.6. This 2nd handrails would typically not show up in stadium seating where aisles are typically less wide than specified here.

As you can see in the examples provided: Example 1 has two handrails, but with one on the far side of the platform. Example 4 a 2nd handrail blocks access to the platforms, so people either climb up the platforms, or go under the handrail. In example 2 and 3 a handrail is only provided on one side of the stairway, regardless of width. None of these configuration would address stairway safety and access to the platforms. Example 3 has an example handrail drawn in red of what these requirements would add.

This proposal is submitted by the ICC Building Code Action Committee (BCAC). BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open meetings. In addition, there were numerous Working Group meetings and conference calls for the current code development cycle, which included members of the committee as well as any interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac>.



Figure 1



Figure 2



Figure 3



Figure 4

Cost Impact: The code change proposal will increase the cost of construction. In some situations, this could require a 2nd handrail for occupant safe egress on the stairways.

E106-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This is used in a variety of school environments so addressing this issue is needed. The handrail adjacent to this stairway seating arrangement should be the same as required for stepped aisles. Where the 2nd handrail is located needs to be clarified. There was a question on what was meant by the "handrail not located on a guard". Perhaps a definition of "stepped aisle" is needed. There were a couple of grammar errors that need to be fixed. (Vote 9-5)

Assembly Action:

None

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Individual Consideration Agenda

Public Comment 1:

Proponent: Gene Boecker, representing Code Consultants, Inc. (geneb@codeconsultants.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

1029.16 Handrails. Ramped *aisles* having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and stepped *aisles* shall be provided with *handrails* in compliance with Section 1014 located either at one or both sides of the *aisle* or within the *aisle* width. Where the stepped aisle have seating on one side and the aisle width is 74 inches (1880 mm) or greater, two handrails are required. Where two handrails are required, one of the handrails shall be within 30 inches horizontally of the ~~end of the stepped aisle accessways.~~

Exceptions:

1. *Handrails* are not required for ramped *aisles* with seating on both sides.
2. *Handrails* are not required where, at the side of the aisle, there is a *guard* with a top surface that complies with the graspability requirements of *handrails* in accordance with Section 1014.3.
3. *Handrail* extensions are not required at the top and bottom of stepped *aisles* and ramped *aisles* to permit crossovers within the *aisles*.

Commenter's Reason: The committee expressed a concern that guard and stepped aisle may not be understood. That is unlikely. A guard at the side of a stair is certainly something that has been provided as a part of the code for a long time. The only real concern was the language about how the location of the second handrail should be measured. That has been modified to address that concern.

This is a coe change that needs to be addressed. The current provisions of the code do not address what to do fro these types of stairways that are located all over the country; with more popping up everyday.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction As noted in the original proposal the cost will be increased where a second handrail is required.

Public Comment 2:

Proponent: Ed Kulik, representing ICC Building Code Action Committee (bcac@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

1029.16 Handrails. Ramped *aisles* having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and stepped *aisles* shall be provided with *handrails* in compliance with Section 1014 located either at one or both sides of the *aisle* or within the *aisle* width. Where the stepped aisle ~~have~~ *has* seating on one side and the aisle width is 74 inches (1880 mm) or greater, two handrails are required. Where two handrails are required, one of the handrails shall be within

30 inches horizontally of the ~~end side of the tiered floor adjacent to the stepped aisle accessways.~~

Exceptions:

1. *Handrails* are not required for ramped *aisles* with seating on both sides.
2. *Handrails* are not required where, at the side of the aisle, there is a *guard* with a top surface that complies with the graspability requirements of *handrails* in accordance with Section 1014.3.
3. *Handrail* extensions are not required at the top and bottom of stepped *aisles* and ramped *aisles* to permit crossovers within the *aisles*.

1029.16.1 Discontinuous handrails. Where there is seating on both sides of the aisle, the mid-aisle *handrails* shall be discontinuous. Where the stepped aisle is required to have two handrails, ~~handrails not located on a guard or wall the mid-aisle handrails~~ shall be discontinuous. The gaps or breaks at intervals shall not ~~exceed five~~ ~~exceed five~~ rows to facilitate access to seating and to permit crossing from one side of the *aisle* to the other. These gaps or breaks shall have a clear width of not less than 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the mid-aisle *handrail* shall have rounded terminations or bends.

1029.16.2 Handrail termination. *Handrails* located on the side of stepped *aisles* shall return to a wall, *guard* or the walking surface or shall be continuous to the *handrail* of an adjacent stepped *aisle* flight.

1029.16.3 Mid-aisle termination. Mid-aisle *handrails* shall not extend beyond the lowest riser and shall terminate within 18 inches (381 mm), measured horizontally, from the lowest riser. *Handrail* extensions are not required.

Exception: Mid-aisle *handrails* shall be permitted to extend beyond the lowest riser where the *handrail* extensions do not obstruct the width of the cross *aisle*.

Commenter's Reason: This new style of assembly seating is very common in schools and libraries. It is an important safety issue that needs to be addressed. It is hoped that these tweaks with clarify the requirements so this can be added to the code.

To address the committee's concerns:

The new text in Section 1029.16 and 1029.16.1 will allow for the mid aisle handrail to be the same as for stepped aisles. The term tiered floors will be understood because it is already used in Section 1029.5. The 74 was chosen as the point where a 2nd handrail in the width of the stepped aisle would still allow for movement up and down on each side of the handrail.

The end of the aisle accessways was chosen because the tiered platforms do not always contain seats to measure from. Since the seating areas at stepped aisles are tiered platforms (with or without seats), this may be clearer.

Handrails are permitted on the wall or as the top rail of a guard in Section 1029.16. Since the discontinuous handrail could be either at the edge of the seating platforms or in the stepped aisle, mid-aisle handrail is current language that is easier to understand.

Stepped aisles is not defined for assembly seating, but is clearly understood in the context of Section 1029. Aisle is a defined term.

The grammatical error mentioned by the committee of exceeding to exceed in Section 1029.16.1 was addressed as an editorial correction to the original proposal by ICC staff.

What we want to see:



This is why we do not want continuous handrails where you want someone to access seating. This is a safety issue for when someone tries to climb up or down the tiers or goes over or under the handrail to access the seating areas. Discontinuous handrails already have requirements for maximum number of rows and maximum breaks that have worked with typical assembly seating for many decades.

This is what we do not want to see when you want access to seating.



Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. In some situations, this could require a 2nd handrail for occupant safe egress on the stairways.

E106-18