

Topsham Code Enforcement Office

This Tip Sheet reflects code requirements of the 2015 International Building Code (IBC). Where Ramps are required to be Accessible subject to chapter 11, also see ICC A117.1-2009

SECTION 1012 RAMPS

1012.1 Scope.

The provisions of this section shall apply to ramps used as a component of a *means of egress*.

Exceptions:

1. Ramped *aisles* within assembly rooms or spaces shall comply with the provisions in [Section 1029](#).
2. Curb ramps shall comply with [ICC A117.1](#).
3. Vehicle ramps in parking garages for pedestrian *exit access* shall not be required to comply with [Sections 1012.3](#) through [1012.10](#) where they are not an *accessible route* serving *accessible* parking spaces, other required *accessible* elements or part of an accessible *means of egress*.

❖ Ramps provide an alternative method of vertical means of access to or egress from a building. Ramps are required for access to building areas for persons who are mobility impaired (see [Chapter 11](#)) and for small changes in floor elevations that are a safety hazard in themselves (see [Section 1003.5](#)). All ramps intended for pedestrian usage, whether required or otherwise provided, must comply with the requirements of this section. The code considers any walking surface that has a slope steeper than one unit vertical in 20 units horizontal (5-percent slope) to be a ramp (see the definition for “[Ramp](#)” in [Chapter 2](#)).

As with stairways, it is important to understand the terminology. Exit ramps are ramps that provide a protected path of travel between the exit access and the exit discharge. Interior exit ramps are required to be enclosed in accordance with [Section 1022](#). Exterior exit ramps are protected by the exterior wall of the building and must comply with [Section 1027](#). Exit access ramps are typically unenclosed interior ramps and comply with [Section 1019](#) when they provide access between stories. Exit access travel distance stops at an exit ramp enclosure, but includes any travel down an exit access ramp. Ramps that are outside and provide a route from the level of exit discharge to grade are considered part of the exit discharge. See the commentary in [Chapter 2](#) for the defined term, “[Exit discharge, level of.](#)”

Exception 1 indicates that ramped aisles are addressed in [Section 1029](#). Having this exception at the beginning of the ramp section negated the need for repeated exceptions throughout the ramp provisions. While ramps and ramped aisles may look similar, configurations and how occupants move on and off those walking surfaces are very different. Occupants leave and join ramped aisles along the entire run, while occupants only enter the ramp at the top and bottom. Ramped aisles may have no or only one handrail in order to allow for access to the seats, while most ramps have handrails on both sides. Ramped aisles can have steeper slopes to allow for seating bowls to address line of sight. [Section 1029](#) should be used for ramped aisles between and immediately adjacent to seating or where the ramps are a direct continuation of the ramped aisles and lead to a level cross aisle or floor. [Section 1012](#) is used for ramps that lead from the balcony, concourse or cross aisle to a floor level above or below the seating areas.

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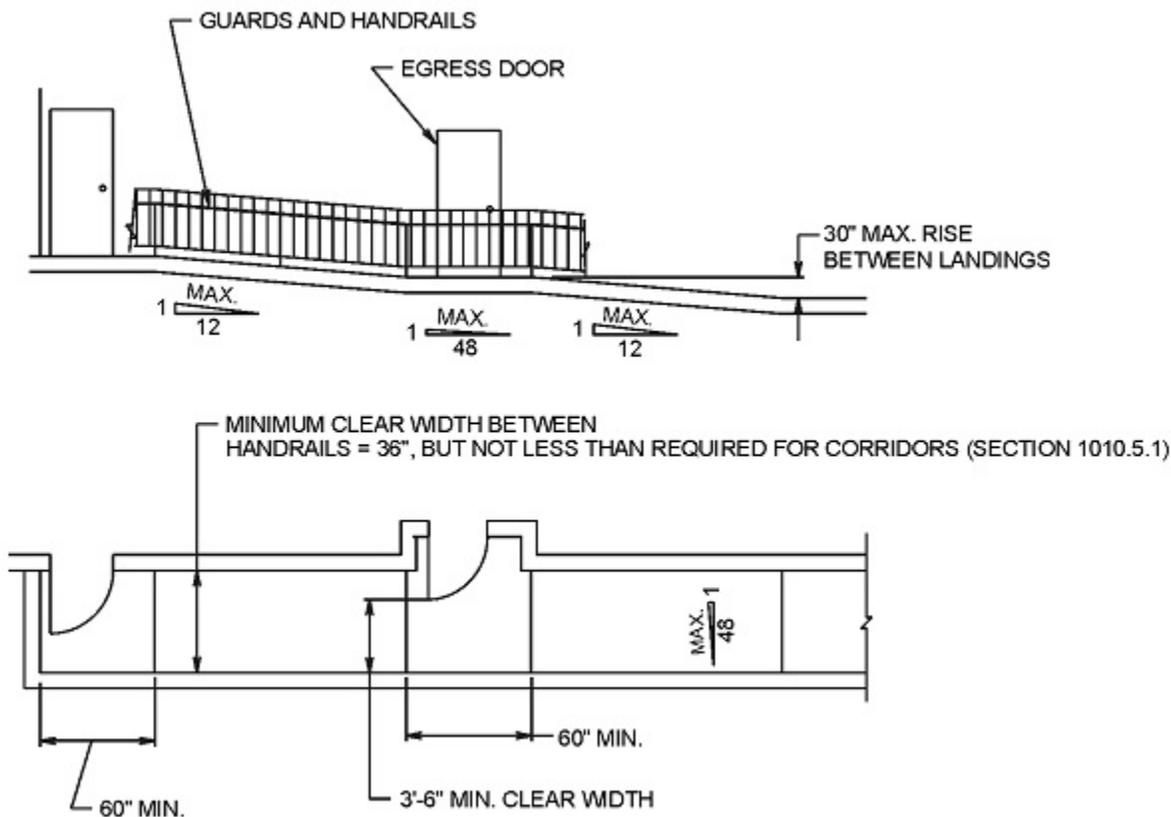
Exception 2 references specific curb cut requirements found in [Section 406](#) of ICC A117.1. It is important to realize there are different provisions for curb ramps and ramps. For example, a curb ramp can have a rise of any height and not require handrails. Ramps require handrails when the rise is more than 6 inches.

Exception 3 addresses parking garages. An accessible route is required to and from any accessible parking space, and all ramp provisions must be followed. However, ramps that provide access to and from non accessible spaces in the remainder of the parking garage need only comply with the provisions for slope and guard requirements. This permits non accessible portions of garages to be constructed as a continuous slope. Ramps that are strictly for vehicles, such as jump ramps, are not required to meet any of the ramp provisions.

1012.2 Slope.

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

❖ Maximum slope is limited to facilitate the ease of ascent and to control the descent of persons with or without a mobility impairment. The maximum slope of a ramp in the direction of travel is limited to one unit vertical in 12 units horizontal (1:12) (see Commentary [Figure 1012.2](#)). Ramps in existing buildings may be permitted to have a steeper slope at small changes in elevation (see [Sections 410.8.5](#) and [705.1.4](#) of the IEBC). An example of a ramp that is not part of a means of egress and, therefore, allowed to be a maximum slope of 1:8, is a loading dock or delivery ramp where the ramp is not part of any required exit discharge.



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

Figure 1012.2
TYPICAL MEANS OF EGRESS RAMP

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1012.3 Cross slope.

The slope measured perpendicular to the direction of travel of a *ramp* shall not be steeper than one unit vertical in 48 units horizontal (2-percent slope).

❖ The limitation of one unit vertical in 48 units horizontal on the slope across the direction of travel is to prevent a severe cross slope that would pitch a user to one side (see Commentary [Figure 1012.2](#)).

1012.4 Vertical rise.

The rise for any *ramp* run shall be 30 inches (762 mm) maximum.

Because pushing a wheelchair up a ramp requires a great deal of energy, landings must be situated so that a person can rest after each 30-inch (762 mm) elevation change (see Commentary [Figure 1012.2](#)).

1012.5 Minimum dimensions.

The minimum dimensions of *means of egress ramps* shall comply with [Sections 1012.5.1](#) through [1012.5.3](#).

❖ These minimum dimension requirements allow the ramp to function as a means of egress and an accessible route.

1012.5.1 Width and capacity.

The minimum width and required capacity of a *means of egress ramp* shall be not less than that required for *corridors* by [Section 1020.2](#). The clear width of a *ramp* between *handrails*, if provided, or other permissible projections shall be 36 inches (914 mm) minimum.

❖ The requirements for the width of a means of egress ramp is based on the width required for minimum width [typically 36 inches (914 mm)] and the capacity based on the occupant load to be served (see [Section 1005.3.2](#)). Note that the clear width of 36 inches (914 mm) is required between the handrails and any other obstructions (e.g., handrail supports, curbs) for proper clearance for a person in a wheelchair. This is different from stairways where handrails are permitted to project into the required width. The 36-inch (914 mm) minimum clear width between handrails is consistent with [ICC A117.1](#) and the federal 2010 ADA Standard.

1012.5.2 Headroom.

The minimum headroom in all parts of the *means of egress ramp* shall be not less than 80 inches (2032 mm).

❖ The requirement for headroom on any part of an egress ramp is identical to the requirement of a conventional (nonspiral) stairway (see [Section 1011.3](#)). General headroom heights along the means of egress are addressed in [Section 1003.2](#).

1012.5.3 Restrictions.

Means of egress ramps shall not reduce in width in the direction of egress travel. Projections into the required *ramp* and landing width are prohibited. Doors opening onto a landing shall not reduce the clear width to less than 42 inches (1067 mm).

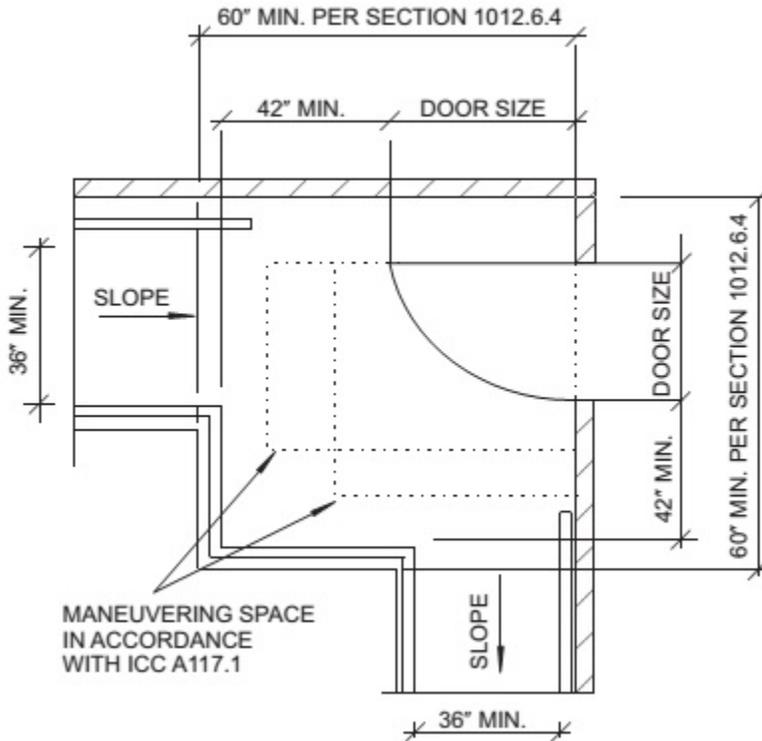
❖ The purpose of not allowing ramps to reduce in width in the direction of egress travel is to prevent a restriction that would interfere with the flow of occupants out of a facility. This would include ramp landings in accordance with [Section 1012.6.2](#). Handrails are the only exception in accordance with [Sections 1012.5.1](#) and [1014.8](#).

Doors that open onto a ramp landing, including those at the top and bottom landings, must not reduce the clear width to less than 42 inches (1067 mm). This is a more restrictive provision than for corridors that would permit the reduction to one-half the required width (see [Section 1005.7](#)). Since one of the purposes of a ramp is to accommodate persons with physical disabilities, it must provide the additional clear width for access by those

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confined to wheelchairs without the interference or potential blockage caused by the swing of a door (see Commentary [Figures 1012.2](#) and [1012.5.3](#)).



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Figure 1012.5.3
DOORWAY OPENING ONTO LANDING

1012.6 Landings.

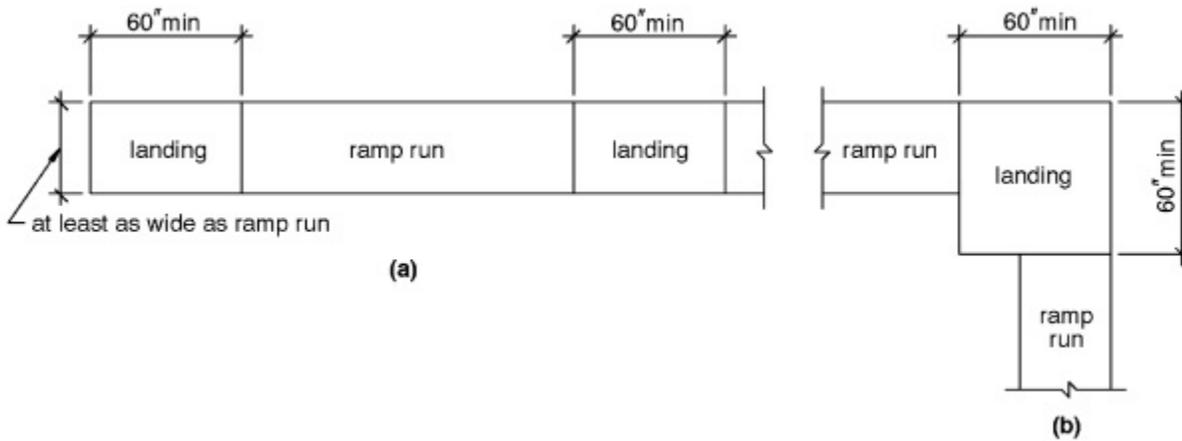
Ramps shall have landings at the bottom and top of each *ramp*, points of turning, entrance, exits and at doors. Landings shall comply with [Sections 1012.6.1](#) through [1012.6.5](#).

❖ Landings must be provided to allow users of a ramp to rest on a level floor surface and to adjust to the change in floor surface pitch.

Landings are required at the top and bottom of each ramp run (see Commentary [Figure 1012.6](#)). In addition, [Section 1012.4](#) requires a landing every 30 inches (762 mm) of vertical rise of the ramp. The requirements for landings allow those occupants of the structure the ability to negotiate all changes in direction, and prepare themselves to either ascend or descend the ramp and to rest. If there is a door at the top or the bottom of the ramp, there are additional requirements in [Section 1012.5.3](#) for door swing over the landing and [Section 405](#) of ICC A117.1 for maneuvering space and turning space at the door.

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Figure 1012.6
RAMP LANDINGS

1012.6.1 Slope.

Landings shall have a slope not steeper than one unit vertical in 48 units horizontal (2-percent slope) in any direction. Changes in level are not permitted.

❖ Landings must be almost flat. This allows persons confined to a wheelchair to come to a complete stop without having to activate the brake or hold themselves stationary at the landing. The maximum slope or cross slope of the landing in any direction is 1:48 (see Commentary [Figure 1012.2](#)). This minimum slope is to allow for drainage to limit the accumulation of water on the landing surface.

1012.6.2 Width.

The landing width shall be not less than the width of the widest *ramp* run adjoining the landing.

❖ The width of all landings must be consistently as wide as the widths of the ramp runs leading to them. Means of egress ramps cannot be reduced in width in the direction of egress travel. This is also applicable to the landings connecting the ramp runs (see Commentary [Figure 1012.6](#)).

1012.6.3 Length.

The landing length shall be 60 inches (1525 mm) minimum.

Exceptions:

1. In Group R-2 and R-3 individual *dwelling* and *sleeping units* that are not required to be *Accessible units, Type A units* or *Type B units* in accordance with [Section 1107](#), landings are permitted to be 36 inches (914 mm) minimum.
 2. Where the *ramp* is not a part of an *accessible route*, the length of the landing shall not be required to be more than 48 inches (1220 mm) in the direction of travel.
- ❖ The landings for ramps must be at least 60 inches (1524 mm) long (see Commentary [Figure 1012.6](#)). This allows persons confined to wheelchairs a sufficient distance to stop and rest along with any persons who may be assisting them. This requirement is directly applicable to straight-run ramps that may require an intermediate landing at every 30 inches (762 mm) of vertical rise (see Commentary [Figure 1012.2](#)). If the landing is also to be

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used to negotiate a change in the ramp's direction, [Section 1012.6.4](#) is applicable. If a door overlaps the landing, [Section 1012.5.3](#) is applicable.

The exceptions provide for smaller landings in dwelling and sleeping units and other locations where the ramp is not part of an accessible route. Exception 1 is consistent with the [IRC](#). Exception 2 would be applicable in areas such as service ramps and ramps serving assembly seating areas that do not contain any wheelchair spaces.

1012.6.4 Change in direction.

Where changes in direction of travel occur at landings provided between *ramp* runs, the landing shall be 60 inches by 60 inches (1524 mm by 1524 mm) minimum.

Exception: In Group R-2 and R-3 individual *dwelling or sleeping units* that are not required to be *Accessible units, Type A units or Type B units* in accordance with [Section 1107](#), landings are permitted to be 36 inches by 36 inches (914 mm by 914 mm) minimum.

❖ When a change in direction is made in the ramp at a landing, the landing must be a square of at least 60 inches (1524 mm). This allows the person confined to a wheelchair enough room to negotiate the turn with minimal effort. The length of the landing may need to exceed 60 inches (1524 mm) to match the widths of the two ramp runs. In any case, the landing would still need to be 60 inches (1524 mm) wide (see Commentary [Figures 1012.5.3](#) and [1012.6](#)). If a door overlaps the landing, [Section 1012.5.3](#) is applicable. It is not the intent of this provision to prohibit curved ramps. As long as the cross slope meets the limitations in Section 1010.4, the curved ramp is permitted.

The exception provides for smaller landings in dwelling and sleeping units where the ramp is not part of an accessible route. This is consistent with requirements in the [IRC](#).

1012.6.5 Doorways.

Where doorways are located adjacent to a *ramp* landing, maneuvering clearances required by [ICC A117.1](#) are permitted to overlap the required landing area.

❖ This section specifies that the area required for maneuvering to open the door and the area of the landing are allowed to overlap. It is not necessary to provide the sum of the two area requirements (see Commentary [Figure 1012.5.3](#)). Requirements for maneuvering space and turning space at the top and bottom of ramps are found in [Section 405](#) of ICC A117.1. [ICC A117.1](#) requires a turning space at the top or bottom landing of a ramp where the door may be locked. This allows people to turn around to travel back along the ramp.

1012.7 Ramp construction.

Ramps shall be built of materials consistent with the types permitted for the type of construction of the building, except that wood *handrails* shall be permitted for all types of construction.

❖ Material requirements for the type of construction as required by [Section 602](#) for floors are also the material requirements for ramp construction.

1012.7.1 Ramp surface.

The surface of *ramps* shall be of slip-resistant materials that are securely attached.

❖ As the pace of exit travel becomes hurried during emergency situations, the probability of slipping on smooth or slick floor surfaces increases. To minimize the hazard, all floor surfaces in the means of egress are required to be slip resistant. The use of hard floor materials with highly polished, glazed, glossy or finely finished surfaces should be avoided. This is consistent with [Section 1003.4](#).

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Field testing and uniform enforcement of the concept of slip resistance is not practical. One method used to establish slip resistance is that the static coefficient of friction between leather [Type 1 (Vegetable Tanned) of Federal Specification KK-L-165C] and the floor surface is greater than 0.5. Laboratory test procedures such as ASTM D2047 can determine the static coefficient of resistance. Bulletin No. 4 entitled “Surfaces” issued by the U.S. Access Board (ATBCB) contains further information regarding slip resistance.

1012.7.2 Outdoor conditions.

Outdoor *ramps* and outdoor approaches to *ramps* shall be designed so that water will not accumulate on walking surfaces.

❖ Outdoor ramps, landings and the approaches to the ramp must be sloped so that surfaces do not accumulate water so as to provide a safe path of egress travel at all times. While not specifically stated, any interior locations, such as near a pool, should also have the ramps designed to limit the accumulation of water in order to maintain slip resistance (see [Sections 1003.4](#) and [1012.7.1](#)).

Where exterior ramps are used in moderate or severe climates, there may also be a concern to protect the ramp from accumulations of snow and ice to provide a safe path of egress travel at all times, including inclement weather. Maintenance of the means of egress in the [IFC](#) requires an unobstructed path to allow for full instant use in case of a fire or emergency (see [Section 1031.3](#) of the IFC). Typical methods for protecting these egress elements include roof overhangs or canopies, heated slabs and, when approved by the building official, a reliable snow removal maintenance program.

1012.8 Handrails.

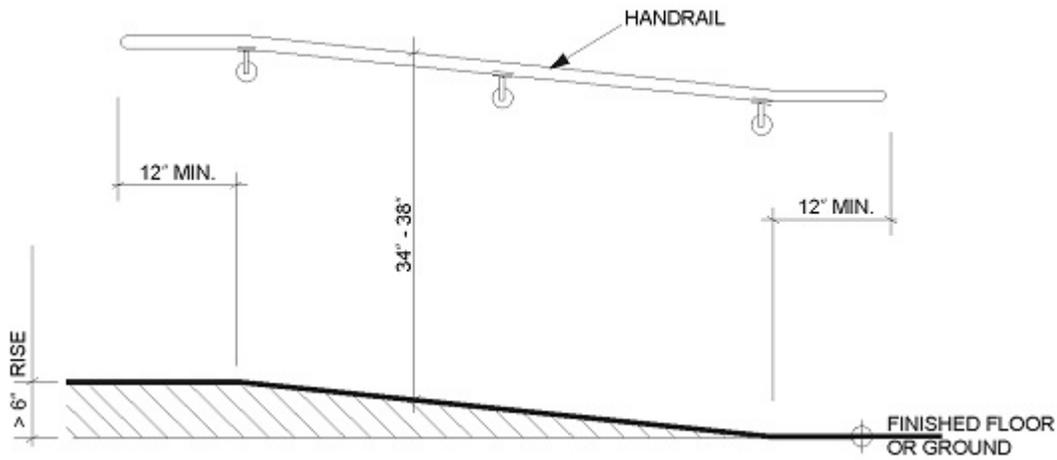
Ramps with a rise greater than 6 inches (152 mm) shall have *handrails* on both sides. *Handrails* shall comply with [Section 1014](#).

❖ To aid in the use of a ramp, handrails are to be provided. Handrails are intended to provide the user with a graspable surface for guidance and support. All ramps with a vertical rise greater than 6 inches (152 mm) between landings are to be provided with handrails on both sides [see Commentary [Figures 1012.8\(1\)](#) and [1014.2](#)]. General strength requirements for handrails are found in [Section 1014](#) with a reference to [Section 1607.8](#). Note that if the handrail extension is at a location that could be considered a protruding object, the handrail extension must return to the post at a height of less than 27 inches (686 mm) above the floor. Handrails along the ramp runs are not considered protruding objects.

Depending on the configuration of the ramp and the adjacent walking surface, ramps may require a combination of handrails, edge protection and guards. See Commentary [Figures 1012.8\(1\)](#), [1012.8\(2\)](#), [1012.8\(3\)](#) and [1012.8\(4\)](#) for illustrations of some alternatives.

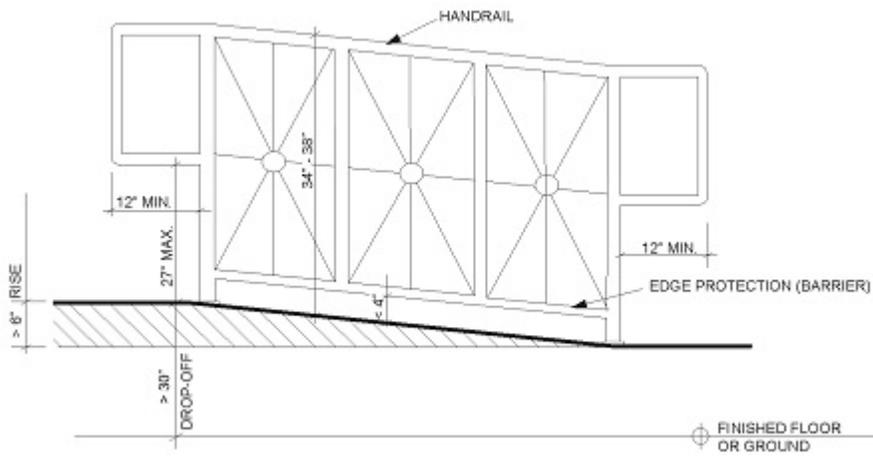
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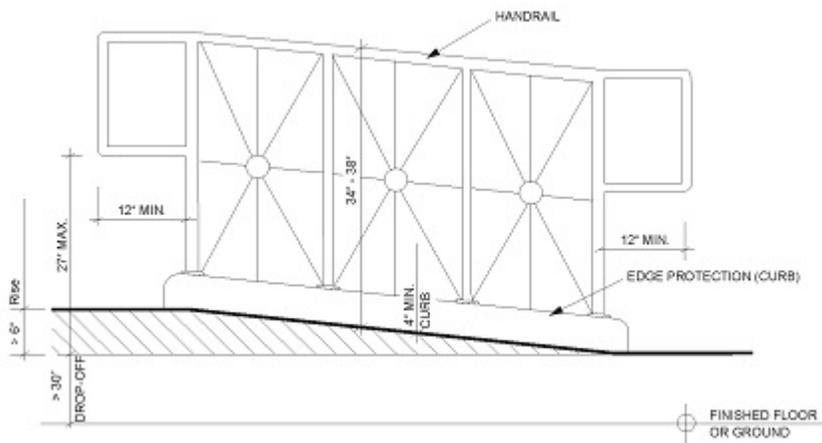
For SI: 1 inch = 25.4 mm.

Figure 1012.8(1)
RAMP WITH HANDRAIL AT WALL



For SI: 1 inch = 25.4 mm.

Figure 1012.8(2)
RAMP WITH HANDRAIL AND BARRIER

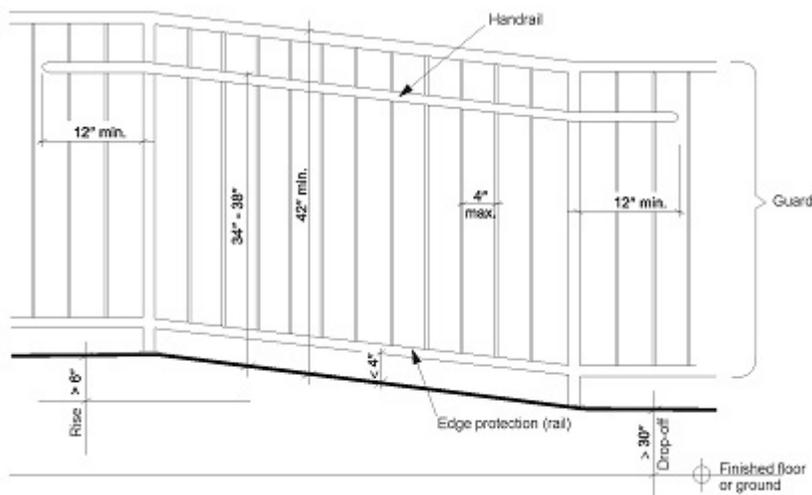


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Figure 1012.8(3)
RAMP WITH HANDRAIL AND CURB



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Figure 1012.8(4)
RAMP WITH HANDRAIL AND GUARD

1012.9 Guards.

Guards shall be provided where required by [Section 1015](#) and shall be constructed in accordance with [Section 1015](#).

❖ To protect the user from falls to surfaces below, guards are to be provided where the sides of a ramp or landing are more than 30 inches (762 mm) above the adjacent grade. Guards are to be constructed in accordance with [Section 1015](#), including the minimum height of 42 inches (1067 mm) [see Commentary [Figure 1012.8\(4\)](#)].

Depending on the configuration of the ramp and the adjacent walking surface, ramps may require a combination of handrails, edge protection and guards. See Commentary [Figures 1012.8\(1\)](#), [1012.8\(2\)](#), [1012.8\(3\)](#) and [1012.8\(4\)](#) for illustrations of some alternatives.

1012.10 Edge protection.

Edge protection complying with [Section 1012.10.1](#) or [1012.10.2](#) shall be provided on each side of *ramp* runs and at each side of *ramp* landings.

Exceptions:

1. Edge protection is not required on *ramps* that are not required to have *handrails*, provided they have flared sides that comply with the [ICCA117.1](#) curb ramp provisions.
2. Edge protection is not required on the sides of *ramp* landings serving an adjoining *ramp* run or *stairway*.
3. Edge protection is not required on the sides of *ramp* landings having a vertical drop off of not more than 1/2 inch (12.7 mm) within 10 inches (254 mm) horizontally of the required landing area.

❖ This section of the code now addresses the comprehensive requirements for edge protection for all ramps. It must be noted that edge protection is not the same as the requirements for guards. The presence of a guard does not necessarily provide adequate edge protection and the presence of adequate edge protection does not satisfy the requirements for a guard. Edge protection is necessary to prevent the wheels of a wheelchair from leaving the ramp surface or becoming lodged between the edge of the ramp and any adjacent construction. For example, a ramp may

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be located relatively adjacent to the exterior wall of a building. However, between the ramp edge and the exterior wall, there is a strip of earth for landscape purposes. Without adequate edge protection, persons confined to wheelchairs could possibly have their wheels run off the side of the ramp into the landscape, causing them to tip. These requirements are consistent with [Section 405](#) of ICC A117.1 and those in the federal 2010 ADA Standard.

Exception 1 allows a ramp to have minimal edge protection as long as its vertical rise is 6 inches (152 mm) or less. The exception is predicated on the ramp not needing any handrails, which is established by the provisions of [Section 1012.8](#). Such a ramp would only need flared sides or returned curbs. Edge protection without handrails or guards could be a tripping hazard for ambulatory persons. For specific details of these types of edge protection, the provisions of [Section 406](#) of ICC A117.1 for curb ramps must be followed.

Exception 2 reiterates that edge protection is not literally required entirely around a ramp landing. Obviously, edge protection is not required along that portion of the landing that directly adjoins a ramp run; it is only required along the edges of the landing with a drop off (other than steps of ramp runs).

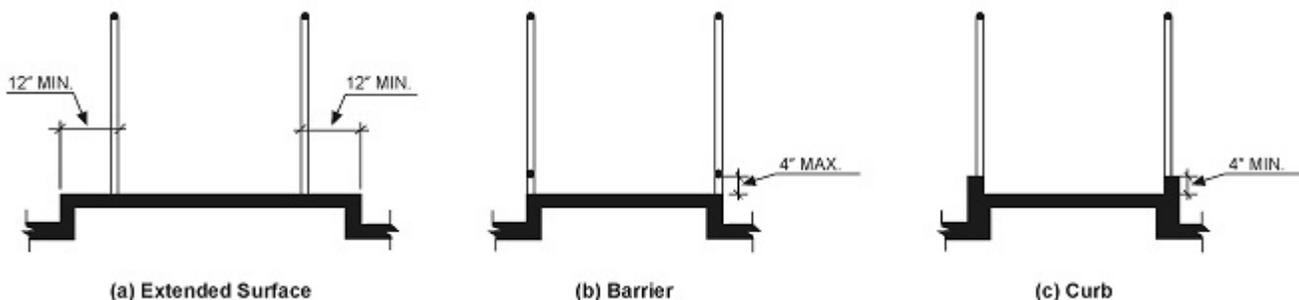
Exception 3 states that edge protection is not required for those sides of a ramp landing directly adjacent to the ground surface that gently slopes away from the edge of the landing. If the grade adjacent to the ramp landing slopes no more than 1/2:10 (which equates to 1:20) away from the landing, additional edge protection is not required. Such a gradual slope would not be detrimental to persons confined to wheelchairs as they negotiate the ramp landing. Note that this exception is limited to landings, not the ramp surface itself. The ramp must meet the edge protection in [Section 1012.10.1](#) or [1012.10.2](#).

Depending on the configuration of the ramp and the adjacent walking surface, ramps may require a combination of handrails, edge protection and guards. See Commentary [Figures 1012.8\(1\)](#), [1012.8\(2\)](#), [1012.8\(3\)](#) and [1012.8\(4\)](#) for illustrations of some alternatives.

1012.10.1 Curb, rail, wall or barrier.

A curb, rail, wall or barrier shall be provided to serve as edge protection. A curb shall be not less than 4 inches (102 mm) in height. Barriers shall be constructed so that the barrier prevents the passage of a 4-inch-diameter (102 mm) sphere, where any portion of the sphere is within 4 inches (102 mm) of the floor or ground surface.

❖ Edge protection for ramps and ramp landings may be achieved with a built-up curb or other barrier, such as a rail, wall or guard. The barrier must be located near the surface of the ramp and landing such that a 4-inch-diameter (102 mm) sphere cannot pass through any openings. An example of an effective barrier would be the bottom rail of a guard system. If the bottom rail is located less than 4 inches (102 mm) above the ramp and landing surface, edge protection has been provided. If a curb option is used, the curb must be a minimum of 4 inches (102 mm) high. The curb or barrier prevents the wheel of a wheelchair from running off the edge of the surface and provides people with visual disabilities a toe stop at the edge of the walking surface (see Commentary [Figure 1012.10.1](#)).



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Figure 1012.10.1
EDGE PROTECTION

1012.10.2 Extended floor or ground surface.

The floor or ground surface of the *ramp* run or landing shall extend 12 inches (305 mm) minimum beyond the inside face of a *handrail* complying with [Section 1014](#).

❖ An alternative to providing some type of barrier at the edge of the ramp (see [Section 1012.10.1](#)) is to make the ramp surface wider than the handrails provided at either side. The combination of the wider surface and the handrail barrier would assist in preventing a wheelchair or crutch tip from moving very far off the ramp during a temporary slip (see Commentary [Figure 1012.10.1](#)).

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