United City of Yorkville
Deck Construction Guide
2018 IRC

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JULIE- call before you dig- #811 or https://illinois1call.com/index.html
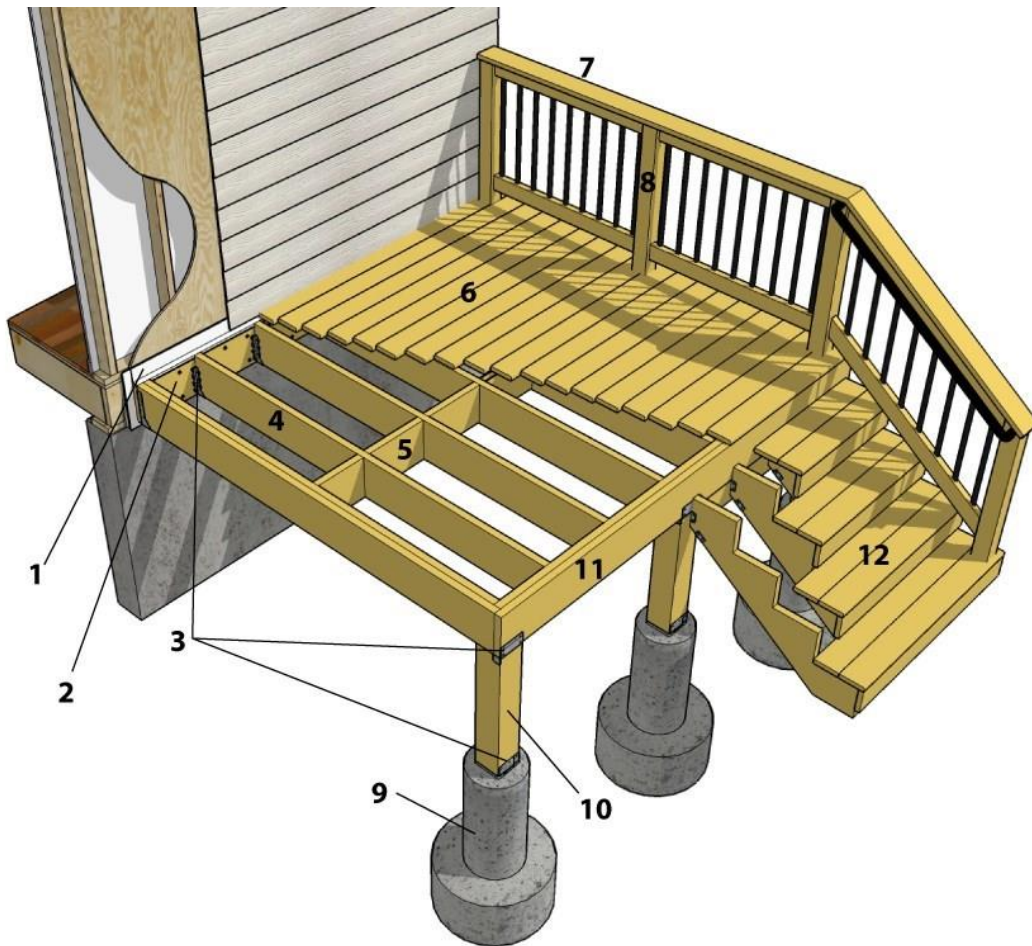
Anatomy of a deck

A deck is made of many different parts that work together to ensure that your deck is safe for you and your family and that it will stand the test of time. The image below will give you a quick reference to the working parts of a deck and how all the parts come together for a high-quality finished product.

|			
1. Flashing	2. Ledger	3. Hardware	4. Joists
5. Bridging	6. Decking	7. Railing	8. Railing Posts
9. Footings	10. Support Posts	11. Beams	12. Stairs

How to determine footing size

In order to determine the proper size for your footings you will need to establish how much total weight they are going to have to support and what kind of soil they are covering. To calculate the load you should use 40lbs per square foot live for load (these are variable loads that are dynamic such as the weight of people and furniture) and 15 lbs per square foot for dead load (this is the weight of the materials used for the construction of the deck) for a total of 55 lbs per square foot total load.

If you were building a 10x10 deck attached to a house with 2 footings on the corners you could calculate the loads for the footings in the following way. First draw a line dividing the deck into two halves between the house and the footings. The load for the section nearest the house will be transferred back to the ledger board and carried down to the house foundation. The remaining half of the deck will again be split into two parts to be supported by the two corner footings. This is called the tributary load. If you multiply the area of this section 5' x 5' you will get 25 square feet. You can multiply this area by 55 lbs per square foot loading to come up with 1375 lbs total load. Once you know the total load you can use the chart to determine the proper footing size.
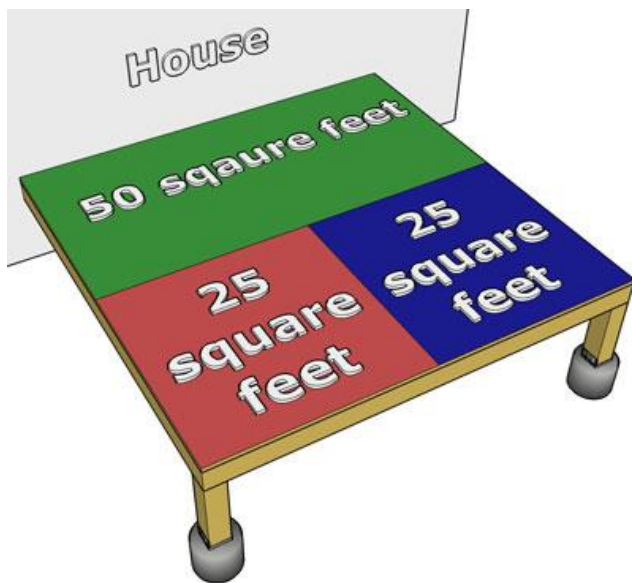
**Circular Footings**
Maximum Allowable Load Per Footing, in Lbs

Soil Type		Gravel	Sand	Clay
Allowable Pressure (Lbs /Sq Ft)		3000	2000	1500
Footing Size (inches)	12	2300	1500	1100
	13	2700	1800	1300
	14	3200	2100	1600
	15	3600	2400	1800
	16	4100	2700	2000
	17	4700	3100	2300
	18	5300	3500	2600
	19	5900	3900	2900
	20	6500	4300	3200
	21	7200	4800	3600
	22	7900	5200	3900
	23	8600	5700	4300
	24	9400	6200	4700

* Support Posts*

The minimum size for the vertical support posts on all decks is 4x4. The post must be attached to the footing using an approved support bracket. The top portion of the post must be notched to receive the support beam, or an approved post cap may be used.
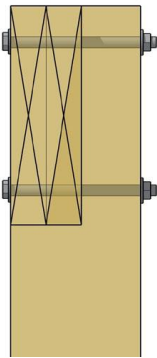

Beam notch in support
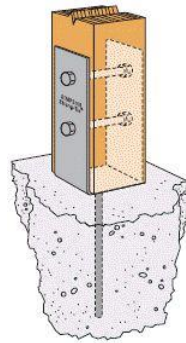
6x6 support bracket

Beam and Floor Joist Sizing

Use the charts included in the rear of this packet to calculate the right size of beam and joist size for your application. This process will help to ensure that the number of piers you plan to install will work with the spans of the beams and floor joists that will be used in your project.

Ledger Board Assembly

The ledger board is the portion of the deck that attaches to the home and provides most of the support for that portion of the deck. There are many different types of hardware that may be used to attach the ledger board to the home. The manufactures direction as to the number of fasteners and their placement must be used to ensure that the deck is properly supported.   The image bellow will give you an idea of the parts that make up the ledger board assembly.
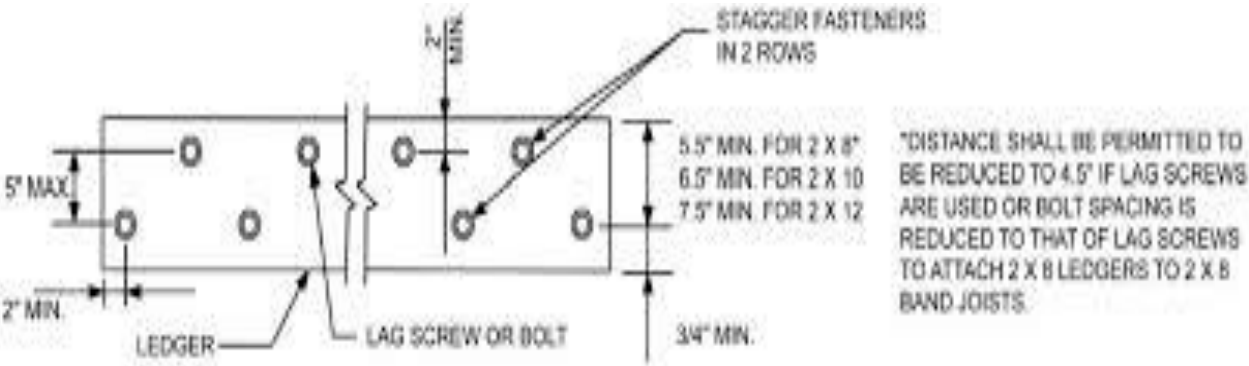
For SI: 1 inch = 25.4 mm.
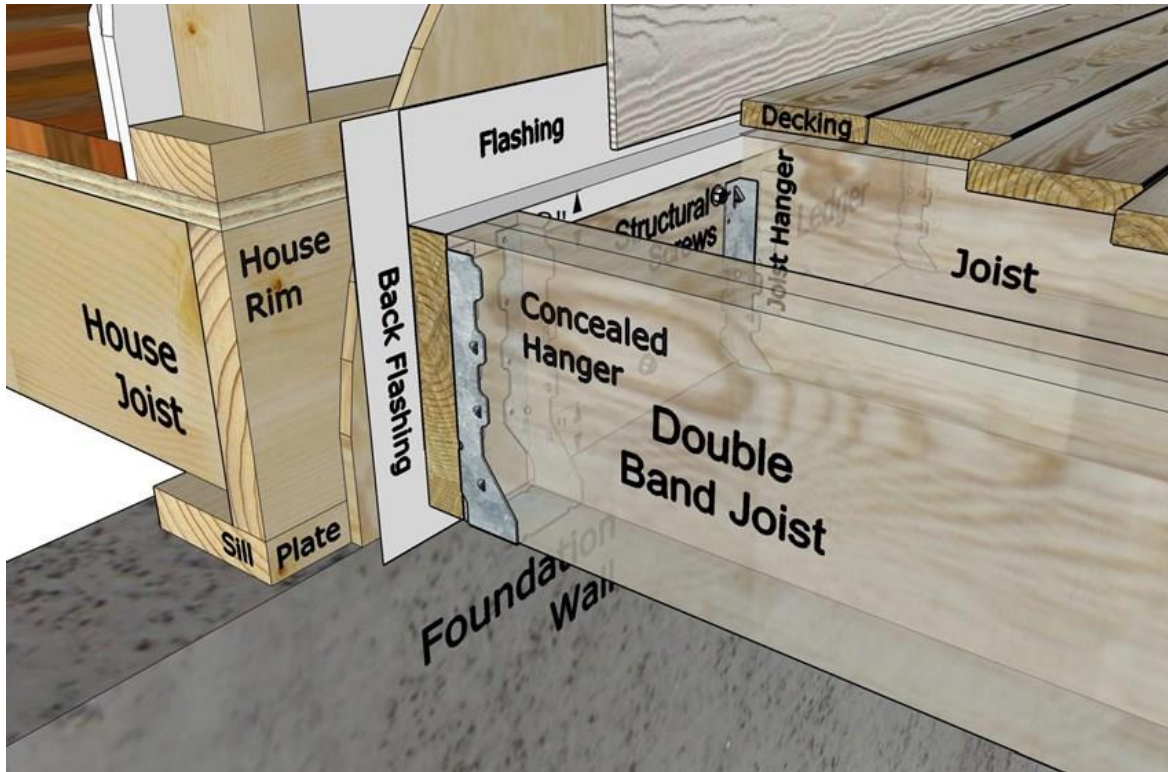
Required Brackets and devices

A lateral hold down device is required to be installed within 24 inches of each side of the deck. Each device is required to have the ability to with stand no less than 1,500 pounds of stress before failure. 4 – 750 pound lateral hold down devices may be substituted if placed at 24 inches from each edge and the reminder spread evenly.
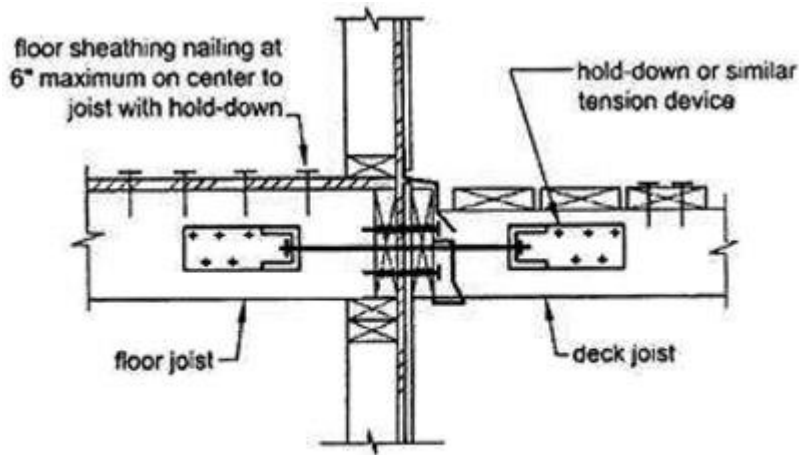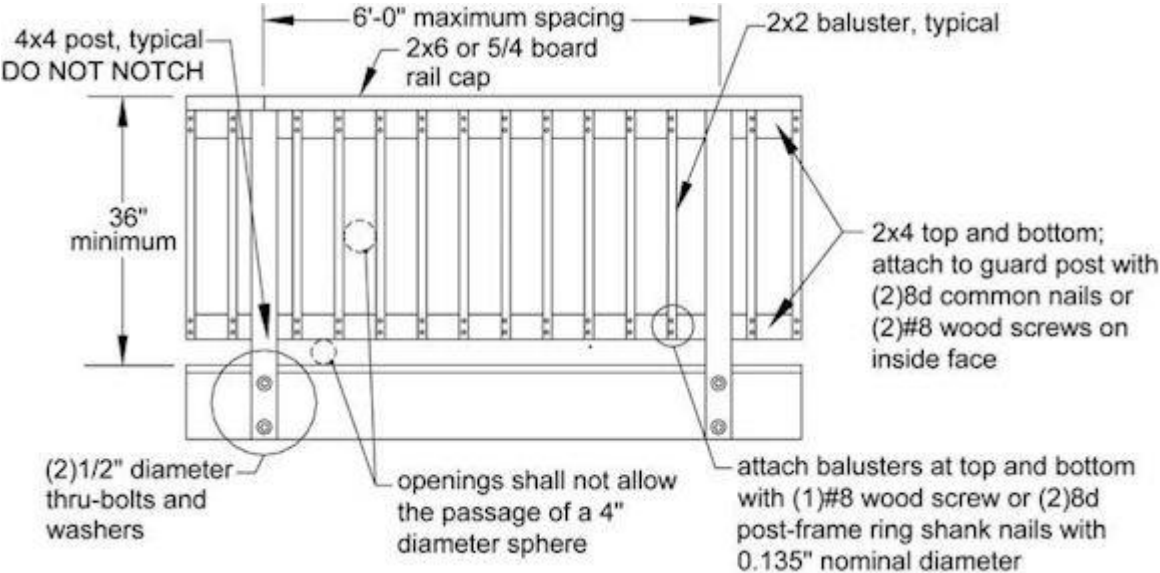

FIGURE R502.2.2
DECK ATTACHMENT FOR LATERAL LOADS

Decking Boards

Wooden decking boards are required to be a minimum of 5/4 in thickness. Plastic wood composite decking must conform to ASTM D7032. To determine that a product meets this standard check the manufactures data sheet or request a copy of the products accreditations from your material supplier.

Handrail and Guards

The top of the guard rail must be not less than 36 inches above the deck. The entire guard – handrail assembly must be built so that a 4-inch sphere will not pass though any opening. Please see the image of the railing assembly for clarification.

4x4 post, typical—
DO NOT NOTCH

6'-0" maximum spacing
2x6 or 5/4 board
rail cap

2x2 baluster, typical

36"
minimum

2x4 top and bottom;
attach to guard post with
(2)8d common nails or
(2)#8 wood screws on
inside face

(2)1/2" diameter
thru-bolts and
washers

openings shall not allow
the passage of a 4"
diameter sphere

attach balusters at top and bottom
with (1)#8 wood screw or (2)8d
post-frame ring shank nails with
0.135" nominal diameter

Please note that this packet does not contain all the requirements of the code. It is provided as a reference material for your convenience and to help with basic deck construction and allow you to determine the size of the structural members needed. If you need more information, please contact the United City of Yorkville Building Department

TABLE R507.6 DECK BEAM SPAN LENGTHS[a, b] (ft. - in.)

SPECIES[c]	SIZE[d]	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern pine	2 – 2 × 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
	2 – 2 × 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
	2 – 2 × 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0
	2 – 2 × 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0
	3 – 2 × 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3 – 2 × 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
	3 – 2 × 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6
	3 – 2 × 12	15-3	13-3	11-10	10-9	10-0	9-4	8-10
Douglas fir-larch[e], hem-fir[e], spruce-pine-fir[e], redwood, western cedars, ponderosa pine[f], red pine[f]	3 × 6 or 2 – 2 x 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3 × 8 or 2 – 2 × 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 × 10 or 2 – 2 × 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3 × 12 or 2 – 2 × 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4 × 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 × 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 × 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 × 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3 – 2 × 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3 – 2 × 8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3 – 2 × 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3 – 2 × 12	13-11	12-1	10-9	9-10	9-1	8-6	8-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound =

0.454 kg.

a. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at <u>main</u> span, L/Δ = 180 at cantilever with a 220-pound point load applied at the end.

b. Beams supporting deck joists from one side only.

TABLE R507.5 DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. - in.)

SPECIES[a]	SIZE	SPACING OF DECK JOISTS WITH NO CANTILEVER[b, f] (inches)			SPACING OF DECK JOISTS WITH CANTILEVERS[c] (inches)		
		12	16	24	12	16	24
Southern pine	2 × 6	9-11	9-0	7-7	6-8	6-8	6-8
	2 × 8	13-1	11-10	9-8	10-1	10-1	9-8
	2 ×10	16-2	14-0	11-5	14-6	14-0	11-5
	2 ×12	18-0	16-6	13-6	18-0	16-6	13-6
Douglas fir-larch[d], hem-fir[d] spruce-pine-fir[d]	2 × 6	9-6	8-8	7-2	6-3	6-3	6-3
	2 × 8	12-6	11-1	9-1	9-5	9-5	9-1
	2 × 10	15-8	13-7	11-1	13-7	13-7	11-1
	2 × 12	18-0	15-9	12-10	18-0	15-9	12-10
Redwood, western cedars, ponderosa pine[e], red pine[e]	2 × 6	8-10	8-0	7-0	5-7	5-7	5-7
	2 × 8	11-8	10-7	8-8	8-6	8-6	8-6
	2 × 10	14-11	13-0	10-7	12-3	12-3	10-7
	2 × 12	17-5	15-1	12-4	16-5	15-1	12-4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.