



# Residential Decks

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This handout is designed to help you build your deck to comply with the 2012 International Residential Building code as modified by the City municipal code Title 19. Prior to starting any development project, it is the applicant's responsibility to obtain a building permit for any and all improvements requiring such. Informational handouts should not be used as substitute for actual codes or applications. It is recommended that all decks be inspected annually either by the homeowner or a professional inspector. The North American Deck and Railing Association and other agencies have inspection checklists are available to help with public awareness for deck safety.

There are two types of decks.

1. **Freestanding** – a deck that supports itself and is not attached to any other structure.
2. **Attached** – a deck that is attached to another structure by use of a ledger or other approved method.

**\*All newly constructed, altered or replaced decks are required to have a building permit**

**Exceptions:**

- Direct replacement of part of the decking (not replacement of entire deck) without modification of structural elements and if total cost, labor and materials does not exceed \$15k
- Freestanding decks not higher than 30 inches from adjacent grades within 3' of deck.

**Note:** Setback and zoning restrictions may apply to some situations; you should ensure that any non-permitted deck or structure is not in violation of any zoning or local covenant requirements.

## **Application Materials and Review:**

Submit an application, two sets of plans and specifications for review. \*

All plans must include the following:

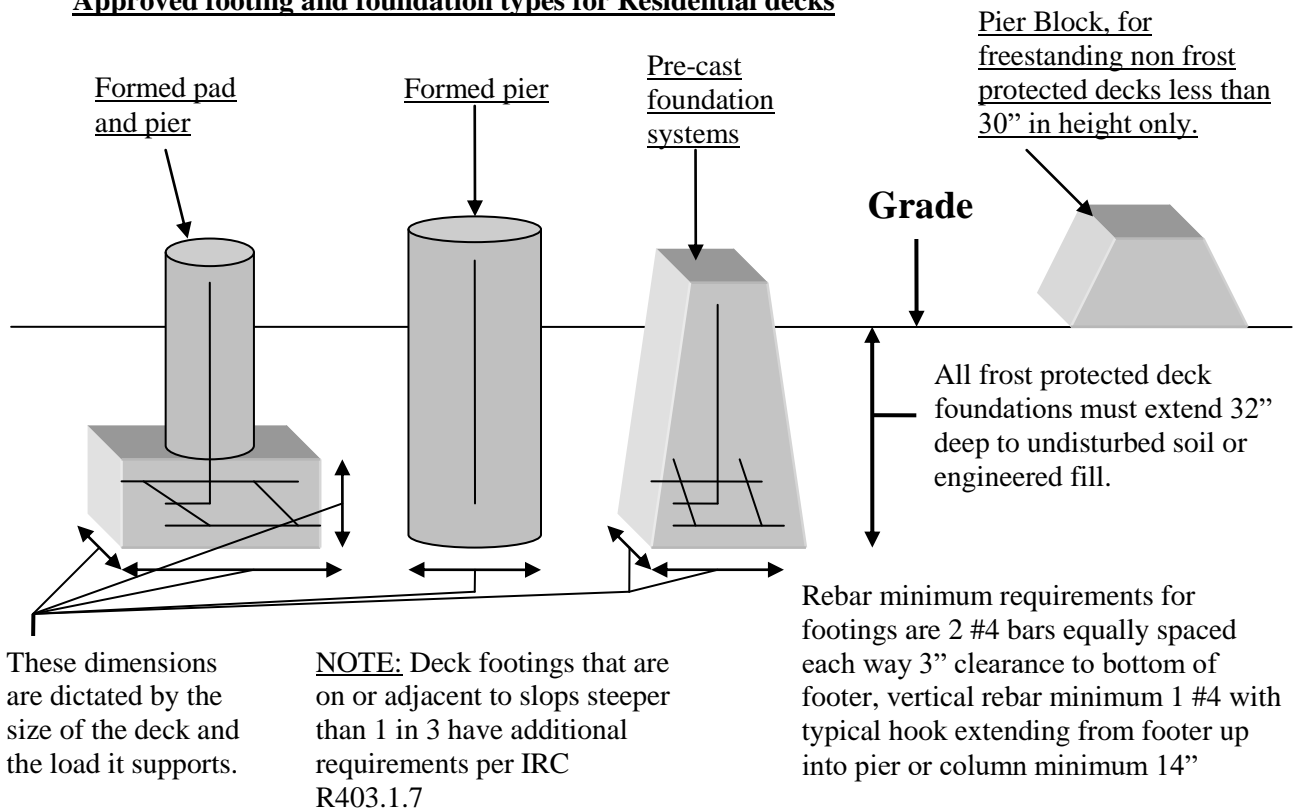
- Site plan of the entire lot including existing building, location of deck or patio, and distance to each property line. (Zoning setback/distance from property line requirements as defined in CBJ Title 49 apply to all decks)
- A side view showing the lowest footing to the highest point of work (guardrail or roof)
- A plan view showing type of framing material and all dimensions internal and external, to include species of wood, member spans, measurements of piers, beams, joists, girders, rafters and decking.
- A detail of connection to the existing building, connections to posts, girders and ledgers including fasteners, hangers and flashing.
- Computer drawings are acceptable as long as they include all of the above requirements.

**Materials** – All materials used in decks must be approved for exterior use (full exposure to weather). Lumber must be pressure preservative treated or of an approved species that is naturally resistant to decay. Field cut ends, notches and drilled holes of pressure treated wood shall be retreated in the field accordance with AWWPA M4. Fasteners (screws, nails, hangers & brackets) must be stainless steel, hot dipped galvanized, silicon bronze, copper, ceramic coated or other approved fasteners for exterior use and or use with preservative treated lumber.

**Load Capacity & Design** – Standard residential deck framing is required to sustain a 50 lb live load and 10 lb. dead load for all walking surfaces. Beam size, joist size and span lengths must meet the minimum requirements listed in the 2012 IRC & 2012 IBC. Any design submitted that does not meet the criteria may need the stamped approval of a State licensed engineer.

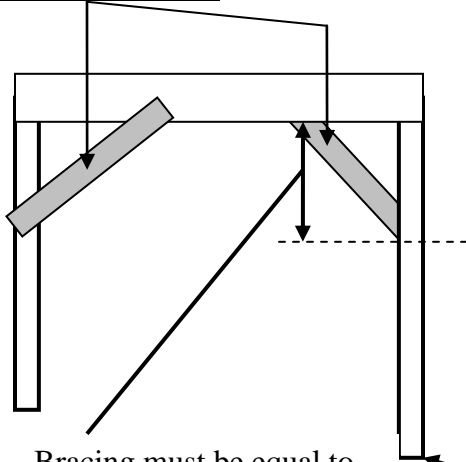
**Footings / Foundations** – For decks that require footings, the footings must be sized to carry the applied loads and be no less than 32 inches below the grade. The suggested size of concrete pads to support ground level decks are one square foot of bearing concrete 10 inches thick with two #4 rebar each way to form a square. Where the soil conditions are known to have a bearing capacity of 2000 PSF or better each pad should support 20 square feet. For decks with a second story or roofing system the footing size will need to be increased accordingly. Concrete columns (Sono-tubes etc.) used on footers must be anchored to the footers with a minimum of one #4 rebar that extends up to the minimum of 14 inches in center of column. Posts that sit directly onto a concrete footer must be restrained from lateral displacement from the footer with use of approved connector.

**Approved footing and foundation types for Residential decks**



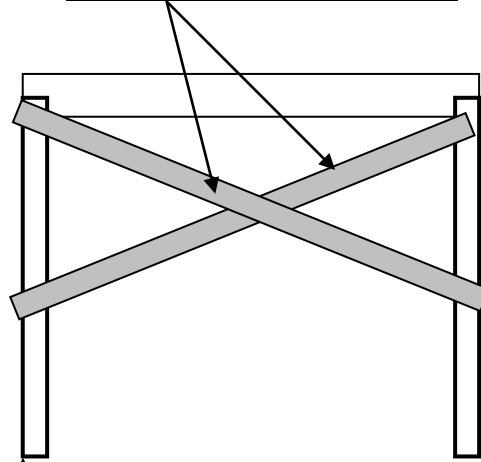
**Posts & Bracing** – Wood columns and posts shall not be less in nominal size than 4x4 and steel columns shall not be less than 3” in diameter standard pipe or approved equivalent. Posts that support freestanding decks over 30” in height must have bracing to resist lateral wind and seismic loading. Decks and deck roof structures that are supported at a ledger connection must be braced for lateral loads when length of joists exceed 1/3 width of deck as measured along ledger connection. Bracing may be accomplished by any of the methods described below or other bracing methods that meet standard construction or engineered design. Fasteners used to connect bracing to deck must be lag bolts, through bolts or other approved mechanical connection.

**Gusset or knee bracing**

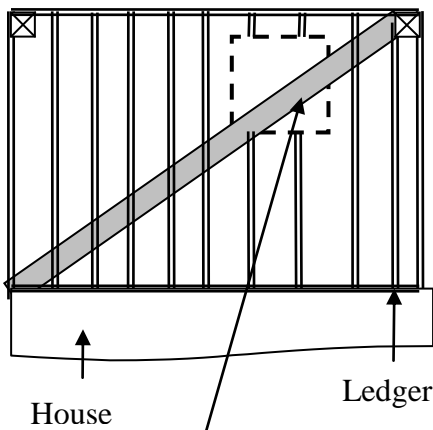


Bracing must be equal to or greater than 1/3 the post height from grade, placed at approximately 45 deg angle.

**Cross bracing or “X” bracing**



Posts must bear directly on approved post base connectors or be embedded directly into the foundation system



**Diagonal bracing** applied to the underside of the joists, minimum 2x6 fastened with 2 each 3 ½ 16d nails to each

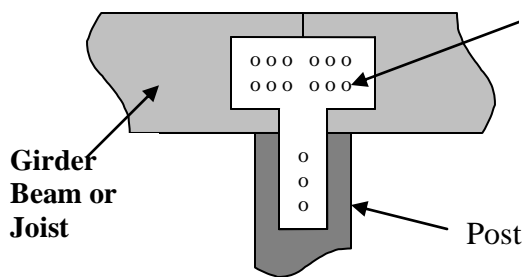
**Allowable Post Heights:**

4”x 4” = 8’

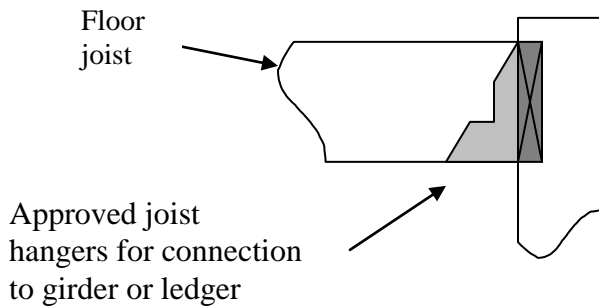
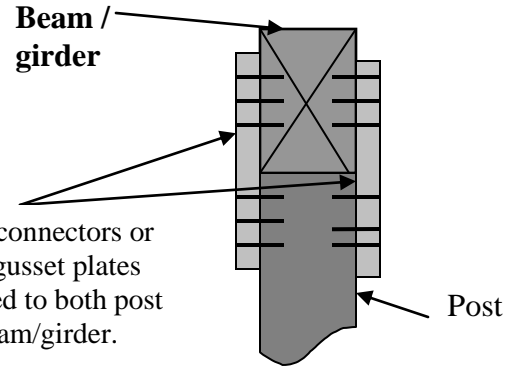
4”x 6” = 8’

6”x 6” = 14’

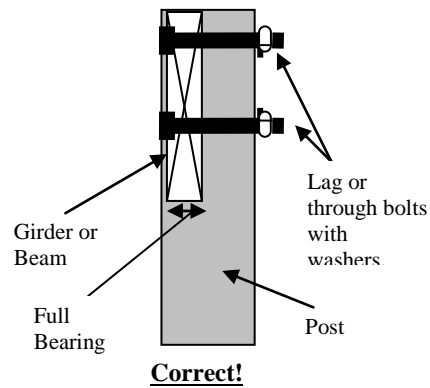
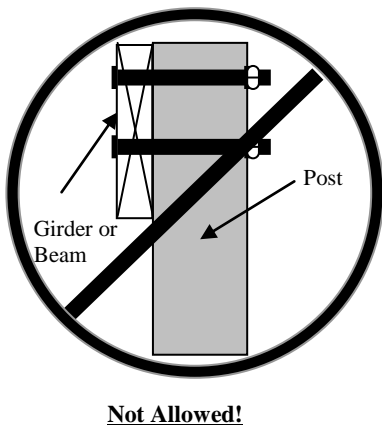
**Girders & Joists** – The ends of each joist, beam or girder shall not have less than 1.5 inches of bearing on wood or metal and not less than 3 inches on masonry, concrete or by the use of approved hangers. **Deck joists must be sized and spaced to hold a 50lb per sq. foot live load and a 10 lb per sq. foot dead load.**



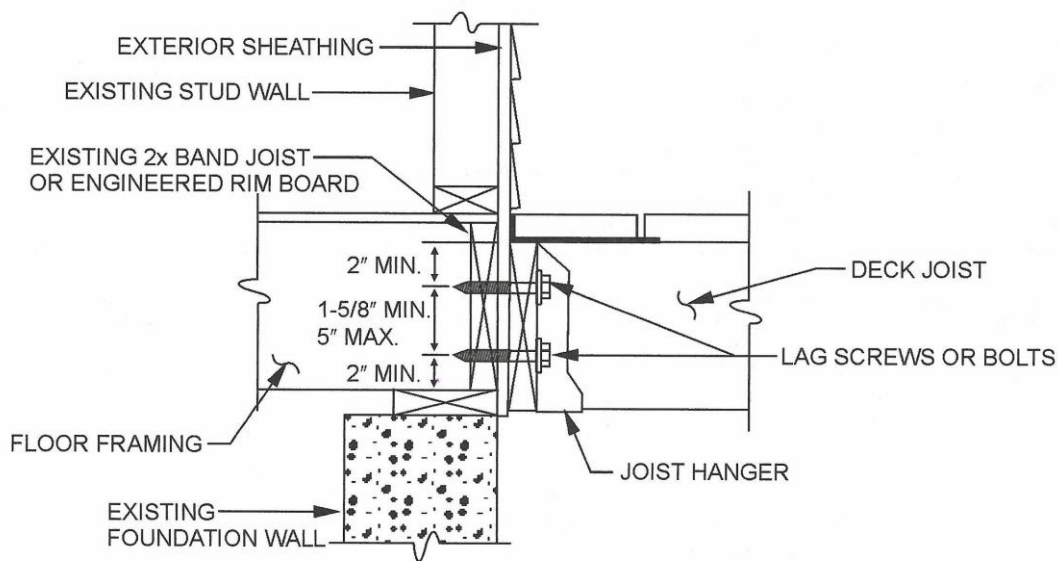
When girders, beams or joists sit on top of posts an approved mechanical connection must be made on both sides.



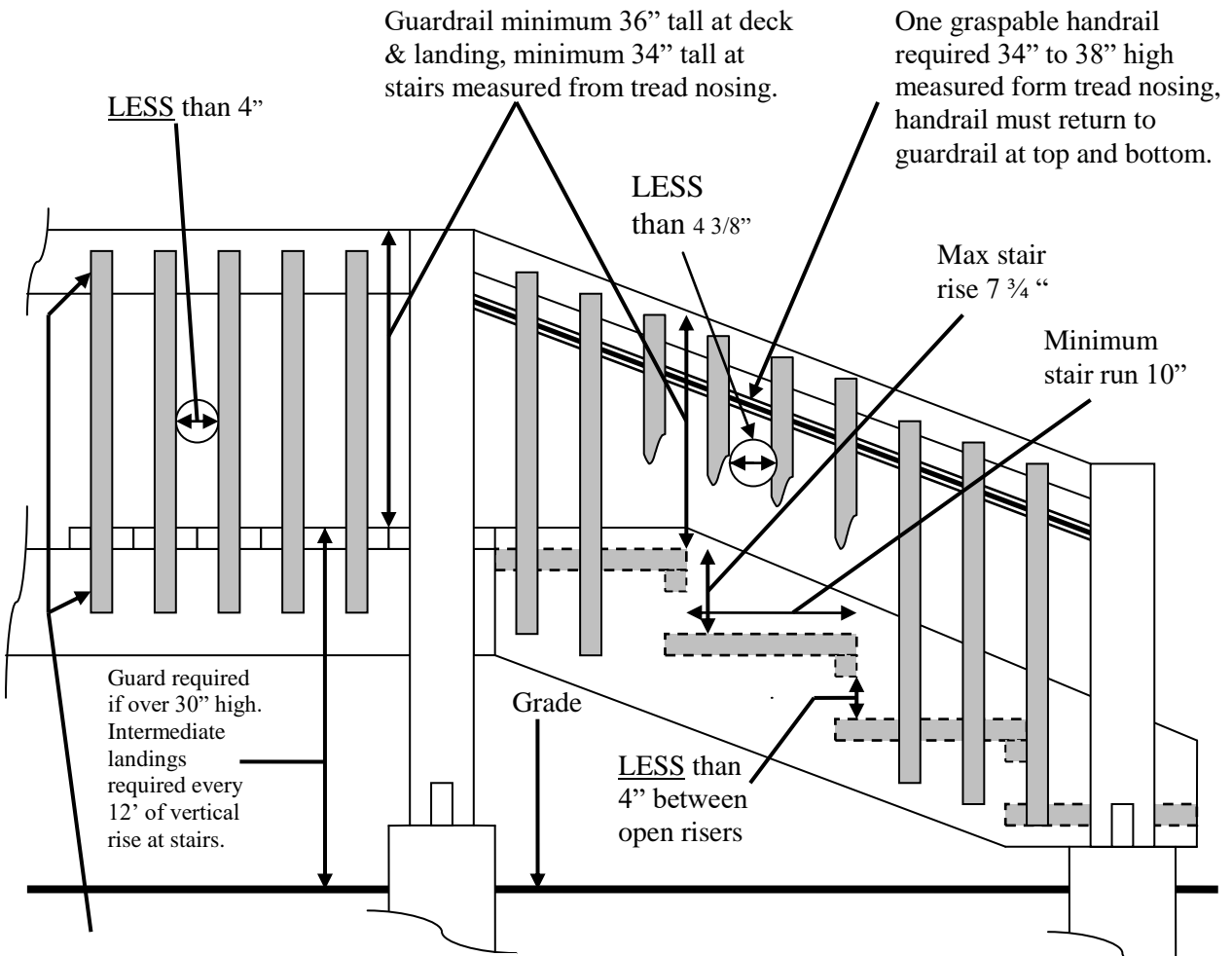
Typical allowable PT joist spans with 16" spacing:	
2"x 6"	= 8'11"
2"x 8"	= 11'4"
2"x10"	= 13'10"
2"x12"	= 16'1"



**Ledger Connection** – When an exterior wall is used to support a deck, it must be attached by a minimum of two rows of sufficient galvanized lag screws and washers. They must penetrate a minimum of 1 ¾ inches into existing 2x8, 2x10, or 2x12 wooden header band or rim joist which must bear directly on foundation wall or wall framing. Through bolting may be substituted. If there is no header, band or rim joist, fasteners must connect to the wall framing. The upper row of lag bolts is spaced at maximum 24 inches on center and extends through the ledger into header or rim joist of the existing structure. The lower row of lag bolts is spaced at 48 inches on center maximum and extends through the deck ledger into the rim joist or header of existing structure. The lag screws must be sized to resist both vertical and lateral loads, this connection must be available for inspection; if it is not, this method of support is not permitted and the deck must be self supported. Existing exterior coverings (siding) must be removed so that the ledger connects directly to the rim joist or wall framing. The ledger must be continuously flashed and sealed to prevent water from entering the wall assembly. Decks that attach to cantilevered floor systems must meet the mechanical connection requirements of the 2012 IRC and the floor system must be capable of supporting the added load at the cantilever, it is the builder’s responsibility to provide these calculations for review. **For deck lateral loads hold-down tension devices shall be provided in not less than two location, and shall have an allowable stress design capacity of not less than 1,500 lbs. See Simpson deck ties for lateral load connections DTT2Z which satisfies this IRC provision. See bottom figure.**



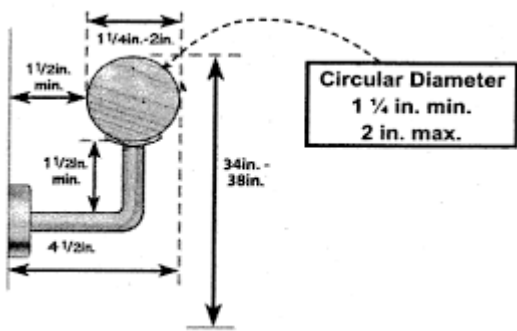
**Stairs /Guardrails / Handrails** – All decks that have walking surfaces 30” above grade must have a guardrail no less than 36 inches in height. The guard rail must be mechanically connected to the deck and or house to resist a 200lb lateral load in either direction. The intermediate/ornamental closures or pickets must be spaced less than 4 inches apart so that a 4” sphere **cannot** pass between at any point. One compliant handrail is required on all sets of stairs that have 4 or more risers. Handrails must be 34” minimum to 38” maximum high as measured from the tread plane at the nosing. Handrail grip size must be Type 1 or Type 2 as described on CBJ handout for Residential Graspable Guardrails or 2012 International Residential Code section R311.7.8.3. The maximum riser height shall be 7¾ inches, risers height’s may not vary more that 3/8 of and inch from the smallest to the largest. The Minimum run depth is 10 inches, tread depths may not vary more than 3/8 of an inch from the shortest to the longest. All stairs must have a floor or landing at the top and the bottom, the width of each landing shall not be less than the stairway served. Every landing shall have a minimum dimension of 36 inches measured in the direction of travel. Open risers on stairs with a total rise of more than 30-inches must be constructed so that the opening between risers is less than 4”.



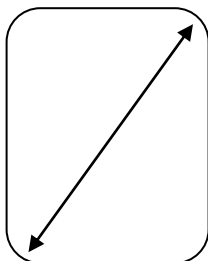
NOTE: If the vertical intermediate rails attach to outside of the deck they must be pre-drilled and fastened with screws, lag bolts or other approved mechanical fastener not subject to withdrawal.

Stair requirements, covered by 2012 International Residential Code sections R311 and R312.

**Type I Handrails**



Noncircular 2.25" max



**Type II Handrails**

