LARIMER COUNTY | COMMUNITY DEVELOPMENT

P.O. Box 1190, Fort Collins, Colorado 80522-1190, Planning (970) 498-7683, Building (970) 498-7700, Larimer.org

DECKS

Residential Deck Information

When is a Building Permit Required?

A permit is required if EITHER of the following is true:

- Deck is greater than 30 inches above grade
- Deck serves as the main entry/exit to a structure

If NEITHER of these are true, no permit is required. If ONLY electrical work is being done related to the deck, a miscellaneous county electrical permit is required. Electrical work must comply with 2020 National Electrical Code requirements.

Note: Decks must meet setback, floodplain and other requirements of the Larimer County Land Use Code, whether or not a permit is required. Please call the Planner on Call for more information at (970) 498-7679.

What Must be Submitted with a Building Permit Application?

- Residential Building Permit Application form.
- Two (2) full sets of plans drawn to scale (for example, 1/8", 3/16" or 1/4" = 1'), including plan view, cross sections, and elevations, showing all structural elements including footings, posts, beams, joists, ledger and connections.
- Four (4) copies of plot plans drawn to scale (see plot plan handout).

Graphic from Colorado Chapter of the International Code Council

Deck Details:

All lumber must be treated or naturally decay-resistant.

Piers or pads are required to support a deck. If attached to the structure, footings must be minimum 30" below grade. Foundation plan must be stamped by a Colorado Registered Engineer if location or design warrants.

For attached decks: If deck surface is ≥ 10' above surrounding grade at any point it must be x-braced.

For detached decks: If deck surface is ≥ 5' above surrounding grade at any point it must be x-braced.

If deck exceeds 30" above grade, a guardrail is required, 36" in height minimum, with intermediate railings spaced such that a 4" sphere cannot fit through, including between bottom rail and deck.

If installing stairs, stair rise must be a minimum of 4" and a maximum of 7 ¾". Tread run must be a minimum of 10" with ¾" to 1 ¼" nosing. Elimination of nosing requires an 11" minimum run. Variation of rise or run over the entire stairs shall not exceed $^{3}/_{8}$". Openings between open risers shall not allow exceed 4."

If more than three risers are installed, a continuous, graspable stair handrail is required, 34" to 38" above the tread nosing, with ends returned to posts at top and bottom, with maximum 4 $^{3}/_{8}$" spacing between rails.

See attached pages for deck details and allowed spans.

Last Update 10/20/2020

DECK BEAM SPAM

(Based on 45 psf Ground Snow Load & 10 psf Dead Load for elevations below 6000')

JOIST SPAN	6	7	8	9	10	11	12	13	14	15
4'	2-2x6's	2-2x6's	2-2x6's	2-2x8's	2-2x8's	2-2x8's	2-2x10's	2x2x10's	2x2x10's	2-2x12's
5'	2-2x6's	2-2x6's	2-2x8's	2-2x8's	2-2x8's	2-2x10's	2-2x10's	2x2x12's	2x2x12's	3-2x12's
6'	2-2x6's	2-2x6's	2-2x8's	2-2x8's	2-2x10's	2x2x10's	2x2x12's	2-2x12's	3-2x12's	3-2x12's
7'	2-2x6's	2-2x8's	2-2x8's	2x2x10's	2x2x10's	2x2x12's	2x2x12's	3-2x12's	3-2x12's	3-2x12's
8'	2-2x6's	2-2x8's	2-2x8's	2x2x10's	2x2x12's	2-2x12's	3-2x12's	3-2x12's	3-2x12's	
9'	2-2x6's	2-2x8's	2-2x10's	2x2x10's	2x2x12's	3-2x12's	3-2x12's	3-2x12's		
10'	2-2x8's	2-2x8's	2x2x10's	2-2x12's	2-2x12's	3-2x12's	3-2x12's			
11'	2-2x8's	2-2x10's	2x2x10's	2-2x12's	3-2x12's	3-2x12's	3-2x12's			
12'	2-2x8's	2-2x10's	2x2x10's	2-2x12's	3-2x12's	3-2x12's				
13'	2-2x8's	2-2x10's	2x2x12's	2-2x12's	3-2x12's	3-2x12's				
14'	2-2x8's	2x2x10's	2x2x12's	3-2x12's	3-2x12's					
15'	2-2x10's	2x2x10's	2-2x12's	3-2x12's	3-2x12's					
16'	2-2x10's	2x2x10's	2-2x12's	3-2x12's	3-2x12's					

This area to be sized by Design Professional

This is for beams with joists on one side – NOT interior beams

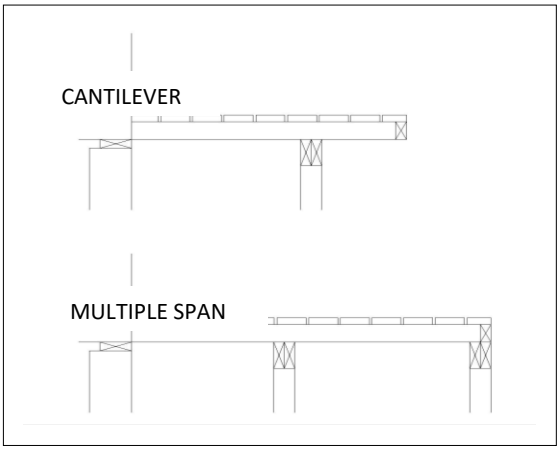
JOIST SPAN TABLE AND ON-CENTER SPACING 45psf Ground Snow Load					
SPACED AT 12 INCHES		SPACED AT 16 INCHES		SPACED AT 24 INCHES	
FEET	MIN. SIZE	FEET	MIN. SIZE	FEET	MIN. SIZE
6	**2"x 6"**	6	**2"x 6"**	6	**2"x 6"**
7	**2"x 6"**	7	**2"x 6"**	7	**2"x 8"**
8	**2"x 6"**	8	**2"x 8"**	8	**2"x 8"**
9	**2"x 8"**	9	**2"x 8"**	9	**2"x 10"**
10	**2"x 8"**	10	**2"x 8"**	10	**2"x 10"**
11	**2"x 8"**	11	**2"x 10"**	11	**2"x 12"**
12	**2"x 10"**	12	**2"x 10"**	12	**2"x 12"**
13	**2"x 10"**	13	**2"x 10"**	13	**
14	**2"x 10"**	14	**2"x 12"**	14	**
15	**2"x 12"**	15	**2"x 12"**	15	**
16	**2"x 12"**	16	**	16	**

NOTES:

- Neither table addresses multiple spans
- All calculations based on Hem-Fir #2. Allowable spans may be less or greater depending on type of wood used.
- Firewood storage and/or hot tubs are not permitted using these tables
- All beams must be fully supported
- Lumber must be protected from exterior elements
- Cantilevers not exceeding 1 foot can be included in overall joist span

**To be sized by Design Professional

Larimer County Deck Handout **does not** apply to these deck designs. They must be designed by others to accepted engineering standards.



Last Update 10/20/2020

DECK BEAM SPAM

(Based on 70 psf Ground Snow Load & 10 psf Dead Load for elevations below 6001' to 8000')

JOIST SPAN	6	7	8	9	10	11	12	13	14	15
4'	2-2x6's	2-2x6's	2-2x8's	2-2x8's	2-2x8's	2-2x10's	2-2x10's	2x2x12's	2x2x12's	3-2x12's
5'	2-2x6's	2-2x6's	2-2x8's	2-2x8's	2-2x10's	2-2x10's	2-2x12's	2x2x12's	3x2x12's	3-2x12's
6'	2-2x6's	2-2x8's	2-2x8's	2-2x10's	2-2x10's	2x2x12's	3x2x12's	3-2x12's	3-2x12's	
7'	2-2x6's	2-2x8's	2-2x10's	2x2x10's	2x2x12's	2x2x12's	3x2x12's	3-2x12's		
8'	2-2x8's	2-2x8's	2-2x10's	2x2x12's	2x2x12's	3-2x12's	3-2x12's			
9'	2-2x8's	2-2x10's	2-2x10's	2x2x12's	3x2x12's	3-2x12's				
10'	2-2x8's	2-2x10's	2x2x12's	2-2x12's	3-2x12's	3-2x12's				
11'	2-2x8's	2-2x10's	2x2x12's	3-2x12's	3-2x12's					
12'	2-2x10's	2-2x10's	2x2x12's	3-2x12's	3-2x12's					
13'	2-2x10's	2-2x12's	2x2x12's	3-2x12's						
14'	2-2x10's	2x2x12's	3x2x12's	3-2x12's						
15'	2-2x10's	2x2x12's	3-2x12's	3-2x12's						
16'	2-2x10's	2x2x12's	3-2x12's							

This area to be sized by Design Professional

This chart is for beams with joists on one side – NOT for interior beams

JOIST SPAN TABLE AND ON-CENTER SPACING 70 psf Ground Snow Load					
SPACED AT 12 INCHES		SPACED AT 16 INCHES		SPACED AT 24 INCHES	
FEET	MIN. SIZE	FEET	MIN. SIZE	FEET	MIN. SIZE
6	**2"x 6"**	6	**2"x 6"**	6	**2"x 6"**
7	**2"x 6"**	7	**2"x 6"**	7	**2"x 8"**
8	**2"x 8"**	8	**2"x 8"**	8	**2"x 10"**
9	**2"x 8"**	9	**2"x 8"**	9	**2"x 10"**
10	**2"x 8"**	10	**2"x 10"**	10	**2"x 12"**
11	**2"x 10"**	11	**2"x 10"**	11	**2"x 12"**
12	**2"x 10"**	12	**2"x 12"**	12	**
13	**2"x 10"**	13	**2"x 12"**	13	**
14	**2"x 12"**	14	**	14	**
15	**2"x 12"**	15	**	15	**
16	**	16	**	16	**

NOTES:

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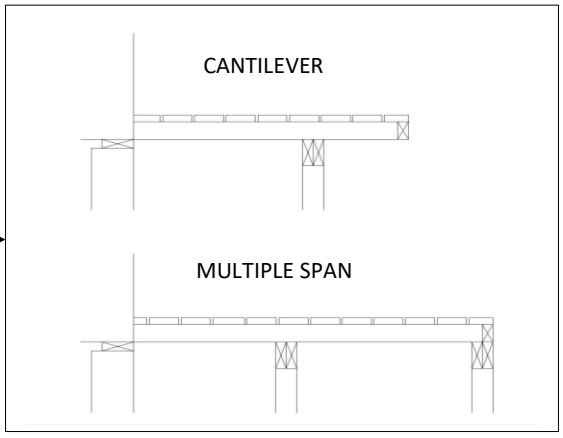
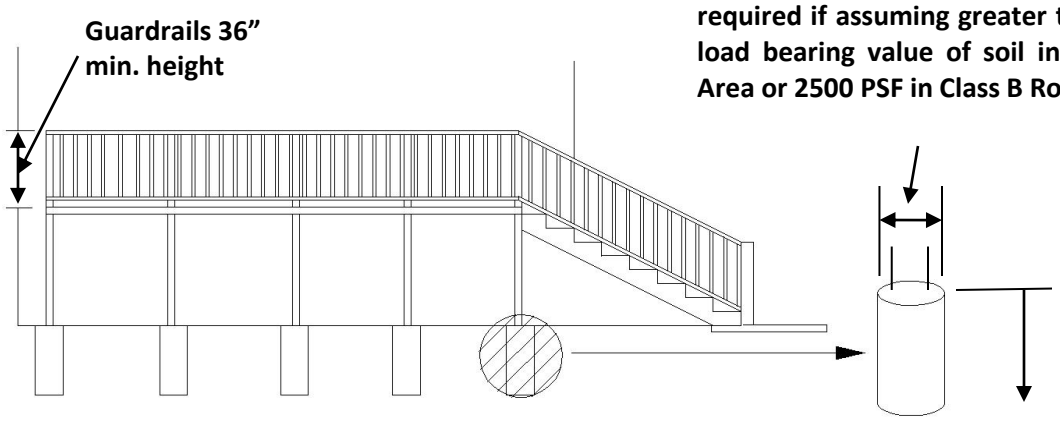


Last Update 10/20/2020

ELEVATION DETAIL



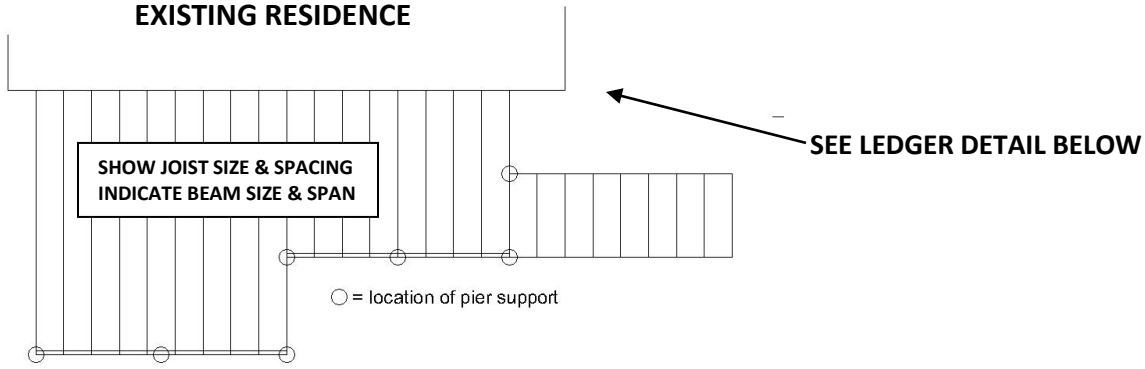
See attached table for prescriptive footing size. Justification of design professional required if assuming greater than 1500 PSF load bearing value of soil in Class C Roof Area or 2500 PSF in Class B Roof Area

Frost depth required is 30" min. below grade unless solid rock is encountered.

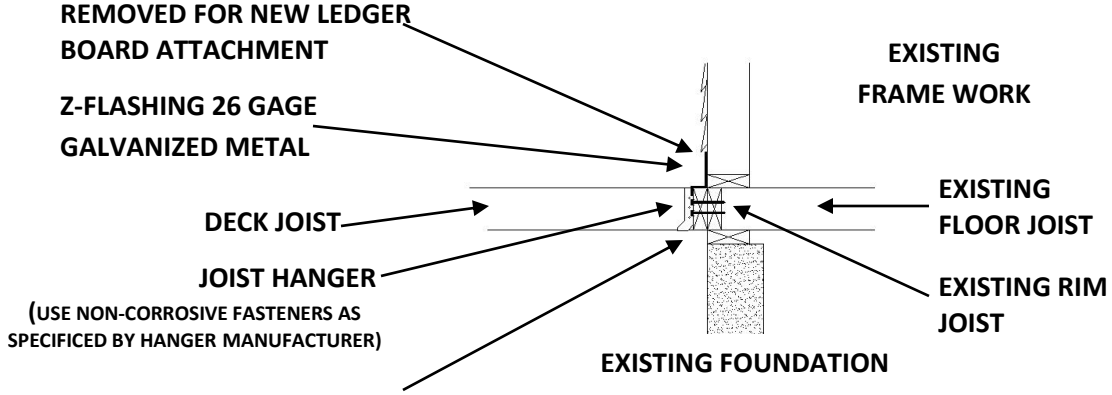
If rock is encountered within 30", a #4 rebar 12" long shall be doweled 6" into rock and epoxied (or per engineered plans).

Posts must be treated if within 8" of grade.

PLAN VIEW



LEDGER CONNECTION DETAIL



1/2" LAG BOLTS OR LAG SCREWS AT 16" ON CENTER OR 5/16" LEDGERLOKS PER MANUFACTURER'S SPECIFICATIONS (WHICH MUST FULLY PENETRATE THROUGH THE RIM BOARD). REFER TO ATTACHED TABLE FOR QUANTITY.

Last Update 10/20/2020

LEDGER ATTACHMENT

½ " Diameter Lag Screws or LedgerLOKs

	DECK JOIST SPAN					
GROUND SNOW LOAD	**6' & Less**	**6'1" – 8'**	**8'1" – 10 '**	**10'1" – 12'**	**12'1"-14'**	**14'1"- 16'**
45 PSF	2	2	3	3	4	4
70 PSF	2	3	3	4	4	5

DECK LATERAL ATTACHMENT DETAIL PER 2018 IRC FIGURE R507.9.2(2)

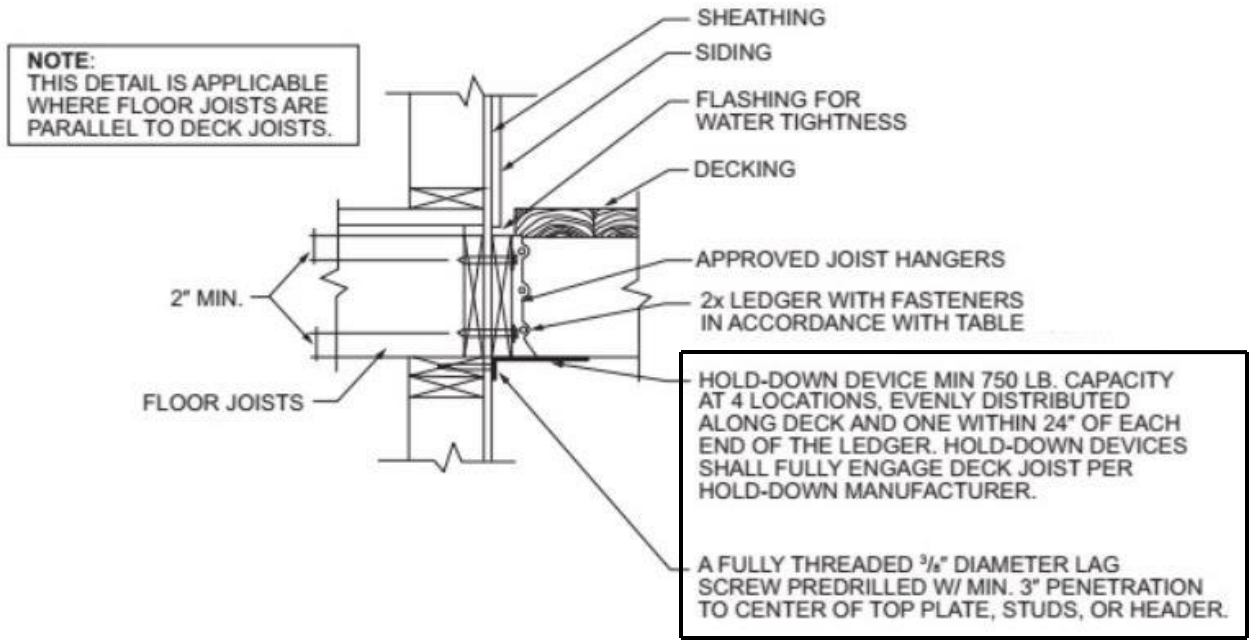


TABLE R507.3.1
MINIMUM FOOTING SIZE FOR DECKS

LIVE OR GROUND SNOW LOAD[b] (psf)	TRIBUTARY AREA (sq. ft.)	LOAD BEARING VALUE OF SOILS [a, c, d] (psf)											
		1500e			2000e			2500e			≥ 3000e		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)
40	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	14	16	6	12	14	6	12	14	6	12	14	6
	60	17	19	6	15	17	6	13	15	6	12	14	6
	80	20	22	7	17	19	6	15	17	6	14	16	6
	100	22	25	8	19	21	6	17	19	6	15	17	6
	120	24	27	9	21	23	7	19	21	6	17	19	6
	140	26	29	10	22	25	8	20	23	7	18	21	6
	160	28	31	11	24	27	9	21	24	8	20	22	7
50	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	15	17	6	13	15	6	12	14	6	12	14	6
	60	19	21	6	16	18	6	14	16	6	13	15	6
	80	21	24	8	19	21	6	17	19	6	15	17	6
	100	24	27	9	21	23	7	19	21	6	17	19	6
	120	26	30	10	23	26	8	20	23	7	19	21	6
	140	28	32	11	25	28	9	22	25	8	20	23	7
	160	30	34	12	26	30	10	24	27	9	21	24	8
60	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	16	19	6	14	16	6	13	14	6	12	14	6
	60	20	23	7	17	20	6	16	18	6	14	16	6
	80	23	26	9	20	23	7	18	20	6	16	19	6
	100	26	29	10	22	25	8	20	23	7	18	21	6
	120	28	32	11	25	28	9	22	25	8	20	23	7
	140	31	35	12	27	30	10	24	27	9	22	24	8
	160	33	37	13	28	32	11	25	29	10	23	26	9
70	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	18	20	6	15	17	6	14	15	6	12	14	6
	60	21	24	8	19	21	6	17	19	6	15	17	6
	80	25	28	9	21	24	8	19	22	7	18	20	6
	100	28	31	11	24	27	9	21	24	8	20	22	7
	120	30	34	12	26	30	10	24	27	9	21	24	8
	140	33	37	13	28	32	11	25	29	10	23	26	9
	160	35	40	15	30	34	12	27	31	11	25	28	9

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m^2, 1 pound per square foot = 0.0479 kPa.

a. Interpolation permitted, extrapolation not permitted.

b. Based on highest load case: Dead + Live or Dead + Snow.

c. Assumes minimum square footing to be 12 inches x 12 inches x 6 inches for 6 x 6 post.

d. If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides.

e. Area, in square feet, of deck surface supported by post and footings.