THIS HANDOUT REPRESENTS ONLY THE VERY BASIC REQUIREMENTS OF COMMERCIAL STAIR AND LANDING REQUIREMENTS AND DOES NOT COVER FIRE-RESISTIVE ENCLOSURES, PATHS OF EGRESS TRAVEL OR EIXT REQUIREMENTS.

Construction materials of stairs and guardrails shall be structurally sound, noncombustible where required, and rot resistant and weather resistant. All spans of construction material shall comply with the IBC. Connection of material, handrails and guardrails shall support loads as required by the IBC. Exterior stairways shall not be placed within 10 feet of a property line or other buildings on the same lot unless the adjacent building exterior walls and openings are protected in accordance with IBC Section 705. IBC Section 1026.

FLOOR LEVEL AT DOORS – IBC SECTION 1008.1.
Regardless of the occupant load, there shall be a floor or landing on each side of the door. Such floor or landing shall be at the same elevation on each side of the door. Thresholds at doorways shall not exceed ½" (IBC Section 1008.1.7)

Door

½" max

Interior floor or landing to be level

12

¼

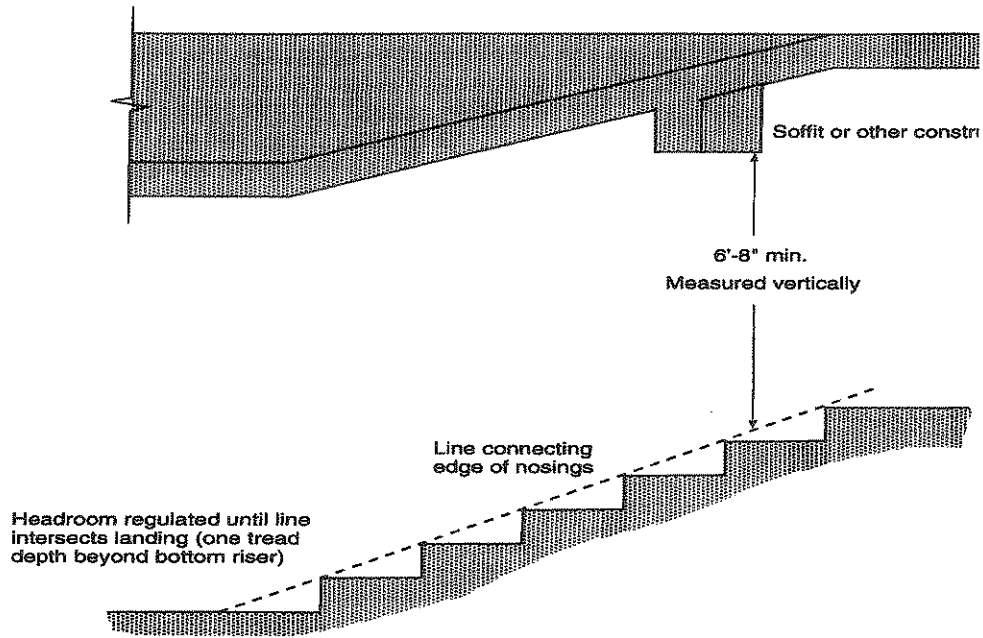Exterior landing maximum slope of 2%

For SI: 1 inch = 25.4 mm.
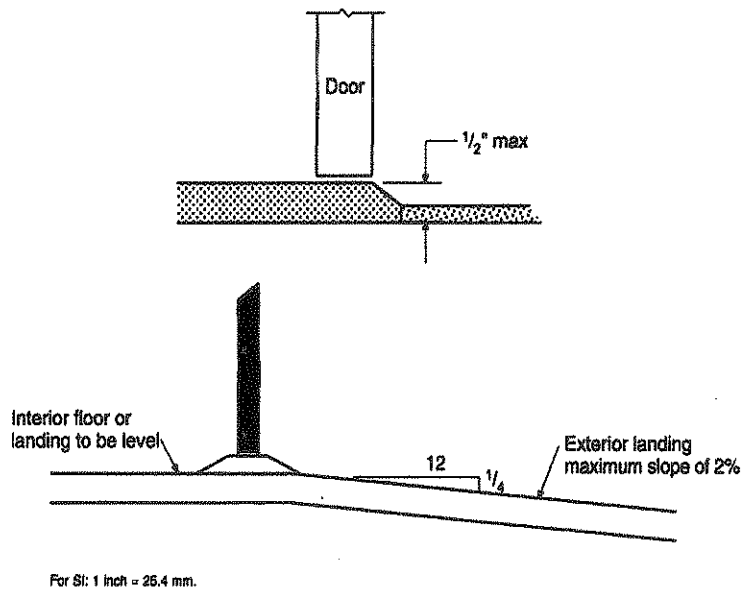
For interior situations, landings should be level. In exterior applications, landings may have a slope not to exceed $\frac{1}{4}$ unit vertical in 12 units horizontal (1:48). This maximum slope of 2% provides a relatively flat surface while maintaining adequate drainage.

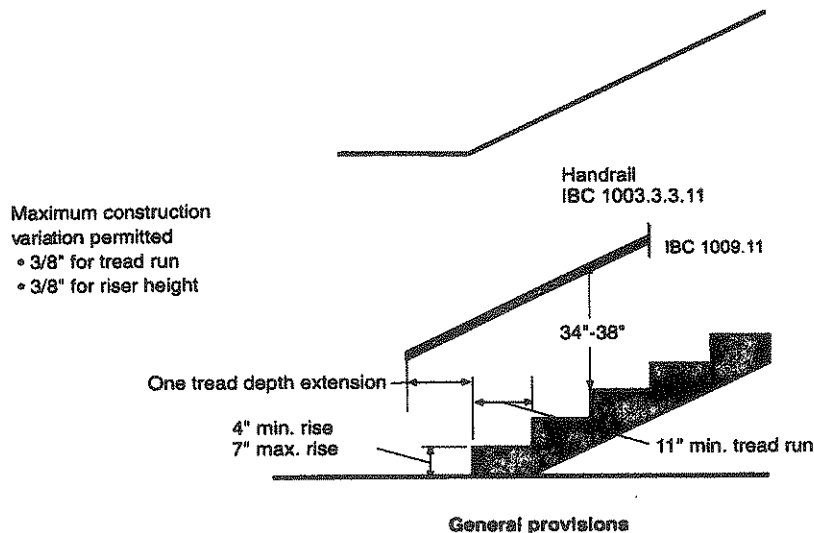## WIDTH AND HEIGHT OF STAIRWAYS – IBC SECTION 1009.4 & 1009.5

Stairways serving an **occupant load of 50 or less** shall not be less than **36" in width**. For occupant loads of 50 or more, the width of the stairway is to be determined as specified in IBC Section 1005.1, but such width cannot be less than 44". Projections into the required width at each handrail shall not exceed 4 ½' at or below handrail height.

Stairways shall have a minimum headroom clearance of 80" measured vertically from a line connecting the edge of the nosings. Such headroom shall be continuous above the stairway to the point where the line intersects the landing below, one tread depth beyond the bottom riser. The minimum clearance shall be maintained the full width of the stairway and landing.

Soffit or other constr

6'-8" min.
Measured vertically

Line connecting
edge of nosings

Headroom regulated until line
intersects landing (one tread
depth beyond bottom riser)

RISE AND RUN OF STAIRWAYS – IBC SECTION 1009.3

Stair **risers** height shall be **7" maximum and 4" minimum**. The stair **tread depth** shall be **11" minimum**. The largest tread run within any flight of stairs shall not exceed the smallest by more than 3/8". The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8".
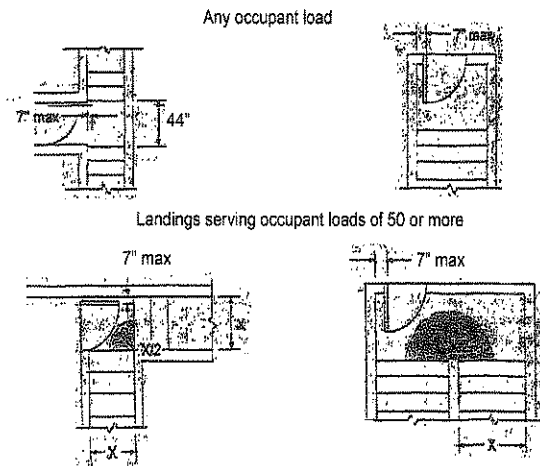
Handrail
IBC 1003.3.3.11

Maximum construction
variation permitted
• 3/8" for tread run
• 3/8" for riser height

IBC 1009.11

34"-38"

One tread depth extension

4" min. rise
7" max. rise

11" min. tread run

General provisions

LANDING AT STAIRWAYS – IBC Section 1009

There shall be a floor or landing at the top and bottom of each stairway. The width of the landing shall not be less than the width of the stairways they serve. Every landing shall have a minimum dimension measured in the direction of travel equal to the width of the stairway. Such dimension need not exceed a 48" where the stairway has a straight run. **A flight of stairs shall not have a vertical rise greater than 12 feet between floor levels or landings.**

There shall be a floor or landing at the top and bottom of each stairway or stair run

X minimum

X

Y min.

X min.

Y

X

But need not exceed 48"

X

X
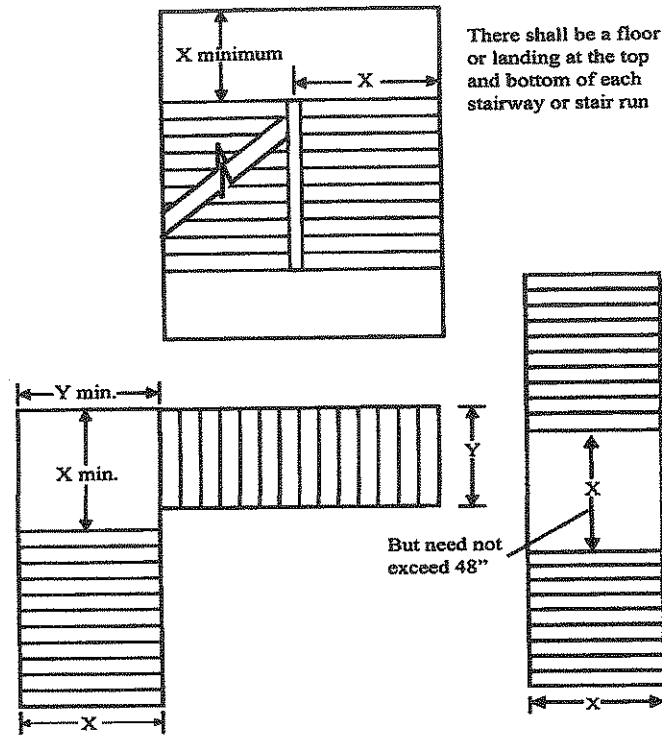
Door openings onto a landing shall not be reduced to less than one-half the required width. When fully open, the door shall not project more than 7" into a landing. Wheelchair spaces on landings for an area of refuge are to comply with 1007.6

Any occupant load

7" max

7" max

44"

Landings serving occupant loads of 50 or more
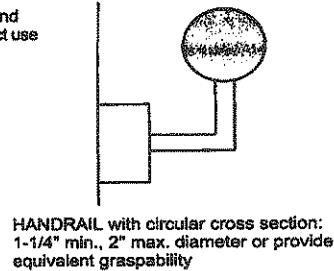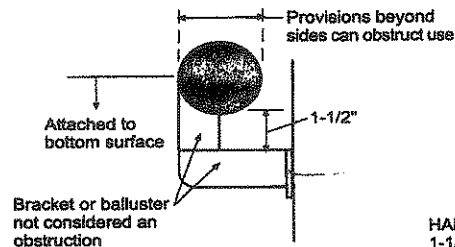
7" max

7" max
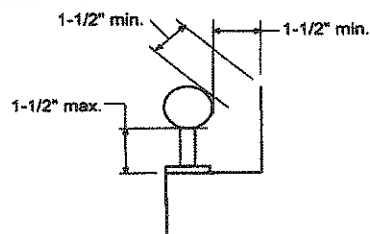
X

X

When x = the required width

HANDRAILS – IBC SECTION 1009.11

Stairways shall have handrails on each side. The top of the handrails and handrail extensions shall be placed not less than **34" or more than 38" above the nosing treads and landings**. Handrails with a circular cross section shall have an outside diameter of **at least 1.25" and not greater than 2"** or shall provide equivalent graspability. If handrail is not circular, it shall have a perimeter dimension of at least 4" and not greater than 6.25" with a maximum cross section dimension of 2.25". Handrail gripping surfaces shall be continuous, without interruption by newel posts or other obstructions. Handrails shall return to a wall, guard, or walking surface or shall be continuous to the handrail of an adjacent stair flight. **Handrails shall extend 12" beyond the top riser and one tread beyond the bottom riser.**
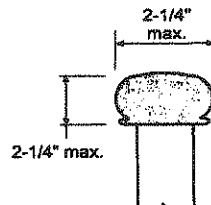
Section 1009.11.3

Provisions beyond sides can obstruct use

Attached to bottom surface

1-1/2"

Bracket or baluster not considered an obstruction

HANDRAIL with circular cross section: 1-1/4" min., 2" max. diameter or provide equivalent graspability

Section 1009.11.6

1-1/2" min.

1-1/2" min.

1-1/2" max.

A-300

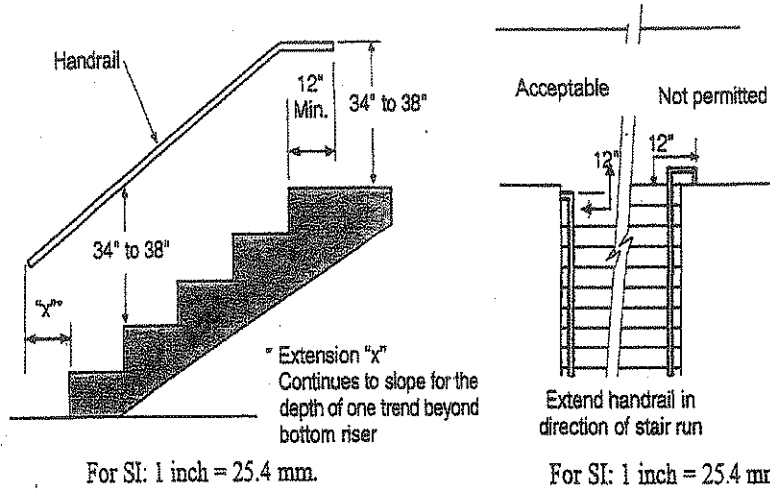For SI: 1 inch = 25.4 mm.

2-1/4" max.

2-1/4" max.

HANDRAIL that is not circular: perimeter of at least 4" but not greater than 6-1/4"

A major goal of handrail design and location is to make it easily graspable; hence, it is mandatory that the rail be placed at least $1\frac{1}{2}$ inches from any abutting elements, such as a wall. However, the projection of the rail into the required width is limited to no more than $4\frac{1}{2}$ inches.
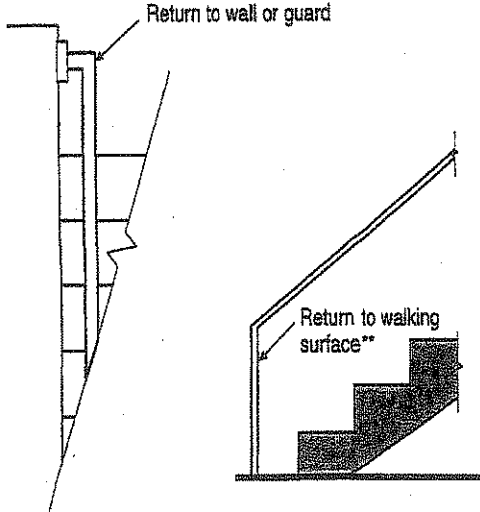
NOTE: HANDRAILS AND GUARDRAILS ARE NOT THE SAME. EACH RAIL SERVES A DIFFERENT PURPOSE AND MUST BE CONSTRUCTED PER APPLICABLE SECTIONS OF THE CODE, WHERE REQUIRED. A guardrail is required along the open-side of stairs, platforms, ramps, landings, or other walking surfaces that are located more than 30" to the floor or grade below at any point within 36" horizontally to the edge of the open side. The guardrail is 42" high, will have intermediate rails so that a 4" sphere cannot pass through, and is for the purpose of preventing someone from falling off the elevated structure. The handrail is 34"-38" high and provides continuous support or stability to someone traversing the stairs.

HANDRAIL EXTENSION – IBC Section 1012.6
Except where handrails are continuous between flights or serving a stairway within a dwelling unit,
handrails shall extend not less than 12 inches beyond the top riser and beyond the bottom riser.
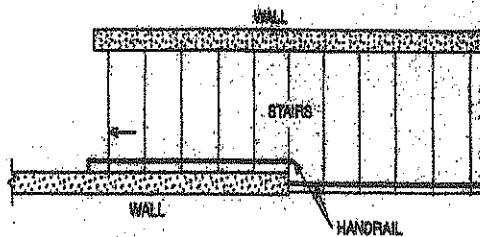
Handrail

12" Min.

34" to 38"

34" to 38"

"x"

" Extension "x"
Continues to slope for the
depth of one trend beyond
bottom riser

For SI: 1 inch = 25.4 mm.

Acceptable   Not permitted

12"   12"

Extend handrail in
direction of stair run

For SI: 1 inch = 25.4 mm.

Ends of handrails shall return to a wall, guard or the walking surface.

Return to wall or guard

** Within a dwelling unit, use
of a volute, turnout or
starting easing is allowed
on the lowest tread

Return to walking
surface**

NOT ACCEPTED ⇒

WALL

STAIRS

WALL

HANDRAIL

THE HANDRAIL DETAIL SHOWN HERE DOES NOT COMPLY
WITH THE "CONTINUOUS" TERMINOLOGY IN THE CODE.

For SI: 1 inch = 25.4 mm.

HANDRAIL CONTINUITY
FIGURE 1009-62

GUARDS – IBC SECTION 1013.4

Guards shall be located along open-sided walking surfaces, mezzanines, industrial equipment platforms, stairways, ramps and landings which are located more than 30" above the floor or grade. **Guards shall be a minimum height of 42".**

Open guards shall have balusters or ornamental patterns such that a 4" diameter sphere cannot pass through any opening up to a height of 34". From a height of 34" to 42" above the adjacent walking surface a sphere 4 3/8" in diameter shall not pass.