

DECK AND STAIR REQUIREMENTS

GENERAL

Definition Of A Deck: An exterior floor system supported on at least two opposing sides by an adjoining structure and/or posts, piers or independent supports. A deck may be attached to the structure (residence) or may be free standing.

Please submit with your completed application, the zoning approval for the job and two sets of drawings with sufficient clarity to accurately depict the proposed work. All drawings should indicate owner's name, address of job site, and block and lot number. To draw your own plans, it must be for a SINGLE FAMILY DWELLING and you must be owner and occupant of said property. If not you will need drawings by a New Jersey Registered Architect or Professional Engineer.

Decks are to be designed for 40 pound per square foot live load plus dead load.

Guardrails and handrails are to be designed to withstand a concentrated load of 200 pounds.

Lumber for exterior use must be preservative treated, or other naturally durable wood.

Fasteners for preservative treated lumber must be approved for exterior use, and shall be of corrosive resistant material that is compatible with the treated lumber selected, or approved by the manufacturer.

Fasteners for engineered connections (TECO, SIMPSON, etc.) and structural attachments (nails) shall be of the approved type, i.e., supplied by the manufacturer (TECO, SIMPSON, etc.). Deck screws and common galv. nails are NOT permitted in joist hangers, etc., unless approved by manufacturer.

FOOTINGS

Must comply with IBC 2009 NJ Edition.

The footing shall be a minimum of 12 inches in diameter and at depth which is below the frost level (30 inches). Per Table 1809.7 of the 2009 IBC NJ Edition.

The footing can also be eight inches of concrete placed in the bottom of the 30" deep 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 minimum strength of the concrete shall be 2500 psi. Wood must be rated for direct burial by manufacturer, and labels for same must document the use. The diameter of the footing must be a minimum

of two inches larger on all sides of the post. Posts therefore must be centered on the footing.

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

LUMBER

All lumber used in the construction of the deck shall be pressure treated or be of natural decay resistant wood (heartwood of redwood, black wood, black locust or cedar). All carpentry work shall be in accordance with chapter 23 of IBC 2009 NJ Edition, as well as applicable sections of the 2009 IRC NJ Edition. Every piece of treated lumber is labeled for its approved use.

METAL CONNECTORS

The following are the locations and model numbers of the metal connectors to be used. The examples shown are Simpson Connectors. Any approved metal connector can be used.

Post to Concrete Footing -	Simpson ABE44 or equivalent
Post to Girder -	Simpson LPC4 or equivalent
Joist to Girder -	Simpson H3 or equivalent
Joist to Ledger Board -	Simpson LU210 or equivalent

Direct contact of ACQ treated lumber with aluminum, steel, or iron products is not permitted. This includes flashing, lag, and anchor bolts. Utilize the fastener manufacturer or lumber recommendations. This information should be readily available from the fastener supplier.

Girders

Joints in girders must be directly above the support columns. Split girders must be secured together with 2 ½" galvanized bolts. Direct bearing must be provided under girders.

Maximum Span for One Story		Greater than One Story
2-2" x 6"	5'0"	4'0"
3-2" x 6"	6'0"	5'2"
2-2" x 8"	6'4"	5'6"
3-2" x 8"	8'0"	7'0"
2-2" x 10"	8'0"	7'0"
3-2" x 10"	9'0"	8'0"
2-2" x 12"	9'0"	8'0"

Note: 4 x 4 posts may not exceed 8' in height.

FLOOR JOISTS

40 lbs Live Load (Treated SYP)

Size	Spacing on Center	Max. Clear Span
2" x 6"	16"	8' - 6"
	12"	9' - 4"
2" x 8"	16"	11' - 3"
	12"	12' - 4"
2" x 10"	16"	14' - 4"
	12"	15' - 9"
2" x 12"	16"	17' - 5"
	12"	19' - 0"

CANTILEVER

The maximum cantilever allowed by code for floor joist is two feet. For longer cantilevers, a set of calculations proving the code design limits and safety of the extended lengths are being met. These calculations must be signed and sealed by an architect or professional engineer. A cantilever shall not be attached to a house cantilever or to the house brick veneer.

LEDGER

A board against the house securely attached with ½" diameter galvanized lag bolts of sufficient length shall be bolted firmly to a rim joist. Lag bolts shall be spaced in a staggered pattern, in accordance w/R 502 of the 2009 IRC NJ Edition. Galvanized washers shall be installed between the bolt head and wood. Through bolting with a washer on the outside and a washer and nut on the inside of the building is also acceptable and required for houses with engineered wood construction. Lateral bracing per 502.2.2.3 must also be provided.

FLASHING - MUST BE COMPATIBLE WITH LUMBER USED

Provide continuous corrosion resistant flashing along the ledger in such a manner as to prevent the passage of moisture to the wall, any untreated lumber, or siding. Exception: Flashing shall not be required if installation is against vinyl siding, metal siding (provided a shim is used) or masonry. Shims must not crush the siding when bolts are tightened.

GUARDRAILS

Guardrails on all decks and stairs 30" or more above grade to be a minimum of 36" high above deck and minimum of 36" high measure above stair nosing. They shall not have an ornamental pattern that would provide a ladder effect. Guardrails shall be constructed to withstand a concentrated load of 200 lbs. applied at any point and direction along the top railing member. The infill area of the guard system shall be constructed to withstand a horizontal concentrated load of 200 lbs applied on a one sq. ft. area at any point. Guardrail baluster openings are to be less than 4" wide and unclimbable.

A stairway with three or more risers is required to have guardrails on both sides measuring 34" or more in height above the leading edge of the tread. Balusters must have two screws or nails at the top and the bottom and openings less than 4".

HANDRAILS

Handrails are required on all stairs with four or more risers.

Handrail grip size to be a circular cross section with an outside dimension of 1 1/4" to 2", and a perimeter dimension of 4" to 6 1/4" with largest cross sectional dimension of 2 1/4". All handrails shall be closed with returns at top and bottom.

Handrails to be 30" to 38" high measured above the stair nosing.

Handrails may project from each side of a stairway 3 1/2" into the required width of 36".

Handrails are to be smooth and free of any sharp edges or splinters. A handrail and any wall or other surface adjacent to the handrail shall be free of any sharp or abrasive elements. The clear space between the handrail and adjacent wall or surface shall not be less than 1 1/2". Edges shall have a minimum radius of 1/8".

STAIRWAYS

Stairs are to be a minimum of 36" wide.

Minimum tread width to be 9". Maximum riser height shall be no greater than 8 1/4". A 3/4" to 1 1/4" nosing is required on treads less than 11" wide.

Stair risers are to be closed or to be open less than 4".

Triangle opening formed by riser/tread and bottom of guardrail is to be less than 6" diameter.

Dimensional uniformity: All risers to be equal, all treads to be equal. There shall not be a variation exceeding 3/8" in the depth of adjacent treads or in the heights of adjacent risers throughout the total run of steps. The tolerance between the largest and smallest riser and tread shall not exceed 3/8 in any flight of stairs. Exception: Where the bottom riser adjoins a sloping walk or driveway which has an established grade and serves as a

landing, the variation in height of the bottom riser shall not exceed three inches for every three feet of stairway width.

LATERAL BRACING

All detached decks, decks 8' above grade, or where situations warrant, require diagonal bracing between girder and post.

Joist must also be braced laterally per section R502.2.2.3 of the 2009 IRC NJ Edition

CONNECTIONS

All connectors, nails, screws, bolts, and hardware shall be hot-dipped zinc coated (galvanized), stainless steel, silicon bronze, copper, or other corrosion resistant material.

INSPECTIONS REQUIRED

1. The bottom of footing before placing concrete
2. Frame-before covering with decking
3. Final

DECK AND STAIR PERMIT SUBMISSION REQUIREMENTS

In order to process the building permits for decks, and stairs, the following information is required:

- Zoning Approval.
- Wood material used.
- Foundation system used Provide diameter/dimension of concrete piers and depth and exact location of piers footings with post connection to footings.
- Height of deck above grade.
- Girder size, spacing and span with type of attachment/connector to posts and joist hangers if required. Direct continuous bearing.
- Size of ledger at house with flashing, joist hangers and bolt size and spacing and lateral support.
- Joist size, spacing and span and attachment.
- Decking size, spacing, span and type of galvanized connectors.
- All stairs construction details.
- Guardrail and handrail details on deck and stairs.
- Foundation/and anchorage system for stairs stringers and handrails and/or guardrails.

- $\frac{1}{4}''=1' = 0''$ scale drawing showing exact location of all structural members .e.g., posts, girders, joists, etc.
- Owner to sign all permit documents, such as drawings, notes, sketches, etc., as preparer.

CHAPTER 5 FLOORS

SECTION R501 GENERAL

R501.1 Application. The provisions of this chapter shall control the design and construction of the floors for all buildings including the floors of *attic* spaces used to house mechanical or plumbing fixtures and *equipment*.

R501.2 Requirements. Floor construction shall be capable of accommodating all loads according to Section R301 and of transmitting the resulting loads to the supporting structural elements.

SECTION R502 WOOD FLOOR FRAMING

R502.1 Identification. Load-bearing dimension lumber for joists, beams and girders shall be identified by a grade *mark* of a lumber grading or inspection agency that has been *approved* by an accreditation body that complies with DOC PS 20. In lieu of a grade *mark*, a certificate of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.

R502.1.1 Preservative-treated lumber. Preservative treated dimension lumber shall also be identified as required by Section R319.1.

R502.1.2 Blocking and subflooring. Blocking shall be a minimum of utility grade lumber. Subflooring may be a minimum of utility grade lumber or No. 4 common grade boards.

R502.1.3 End-jointed lumber. *Approved* end-jointed lumber identified by a grade *mark* conforming to Section R502.1 may be used interchangeably with solid-sawn members of the same species and grade.

R502.1.4 Prefabricated wood I-joists. Structural capacities and design provisions for prefabricated wood I-joists shall be established and monitored in accordance with ASTM D 5055.

R502.1.5 Structural glued laminated timbers. Glued laminated timbers shall be manufactured and identified as required in ANSI/AITC A190.1 and ASTM D 3737.

R502.1.6 Structural log members. Stress grading of structural log members of nonrectangular shape, as typically used in log buildings, shall be in accordance with ASTM D 3957. Such structural log members shall be identified by the grade *mark* of an *approved* lumber grading or inspection agency. In lieu of a grade *mark* on the material, a certificate of inspection as to species and grade issued by a lumber-grading or inspection agency meeting the requirements of this section shall be permitted to be accepted.

R502.1.7 Exterior wood/plastic composite deck boards. Wood/plastic composites used in exterior deck boards shall comply with the provisions of Section R317.4.

R502.2 Design and construction. Floors shall be designed and constructed in accordance with the provisions of this chap-

ter, Figure R502.2 and Sections R317 and R318 or in accordance with AF&PA/NDS.

R502.2.1 Framing at braced wall lines. A load path for lateral forces shall be provided between floor framing and *braced wall panels* located above or below a floor, as specified in Section R602.10.6.

R502.2.2 Decks. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. For decks with cantilevered framing members, connections to exterior walls or other framing members, shall be designed and constructed to resist uplift resulting from the full live load specified in Table R301.5 acting on the cantilevered portion of the deck.

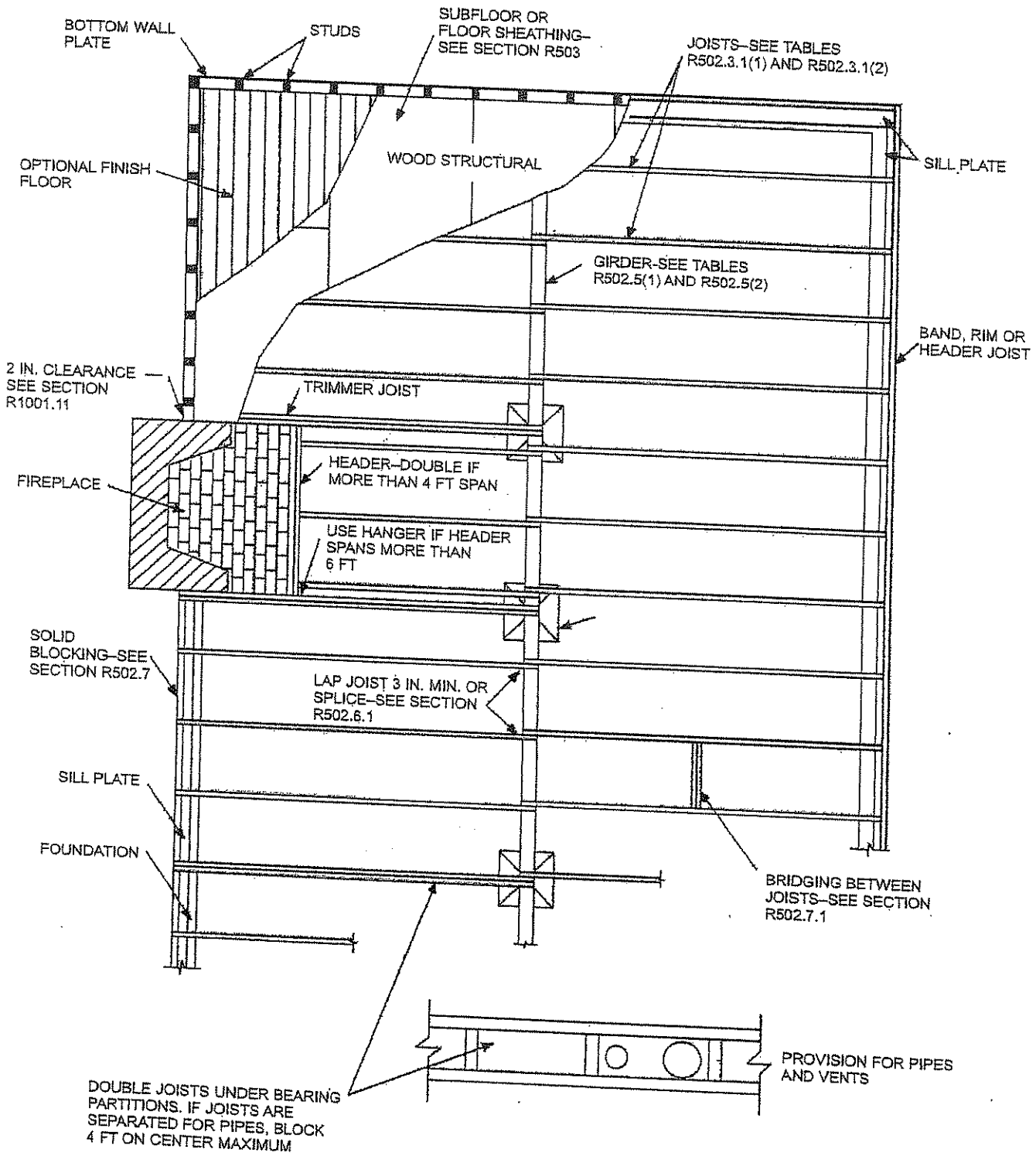
R502.2.2.1 Deck ledger connection to band joist. For decks supporting a total design load of 50 pounds per square foot (2394 Pa) [40 pounds per square foot (1915 Pa) live load plus 10 pounds per square foot (479 Pa) dead load], the connection between a deck ledger of pressure-preservative-treated Southern Pine, incised pressure-preservative-treated Hem-Fir or *approved* decay-resistant species, and a 2-inch (51 mm) nominal lumber band joist bearing on a sill plate or wall plate shall be constructed with 1/2-inch (12.7 mm) lag screws or bolts with washers in accordance with Table R502.2.2.1. Lag screws, bolts and washers shall be hot-dipped galvanized or stainless steel.

R502.2.2.1.1 Placement of lag screws or bolts in deck ledgers. The lag screws or bolts shall be placed 2 inches (51 mm) in from the bottom or top of the deck ledgers and between 2 and 5 inches (51 and 127 mm) in from the ends. The lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger.

R502.2.2.2 Alternate deck ledger connections. Deck ledger connections not conforming to Table R502.2.2.1 shall be designed in accordance with accepted engineering practice. Girders supporting deck joists shall not be supported on deck ledgers or band joists. Deck ledgers shall not be supported on stone or masonry veneer.

R502.2.2.3 Deck lateral load connection. The lateral load connection required by Section R502.2.2 shall be permitted to be in accordance with Figure R502.2.2.3. Hold-down tension devices shall be installed in not less than two locations per deck, and each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N).

R502.2.2.4 Exterior wood/plastic composite deck boards. Wood/plastic composite deck boards shall be installed in accordance with the manufacturer's instructions.



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

FIGURE R502.2 FLOOR CONSTRUCTION