

**DECK CONSTRUCTION GUIDELINES**  
**CITY OF TONAWANDA**  
**716-695-1806**  
\*\*\*\*\*

**BUILDING PERMIT REQUIRED:** [BUILDING PERMIT APPLICATION](#)

A building permit is required for any new deck. A copy of a property survey is required to obtain a permit.

**DRAWINGS:**

A construction drawing, drawn to scale, showing all structural elements will be required for any deck permits. This forms outlines the requirements to obtain a permit to erect a deck.

**FOOTINGS:**

Must comply with The Residential Code of New York State, Section 403 and R403.1.4. The footing must be a minimum of twelve inches (12") in diameter and at a depth below the frost level of forty-two inches (42") from finish grade to the bottom of the footing. The footing may also be twelve inches (12") thick of concrete placed in the bottom of the forty-two inch (42") hole. The post would extend from the top of the concrete to the bottom of the girder. The backfill material must be well compacted around the post. The diameter of the footing increases with the increase in the size of the post. The footing shall be eight inches (8") larger than the largest dimension of the post. Footings in flood plain areas shall be twice the diameter. Second floor deck footings and decks with roof structures must be a minimum of twenty-four inches (24") in diameter or be designed by an architect or engineer.

Example      4x4 post = 12" in diameter of footing  
                  4x6 post = 14" in diameter of footing  
                  6x6 post = 14" in diameter of footing

**LUMBER:**

All lumber used in the construction of the deck shall be preservative-treated wood or be of natural decay resistant wood (heartwood of redwood, black walnut, black locust or cedar) in accordance with The Residential Code of New York State, R504.3 Materials.

**FLOOR JOIST:**

Floor joist must comply with The Residential Code of New York State, Section Table R502.3.1(2). Floor joist spans must be sized in accordance with the following table. The table is based on a 40-psi live load with a deflection limit of 1/360 using pressure treated southern pine fir #2 lumber.

<u>Joist size</u>	<u>2 x 6</u>	<u>2 x 8</u>	<u>2 x 10</u>	<u>2 x 12</u>
12"O.C.	10'-9"	14'-2"	18'-0"	21'-9"
16"O.C.	9'-9"	12'-10"	16'-1"	18'-10"
19.2"O.C.	9'-2"	11'-6"	14'-8"	17'-2"
24"O.C.	8'-6"	11'-0"	13'-1"	15'-5"

**CANTILEVER:**

The maximum cantilever allowed by the code is two feet (2'). For longer cantilevers, a set of calculations proving the code design limits and safety of the extended length are being met. These calculations must be signed and sealed by a New York State licensed architect or engineer.

## **LANDINGS AT DOORS:**

### **R311.4.3 Landings at doors.**

There shall be a floor or landing on each side of each exterior door. The floor or landing at the exterior door shall not be more than 1.5 inches (38 mm) lower than the top of the threshold. The floor or landing at exterior doors other than the exit door required by Section R311.4.1 shall not be required to comply with this requirement but shall have a rise no greater than that permitted in Section R311.5.3. The landing shall be permitted to have a slope not to exceed 0.25 unit vertical in 12 units horizontal (2-percent).

### **Exceptions:**

1. Where a stairway of three or fewer risers is located on the exterior side of a door, other than the required exit door, a landing is not required for the exterior side of the door provided the door, other than an exterior storm or screen door does not swing over the stairway.
2. The exterior landing at an exterior doorway shall not be more than 81/4 inches (209 mm) below the top of the threshold, provided the door, other than an exterior storm or screen door does not swing over the landing.
3. The height of floors at exterior doors other than the exit door required by Section R311.4.1 shall not be more than 81/4 inches (209 mm) lower than the top of the threshold.

The width of each landing shall not be less than the door served. Every landing shall have a minimum dimension of 36 inches (914 mm) measured in the direction of travel.

## **METAL CONNECTORS:**

The following are the locations and model numbers of the metal connectors to be used. The examples given are Simpson Connectors. Any approved metal connector can be used. All holes in connectors require a nail. Deck screws may not be used on any metal connectors. All nails and connectors used with pressure treated lumber must be designed for pressure treated lumber in order to prevent decay of the fastener.

- |   |                          |                        |
|---|--------------------------|------------------------|
| - | Post to Concrete Footing | Simpson ABEFF or Equal |
| - | Post to Girder           | Simpson LPC4 or Equal  |
| - | Joist to Girder          | Simpson H3 or Equal    |
| - | Joist to Ledger Board    | Simpson LU210 or Equal |

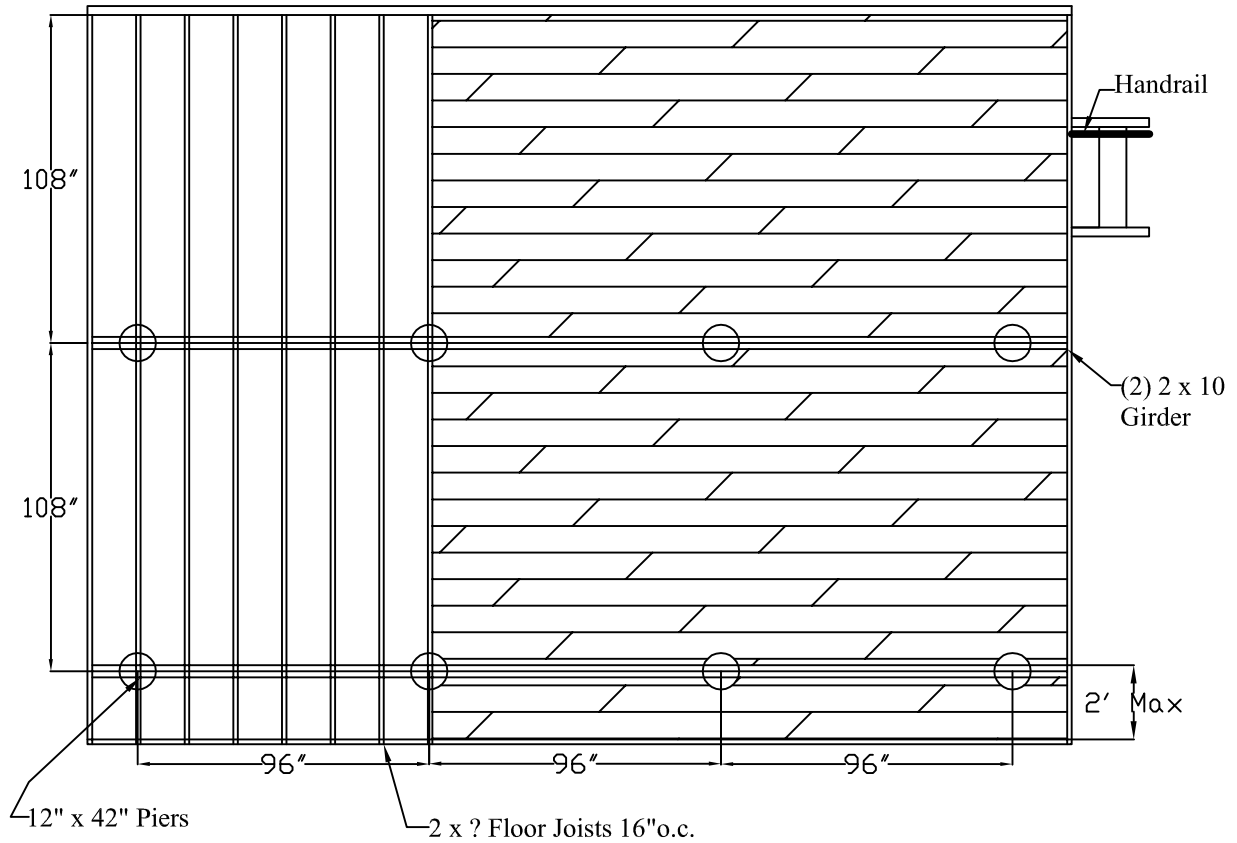
## **DECK ATTACHMENT:**

Required exterior exit balconies, stairs and similar exit facilities shall be positively anchored to the primary structure to resist both vertical and lateral forces. Such attachment shall not be accomplished by use of toenails or nails subject to withdrawal.

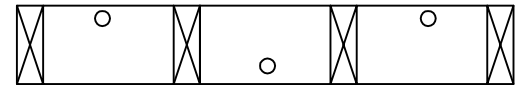
## **STAIRS, GUARDS AND HANDRAILS:**

See attached drawings.

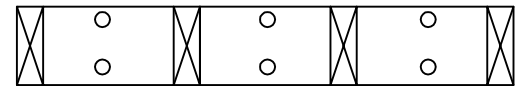
# TYPICAL DECK DRAWING REQUIREMENTS



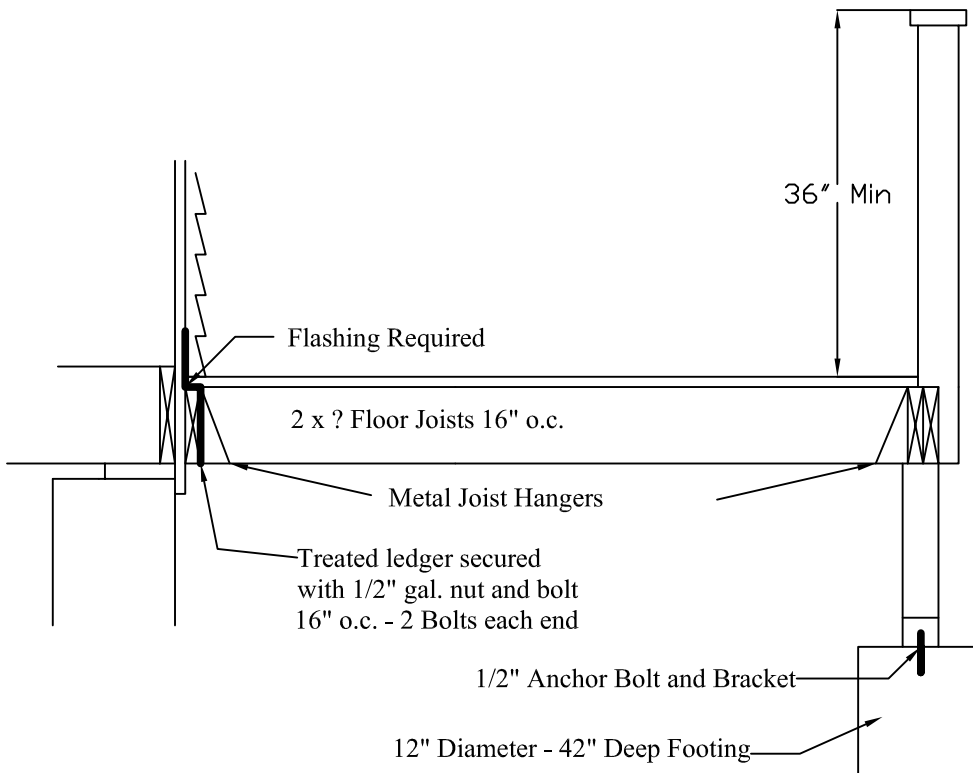
## LEDGER BOARD ATTACHMENT



Joist span 9' or less - Bolts spaced 16" o.c. staggered



Joist span greater than 9' - 2 Rows bolts spaced 16" o.c.



# HANDRAILS AND GUARDS

**§RR311.5.6 Handrails.** Handrails shall be provided on at least one side of each continuous run of treads or flight with four or more risers.

**§RR311.5.6.1 Height.** Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

**§RR311.5.6.2 Continuity.** Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1-1/2 inch (38 mm) between the wall and the handrails.

**Exceptions:**

1. Handrails shall be permitted to be interrupted by a newel post at the turn.
2. The use of a volute, turnout, starting easing or starting newel shall be allowed over the lowest tread.

**§RR311.5.6.3 Handrail grip size.** All required handrails shall be of one of the following types or provide equivalent graspability.

1. Type I. Handrails with a circular cross section shall have an outside diameter of at least 1-1/4 inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6-1/4 inches (160 mm) with a maximum cross section of dimension of 2-1/4 inches (57 mm).

2. Type II. Handrails with a perimeter greater than 6-1/4 inches (160 mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of 3/4 inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16 inch (8 mm) within 7/8 inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least 3/8 inch (10 mm) to a level that is not less than 13/4 inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1-1/4 inches (32 mm) to a maximum of 23/4 inches (70 mm). Edges shall have a minimum radius of 0.01 inches (0.25 mm).

**§RR312.1 Guards required.** Porches, balconies, ramps or raised floor surfaces located more than 30 inches (762 mm) above the floor or grade below shall have guards not less than 36 inches (914 mm) in height. Open sides of stairs with a total rise of more than 30 inches (762 mm) above the floor or grade below shall have guards not less than 34 inches (864 mm) in height measured vertically from the nosing of the treads.

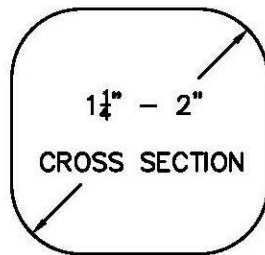
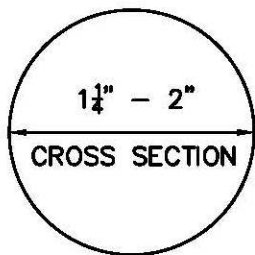
Porches and decks which are enclosed with insect screening shall be provided with guards where the walking surface is located more than 30 inches (762 mm) above the floor or grade below.

**§RR312.2 Guard opening limitations.** Required guards on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails or ornamental closures which do not allow passage of a sphere 4 inches (102mm) or more in diameter.

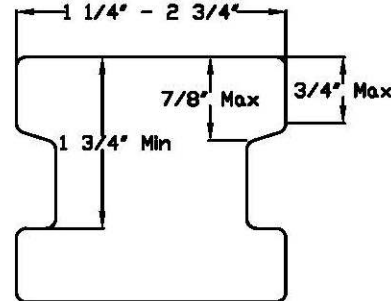
**Exceptions:**

1. 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 (152 mm) cannot pass through.
2. Openings for required guards on the sides of stair treads shall not allow a sphere 4 3/8 inches (107 mm) to pass through.

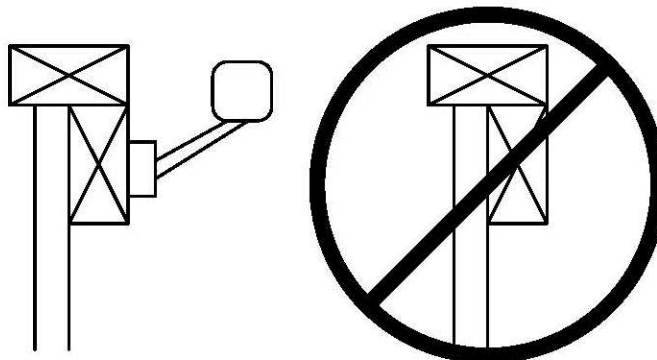
TYPE I HANDRAILS



TYPE II HANDRAIL



TYPICAL HANDRAIL INSTALLATION



# §RR311.5 Stairways.

**§RR311.5.1 Width.** Stairways shall not be less than 36 inches (914 mm) in clear width at all points above the permitted handrail height and below the required headroom height. Handrails shall not project more than 4.5 inches (114 mm) on either side of the stairway and the minimum clear width of the stairway at and below the handrail height, including treads and landings, shall not be less than 31.5 inches (787 mm) where a handrail is installed on one side and 27 inches (698 mm) where handrails are provided on both sides.

**Exception:** The width of spiral stairways shall be in accordance with §RR311.5.8.

**§RR311.5.2 Headroom.** The minimum headroom in all parts of the stairway shall not be less than 6 feet 8 inches (2036 mm) measured vertically from the sloped plane adjoining the tread nosing or from the floor surface of the landing or platform.

**§RR311.5.3 Stair treads and risers.**

**§RR311.5.3.1 Riser height.** The maximum riser height shall be 8-1/4 inches (209 mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

**§RR311.5.3.2 Tread depth.** The minimum tread depth shall be 9 inches (229 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured as above at a point 12 inches (305) mm from the side where the treads are narrower. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point. Within any flight of stairs, the greatest winder tread depth at the 12 inch (305 mm) walk line shall not exceed the smallest by more than 3/8 inch (9.5 mm).

**§RR311.5.3.3 Profile.** The radius of curvature at the leading edge of the tread shall be no greater than 9/16 inch (14.3 mm). A nosing not less than 3/4 inch (19 mm) but not more than 1 1/4 inch (32 mm) shall be provided on stairways with solid risers. The greatest nosing projection shall not exceed the smallest nosing projection by more than 3/8 inch (9.5 mm) between two stories, including the nosing at the level of floors and landings. Beveling of nosing shall not exceed 1/2 inch (12.7 mm). Risers shall be vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 (0.51 rad) degrees from the vertical. Open risers are permitted, provided that the opening between treads does not permit the passage of a 4-inch diameter (102 mm) sphere.

**Exceptions:**

1. A nosing is not required where the tread depth is a minimum of 11 inches (279 mm).
2. The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.

**§RR311.5.4 Landings for stairways.** There shall be a floor or landing at the top and bottom of each stairway.

**Exception:** A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided a door does not swing over the stairs.

A flight of stairs shall not have a vertical rise larger than 12 feet (3658 mm) between floor levels or landings.

The width of each landing shall not be less than the width of the stairway served. Every landing shall have a minimum dimension of 36 inches (914 mm) measured in the direction of travel.

**§RR311.5.5 Stairway walking surface.** The walking surface of treads and landings of stairways shall be sloped no steeper than one unit vertical in 48 inches horizontal (2-percent slope).

