## COMMERCIAL STAIRS, RAILINGS, \& GUARDS

REFERENCE: 2021 International Building Code, Chapter 10.


## STAIR WIDTH

> Minimum width of 44 inches. (Exception: If occupant load is under 50 persons, stair width can be reduced to 36 ".)

## LANDINGS

> Landing width and depth must be at least equal to the width required for the stair.
$>$ Maximum vertical rise of a stair run must not exceed 12 feet without a landing or intermediate platform. However, if a landing occurs in a straight "run" of steps the depth of the landing need not be greater than 4 feet.

## HEADROOM

$>$ The minimum headroom in the stairway shall not be less than 6 feet, 8 inches measured vertically from the sloped plane of the tread nosing or from the floor surface of the landing or platform.

## COMMERCIAL TREAD DETAIL



## TREADS \& RISERS

> Maximum riser heights shall be 7" maximum and 4" minimum.
> Tread depths shall be 11" minimum.
> The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8".

## TREAD PROFILE

> The radius of curvature at the leading edge of the tread shall not be greater than $1 / 2^{\prime \prime}$.
$>$ Beveling of nosings shall not exceed $1 / 2^{\prime \prime}$.
$>$ Risers shall be solid and vertical or sloped from the underside of the leading edge of the tread not more than 30 degrees from vertical.
$>$ The greatest nosing projection shall not exceed the smallest by more than $3 / 8$ ".

## COMMERCIAL <br> GUARDS

## GUARDS REQUIRED

> Guards $42^{\prime \prime}$ in height are required at open-sided walking surfaces, mezzanines, industrial equipment platforms, stairs, ramps and landings which are located more than 30 inches above the floor or grade.
> Required guards shall have intermediate rails or ornamental closures that do not allow passage of a sphere 4 inches in diameter to a height of 36 ". From 36 " to 42 " above the adjacent walking surfaces, a sphere $4-3 / 8$ " in diameter shall not pass.
> The triangular openings formed by the riser, tread, and bottom rail of a guard at the open side of a stairway are permitted to be of such a size that a sphere 6 inches in diameter cannot pass through.


GRADE OR FLOOR

## Exception for guards in Groups I-3, F, H, or S

$>$ In areas not open to the public with occupancies in Group I-3, F, H, or S, balusters, horizontal intermediate rails or other construction shall not permit a sphere with a diameter of 21 " to pass through any opening.


## COMMERCIAL HANDRAILS

## HANDRAILS

> A handrail is required on both sides of stairway.
$>$ Handrail height shall be between 34 and 38 inches measured from the nosing of the tread. The handgrip portion of handrails shall have a circular cross section of $1 \frac{1}{4}$ " minimum to 2 " maximum. Other shapes that provide an equivalent grasping surface are permissible. Edges are to have a min. radius of $1 / 8$ ".
$>$ Handrails may encroach up to $41 / 2$ " at or below the handrail height into the required width on each side.

## HANDRAIL EXTENSIONS

> Extend 12" past the top riser and be parallel to the top landing.
$>$ Extend beyond the bottom riser and continue its slope for a distance equal to the depth of one tread.
$>$ Return to a wall, guard, or the walking surface or be continuous to the handrail of an adjacent stair flight.

## HANDRAIL GRASPABILITY

> Handrails must be installed at least $11 / 2^{\prime \prime}$ from adjacent walls.
$>$ The diameter of circular handrails must be at least $11 / 4$ " but not more than 2 ".
$>$ Non-circular handrails must have perimeter dimension of at least 4 " but not greater than $61 / 4$ " with a maximum cross-section dimension of $21 / 4$ ".


