



Residential Deck Handout

This information only outlines general code requirements related to building a residential deck. For specific code requirements, please contact a design professional or the Hastings Building Department at 651-480-2342.

A building permit is required to construct a deck. To obtain a permit the following items must be submitted:

Requirements

- 1) A completed and signed building permit application form.
- 2) A copy of the Certificate of Survey or site plan drawn to scale, showing property lines, existing buildings and the proposed structure location with distances to the property lines.
- 3) Two copies of building plans. All structural must be sized and properly spaced to support all loads. The following may be used in designing your deck. If there are any overhead wires in the vicinity of your proposed deck, contact the state electrical inspector for required clearances. The following items must be included with the deck plans:
 - a. All dimensions drawn to scale
 - b. Size and depth of footings
 - c. One elevation showing deck height and guard design
 - d. Spacing of posts
 - e. Size of beams and headers
 - f. Size, direction, and spacing of joists
 - g. Size, direction, and type of decking
 - h. Type and size of materials used.
 - i. Stair location (if applicable)

Permit process

Your application will be reviewed for code compliance and setback requirements. Permit fees are posted on our website, <https://www.hastingsmn.gov/city-government/fees> You will be notified when the permit is ready to be picked up.

Before digging, call **Gopher State One Call at 811 or 651-454-0002** to locate utilities 48 hours in advance.

Required inspections

Please call 651-480-2342 a minimum of 24 hours in advance to schedule inspections. Inspections are scheduled Monday thru Friday, 9:00 am until 4:00 pm.

- 1) **Footing**
After holes are dug, loose dirt and water removed and prior to placing concrete.
- 2) **Framing**
If the bottom of the deck framing is less than 36 inches to grade, the framing needs to be inspected before installing the decking.
- 3) **Final**
Final building inspection after the work is completed.

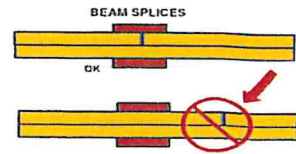
The Building Code used for construction is the 2020 Minnesota Residential Code with amendments Section R507 Exterior Decks

For more deck information not found in this handout go to: <https://codes.iccsafe.org/content/MNRC2020/chapter-5-floors>

General requirements

The bottom of the footing must be a minimum of 42" below undisturbed soil, measured either vertically or horizontally. Augured footings shall have smooth forms installed prior to the footing inspection.

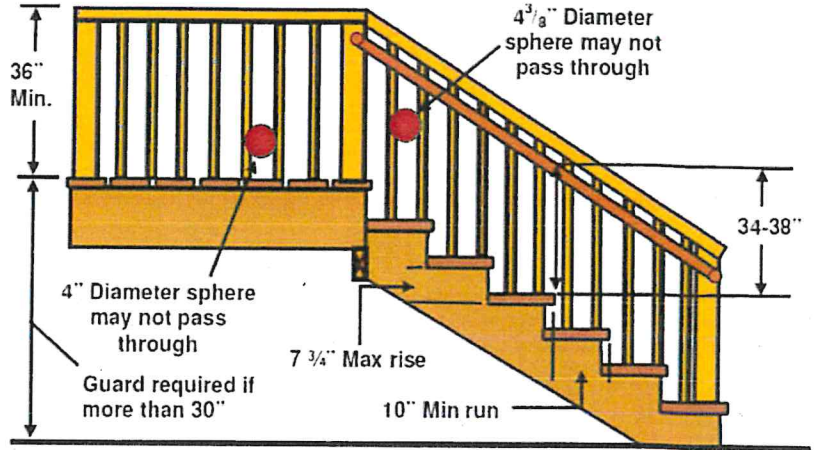
- Beam splices must be directly over posts, minimum of 1 1/2" bearing.
- Deck ledger boards must be secured and attached to the structure per table R507.9.1.3(1) and R507.9.1.3(2) within this handout



- Joist hangers are required wherever joists do not have at least 1 1/2" of bearing. (Exceptions: cantilevered ends.)

- Galvanized connectors are required for footing to post, post to beam, and beam to joist connections.

- Guards are required on all decks more than 30" above grade. Guards must be 36" minimum in height. Open guards must have intermediate rails or an ornamental pattern that a 4" sphere cannot pass through. Guards must be able to withstand 200 lbs. of applied pressure.

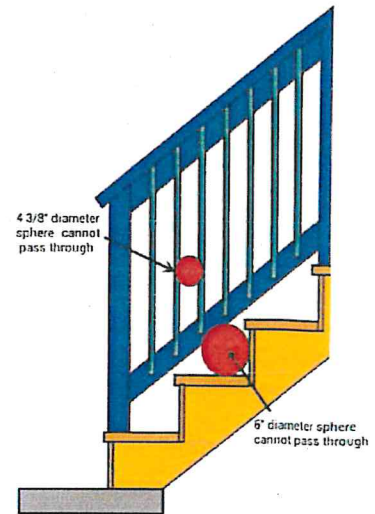


- Stairways must be 36" between guards for the full length of the stairway.

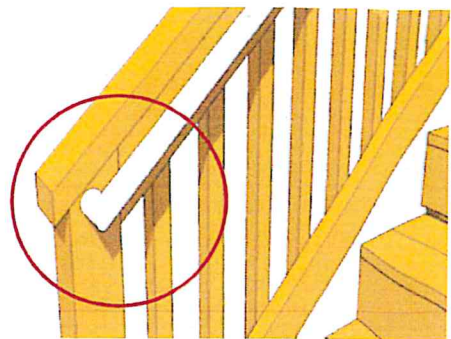
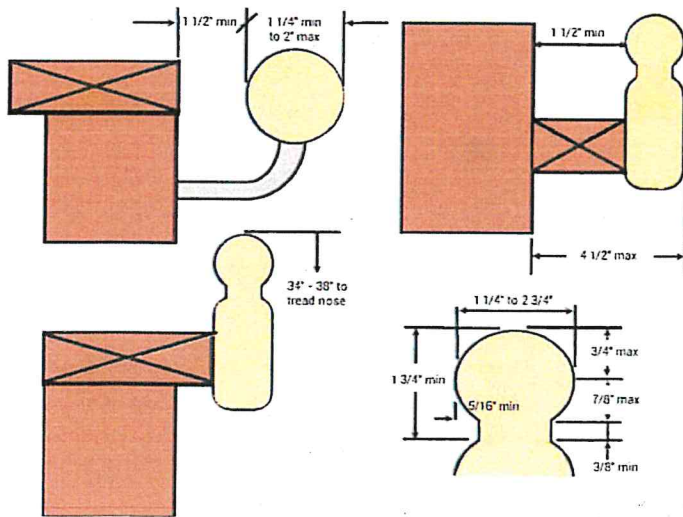
- The maximum rise is 7 3/4", the minimum run is 10". Treads, risers and nosing's shall be consistent within 3/8". Open risers on stairs with a total rise greater than 30" is not permitted to allow the passage of a 4" diameter sphere. A nosing not less than 3/4 inch or greater than 1 1/4" shall be provided on stairways. Spiral stairs are to comply with Section

R311.7.10.1

- Stairways require a guard not less than 34" in height from the nose of the treads. Open guards shall have intermediate rails or an ornamental pattern such that a sphere 4 3/8" in diameter cannot pass through. The triangular openings formed by the riser, tread and bottom rail of guards shall be such that a sphere 6" in diameter cannot pass through.

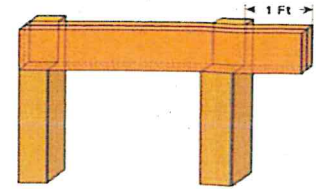


- Handrails are required on stairs with four or more risers.



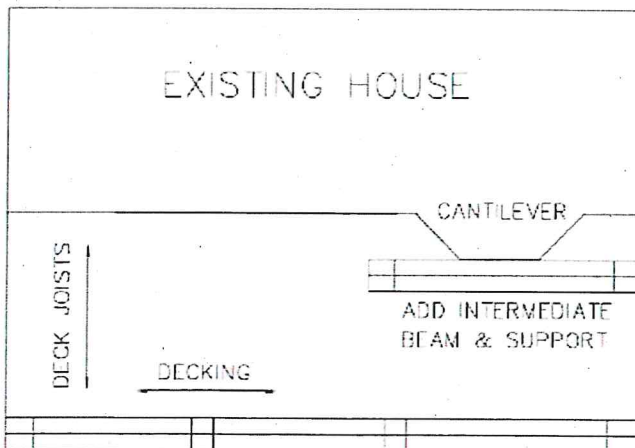
- Handrails must have a continuous graspable surface and be 34" to 38" above the tread nosing and run the full length of the stairs with ends returned. Handrails shall have a space of not less than 1 1/2" between the handrail and the wall or guard. The handrails shall be not less than 1 1/4" or more than 2" in diameter.

- Structural members of exterior decks must be cedar, redwood, treated wood or an approved composite material.
- Hangers, connectors and fasteners used in conjunction with ACQ treated lumber are required to be ACQ compatible.
- Special designs or engineering may be required for a 3-season porch or if spas/whirlpool tubs will be placed/located on decks.
- Revised plan review fees shall be incurred in the event an additional plan review becomes necessary due to revised building plans.
- Alternative footing designs, such as Diamond Pier footings, will be evaluated on an individual basis.
- 4x4" posts (when used for rails and guards) may only be notched a maximum of 7/8 of an inch. 6x6" posts (when used for rails and guards) may be notched up to 1/2 of the thickness of the post.
- Joists may only be cantilevered a maximum of 2 feet. Beams may only be cantilevered a maximum of 1 foot.
- Decks cannot bear on cantilevered floors. Additional framing will be required.



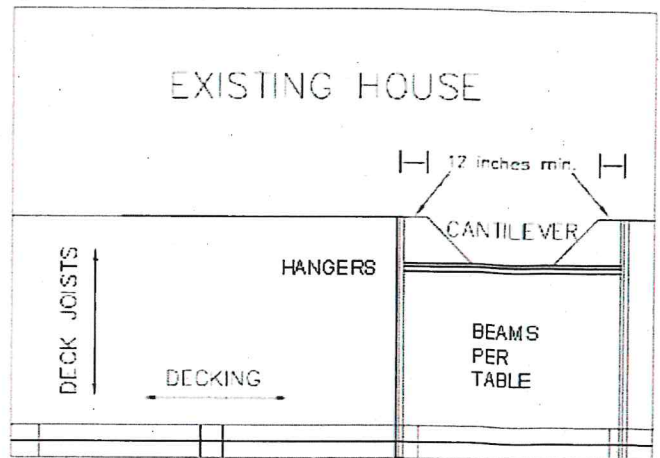
Many house designs have cantilevered (extensions) from the main structure and which typically contain patio doors for future deck additions. The reinforcement selected will be based on the type of floor framing member presently in the house. We have diagrammed two possible solutions for providing such reinforcement.

EXAMPLE 1



Example 1
Add an intermediate beam, supports and footings. Size beam and footings.

EXAMPLE 2



Example 2
Size beams per handout. Provide adequate hangers from all connections. Design center beam per chart. Also lag bolt to cantilever ledger board.

DECK LEDGER REQUIREMENTS

R507.9.1.1 Ledger details Deck ledgers shall be a minimum of 2-inch by 8-inch nominal pressure-preservative-treated Southern pine, incised pressure-preservative-treated Hem-Fir, or approved, naturally durable, No. 2 grade or better lumber. Deck ledgers shall not support concentrated loads from beams or girders. Deck ledgers shall not be supported on stone or masonry veneer. Deck ledgers shall not be smaller than the depth of the deck joists.

R507.9.1.2 Band joist details. Band joists supporting a ledger shall be a minimum of 2-inch nominal solid-sawn spruce-pine-fir or better lumber or a minimum 1-inch by 9-1/2 inch dimensional Douglas fir or better, laminated veneer lumber. Band joists shall fully bear on the primary structure capable of supporting all required loads.

NOTE: When installing deck ledgers to metal plate connected wood floor trusses consult SBCA Research Report SRR No. 1408-01 for required blocking.

<https://www.sbcindustry.com/system/files/sbca/research-report/node/924/srr140801deckledger.pdf>

TABLE R507.9.1.3(1)
DECK LEDGER CONNECTION TO BAND JOIST^{a, b}
(Deck live load = 40 psf, deck dead load = 10 psf, snow load ≤ 40 psf)

CONNECTION DETAILS	JOIST SPAN						
	6' and less	6'1" to 8'	8'1" to 10'	10'1" to 12'	12'1" to 14'	14'1" to 16'	16'1" to 18'
	On-center spacing of fasteners						
1/2-inch diameter lag screw with 1/2-inch maximum sheathing ^{c, d}	30	23	18	15	13	11	10
1/2-inch diameter bolt with 1/2-inch maximum sheathing ^d	36	36	34	29	24	21	19
1/2-inch diameter bolt with 1-inch maximum sheathing ^e	36	36	29	24	21	18	16

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

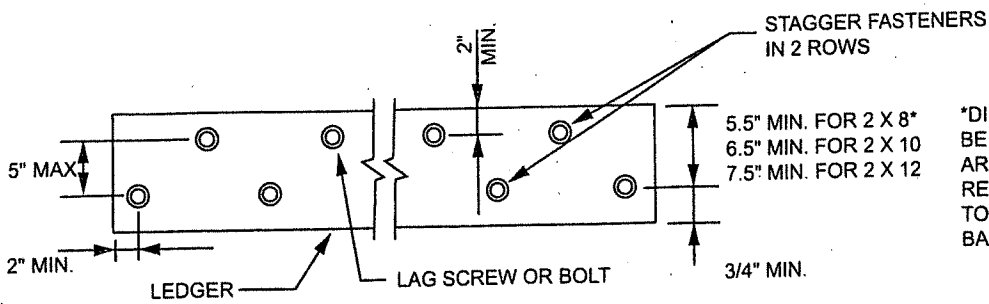
- Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.
- Snow load shall not be assumed to act concurrently with live load.
- The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- Sheathing shall be wood structural panel or solid sawn lumber.
- Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to 1/2-inch thickness of stacked washers shall be permitted to substitute for up to 1/2 inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

TABLE R507.9.1.3(2)
PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS

	MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS			
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Ledger ^a	2 inches ^d	3/4 inch	2 inches ^b	1 5/8 inches ^b
Band Joist ^c	3/4 inch	2 inches	2 inches ^b	1 5/8 inches ^b

For SI: 1 inch = 25.4 mm.

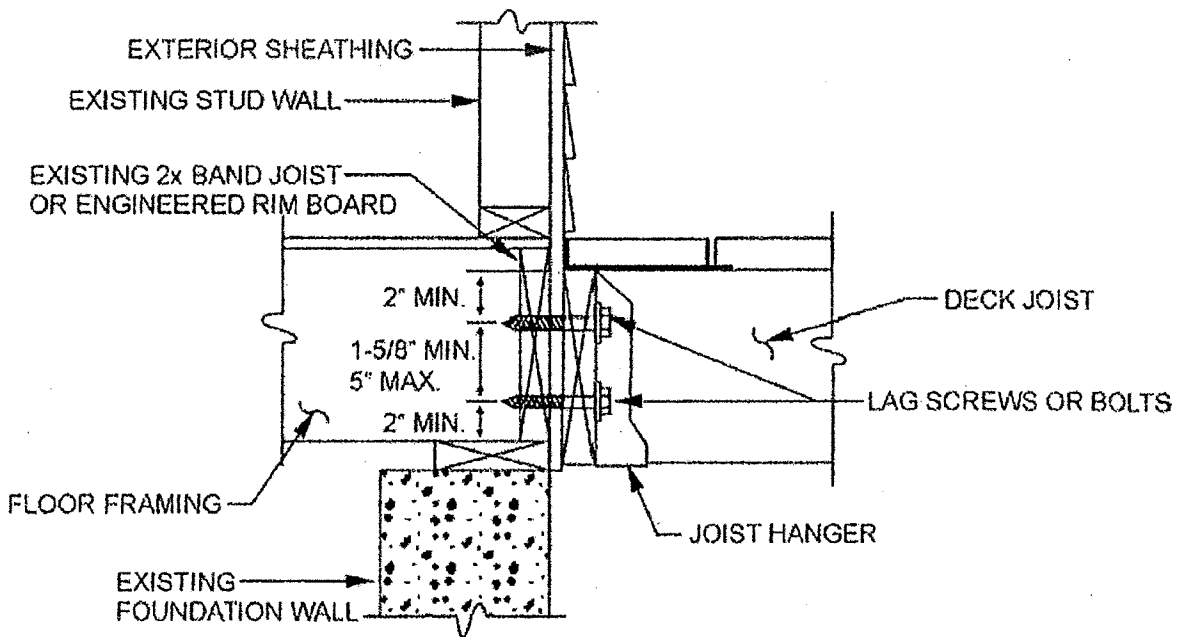
- Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.9.1.3(1).
- Maximum 5 inches.
- For engineered rim joists, the manufacturer's recommendations shall govern.
- The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure R507.9.1.3(1).



*DISTANCE SHALL BE PERMITTED TO BE REDUCED TO 4.5" IF LAG SCREWS ARE USED OR BOLT SPACING IS REDUCED TO THAT OF LAG SCREWS TO ATTACH 2 X 8 LEDGERS TO 2 X 8 BAND JOISTS.

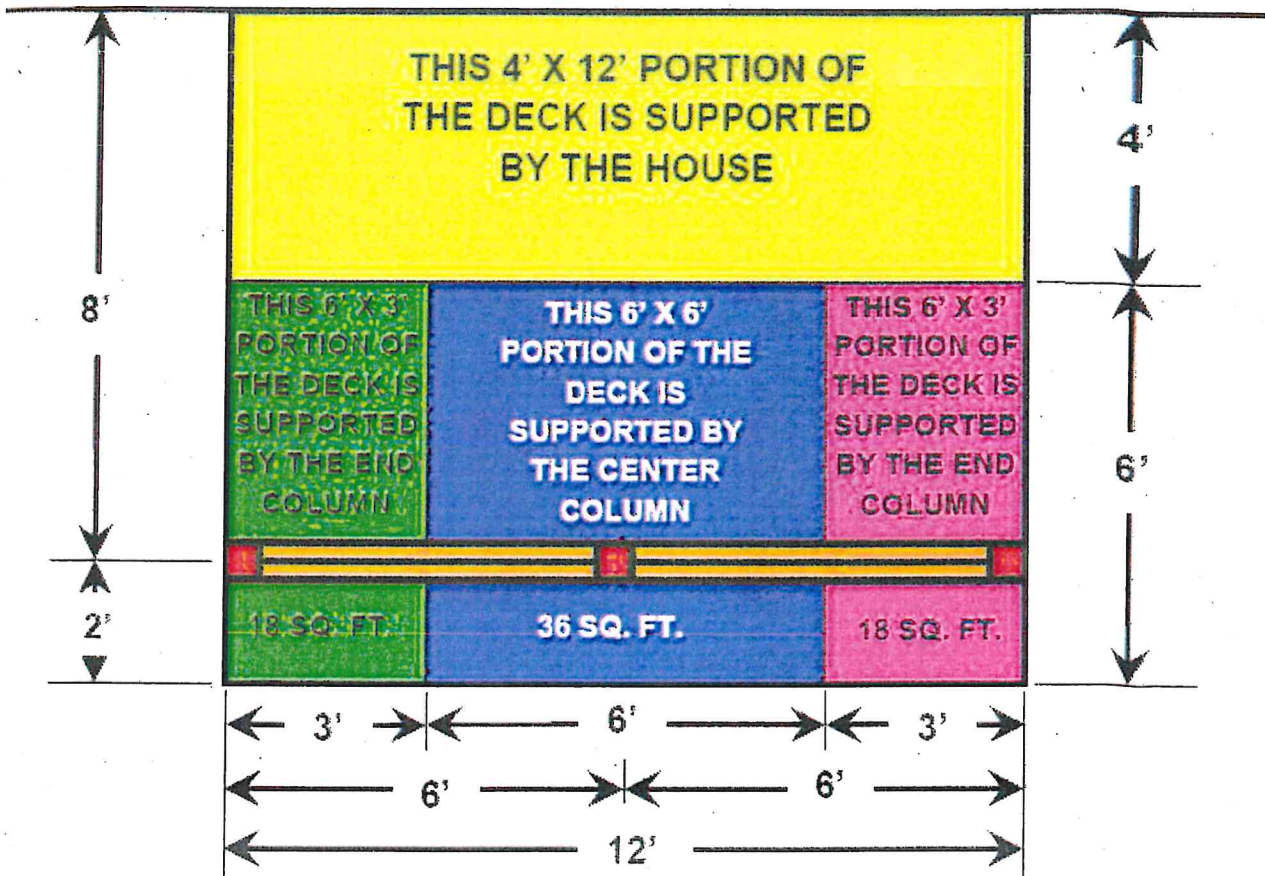
For SI: 1 inch = 25.4 mm.

FIGURE R507.9.1.3(1)
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS



Fasteners used to attach a ledger other than the prescribed 1/2" lag screws or 1/2" thru bolts much be tested and listed and installed to the manufacturer's written instructions.

The illustration below is an example of 10' x 12' deck where the deck joist cantilever past the beam a maximum of 2'. Use the dimensions for your project to determine the minimum requirements for footings and framing elements.



Joist sizing

The joist length is 10'. Table R507.6 list the allowable spans for various species of lumber. The most common lumber used is treated Southern pine. We will figure the joist spacing as 16" on center. In this case a 2 x 8 will work. We will assume that the decking material is wood (either treated or cedar) 1-1/4" thick. Looking at Table R507.7 we see that the decking run perpendicular to the joists at 16" on center works. If the decking is run at an angle to the joist the joist spacing would have to be 12" on center.

Beam sizing and post spacing

Now that we have determined what we need for joist size and spacing let us figure the required size beam and post spacing by looking at the deck plan shown above by looking at figure R507.5 and Table R507.5 Again the wood species is treated Southern pine. Our drawing shows a 10' joist span and posts spaced at 6'. Looking at table R507.5 we look down the 10' joist span column to find a number that is greater than or equal to 6'. In this case we see that 1- 2"x12" will work or 2- 2"x8" will also work.

Note: If you are doing a flush beam instead of a dropped beam the beam depth needs to be at a minimum the same depth as the joists.

The reason that a 2x6 joist does not work for the span calculations on the previous page does not work is that a 2x6 cannot cantilever more than 1'-4" and the drawing shows a 2' cantilever.

If a joist span is close to being maxed out based on spacing you may not be happy with the deck performance. Example. "The deck feels bouncy" Consider changing the joist spacing. Ex. 16" on center to 12" on center. Or consider changing the joist size. Ex. 2"x8" to 2"x10"

TABLE R507.6
DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. - in.)

SPECIES ^a	SIZE	ALLOWABLE JOIST SPAN ^b			MAXIMUM CANTILEVER ^{c, f}		
		SPACING OF DECK JOISTS (inches)			SPACING OF DECK JOISTS WITH CANTILEVERS ^e (inches)		
		12	16	24	12	16	24
Southern pine	2 × 6	9-11	9-0	7-7	1-3	1-4	1-6
	2 × 8	13-1	11-10	9-8	2-1	2-3	2-5
	2 × 10	16-2	14-0	11-5	3-4	3-6	2-10
	2 × 12	18-0	16-6	13-6	4-6	4-2	3-4
Douglas fir-larch ^d , hem-fir ^d , spruce-pine-fir ^d ,	2 × 6	9-6	8-8	7-2	1-2	1-3	1-5
	2 × 8	12-6	11-1	9-1	1-11	2-1	2-3
	2 × 10	15-8	13-7	11-1	3-1	3-5	2-9
	2 × 12	18-0	15-9	12-10	4-6	3-11	3-3
Redwood, western cedars, ponderosa pine ^e , red pine ^e	2 × 6	8-10	8-0	7-0	1-0	1-1	1-2
	2 × 8	11-8	10-7	8-8	1-8	1-10	2-0
	2 × 10	14-11	13-0	10-7	2-8	2-10	2-8
	2 × 12	17-5	15-1	12-4	3-10	3-9	3-1

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. No. 2 grade with wet service factor.
- b. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360.
- c. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220-pound point load applied to end.
- d. Includes incising factor.
- e. Northern species with no incising factor.
- f. Cantilevered spans not exceeding the nominal depth of the joist are permitted.

TABLE R507.7
MAXIMUM JOIST SPACING FOR DECKING

DECKING MATERIAL TYPE AND NOMINAL SIZE	MAXIMUM ON-CENTER JOIST SPACING	
	Decking perpendicular to joist	Decking diagonal to joist ^a
1 1/4-inch-thick wood	16 inches	12 inches
2-inch-thick wood	24 inches	16 inches
Plastic composite	In accordance with Section R507.2	In accordance with Section R507.2

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 degree = 0.01745 rad.

- a. Maximum angle of 45 degrees from perpendicular for wood deck boards.

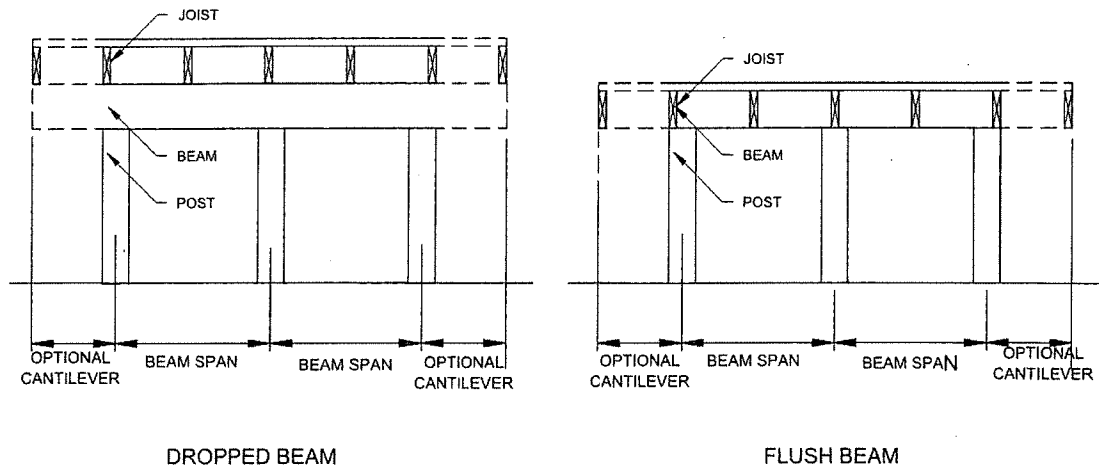


FIGURE R507.5
TYPICAL DECK JOIST SPANS

TABLE R507.5
DECK BEAM SPAN LENGTHS^{a, b, g} (feet - inches)

SPECIES ^c	SIZE ^d	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern pine	1 - 2 x 6	4-11	4-0	3-7	3-3	3-0	2-10	2-8
	1 - 2 x 8	5-11	5-1	4-7	4-2	2-10	3-7	3-5
	1 - 2 x 10	7-0	6-0	5-5	4-11	4-7	4-3	4-0
	1 - 2 x 12	8-3	7-1	6-4	5-10	5-5	5-0	4-9
	2 - 2 x 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
	2 - 2 x 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
	2 - 2 x 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0
	2 - 2 x 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0
	3 - 2 x 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3 - 2 x 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
	3 - 2 x 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6
	3 - 2 x 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 x 6 or 2 - 2 x 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3 x 8 or 2 - 2 x 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 x 10 or 2 - 2 x 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3 x 12 or 2 - 2 x 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4 x 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 x 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 x 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 x 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3 - 2 x 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3 - 2 x 8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3 - 2 x 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3 - 2 x 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, $L/\Delta = 360$ at main span, $L/\Delta = 180$ at cantilever with a 220-pound point load applied at the end.

b. Beams supporting deck joists from one side only.

c. No. 2 grade, wet service factor.

d. Beam depth shall be greater than or equal to depth of joists with a flush beam condition.

e. Includes incising factor.

f. Northern species. Incising factor not included.

g. Beam cantilevers are limited to the adjacent beam's span divided by 4.

Determining footing size

The footings are sized by determining the surface area of the deck that each post is supporting, this is referred to as the *Tributary Area*. The type of soils in your area and loading on the deck will also play a part in the footing sizing.

We will use our sample drawing for this again.

The yellow colored section we will call area 1

The green colored section we will call area 2

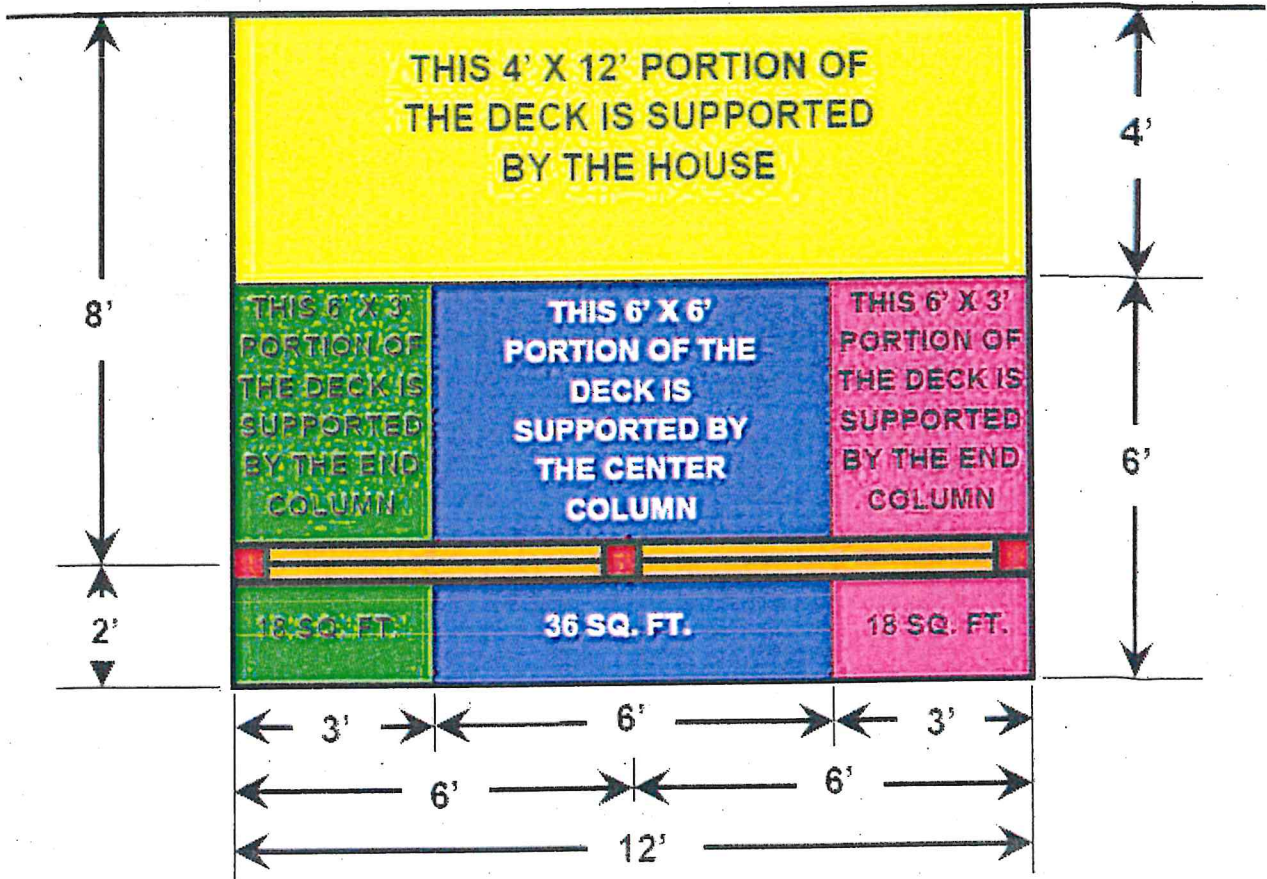
The blue colored section we will call area 3

The pink colored section we will call area 4

Start by dividing the joist span from the house to your beam in half. Since area 1 is fully supported by the house no calculation is needed. Areas 2,3, and 4 will be 4' plus the 2' cantilever or 6'

Let's divide the spacing between the posts by 2. That gives us 3' in area 2, 6' in area 3, and 3' in area 4.

Area 2 $3 \times 6 = 18$ Area 3 $6 \times 6 = 36$ Area 4 $3 \times 6 = 18$



We can now look at Table R507.3.1 to determine the required footing size

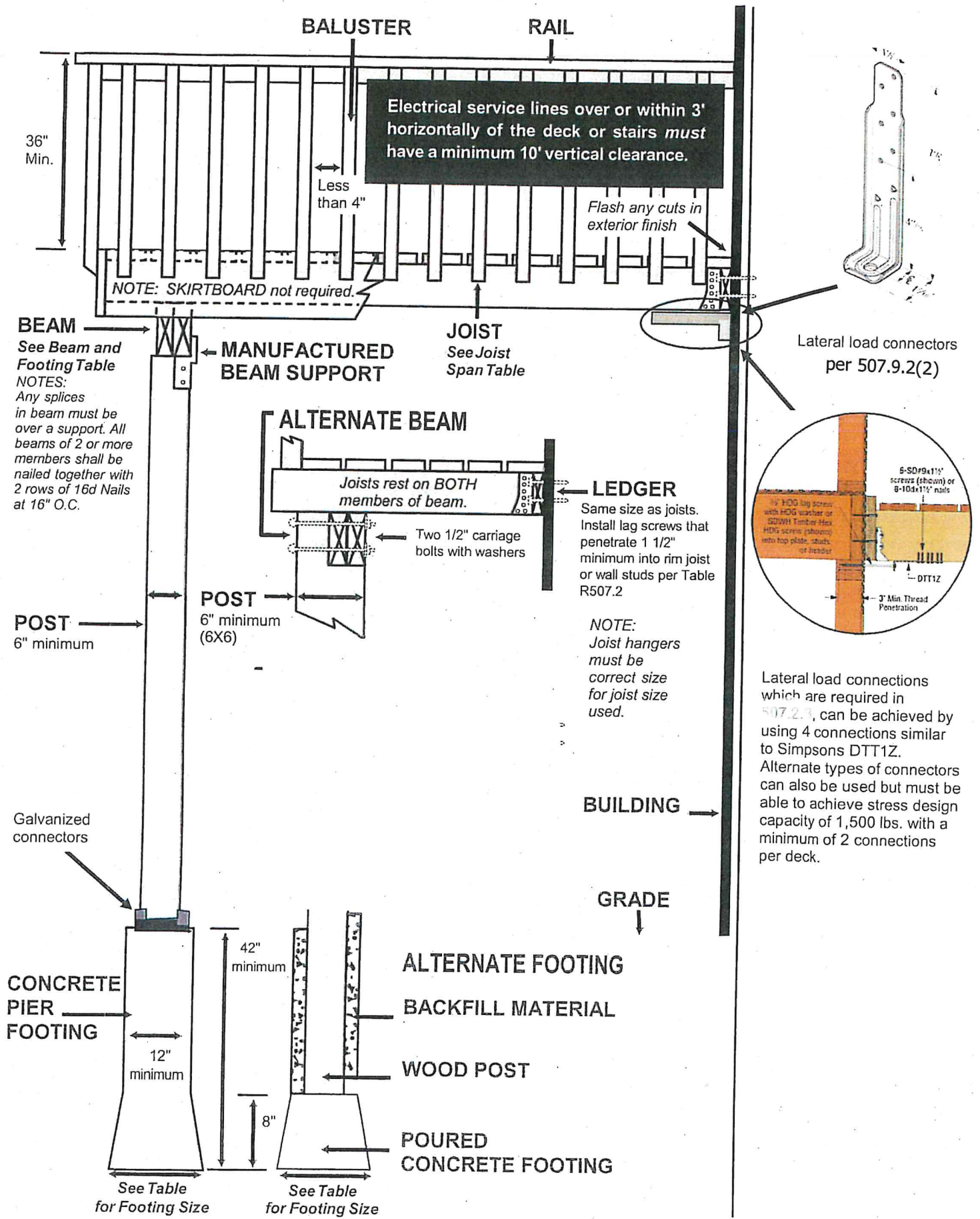
How to use this table: 1) We will use the 50 section in the first column. 2) The tributary area from the second column. 3) The 1500 column for soils.

**TABLE R507.3.1
MINIMUM FOOTING SIZE FOR DECKS**

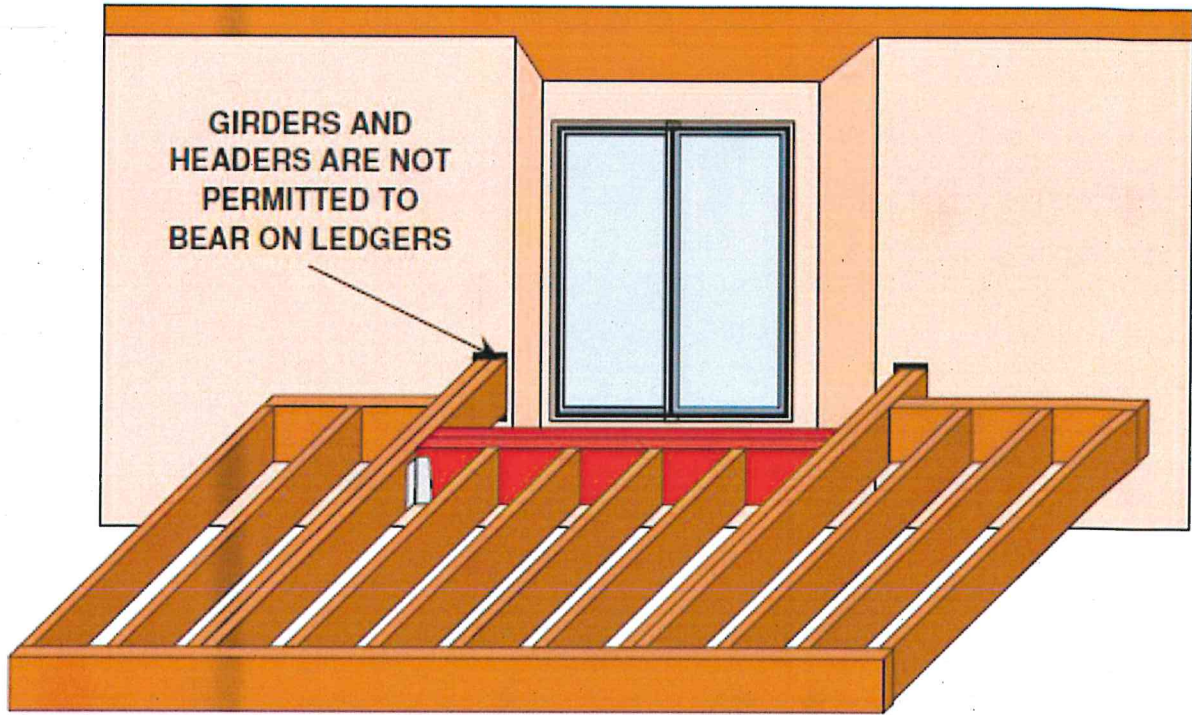
LIVE OR GROUND SNOW LOAD ^b (psf)	TRIBUTARY AREA (sq. ft.)	LOAD BEARING VALUE OF SOILS ^{a,c,d} (psf)											
		1500 ^a			2000 ^a			2500 ^a			≥ 3000 ^a		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)	Side of a square footing (inches)	Diameter of a round 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 m², 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.

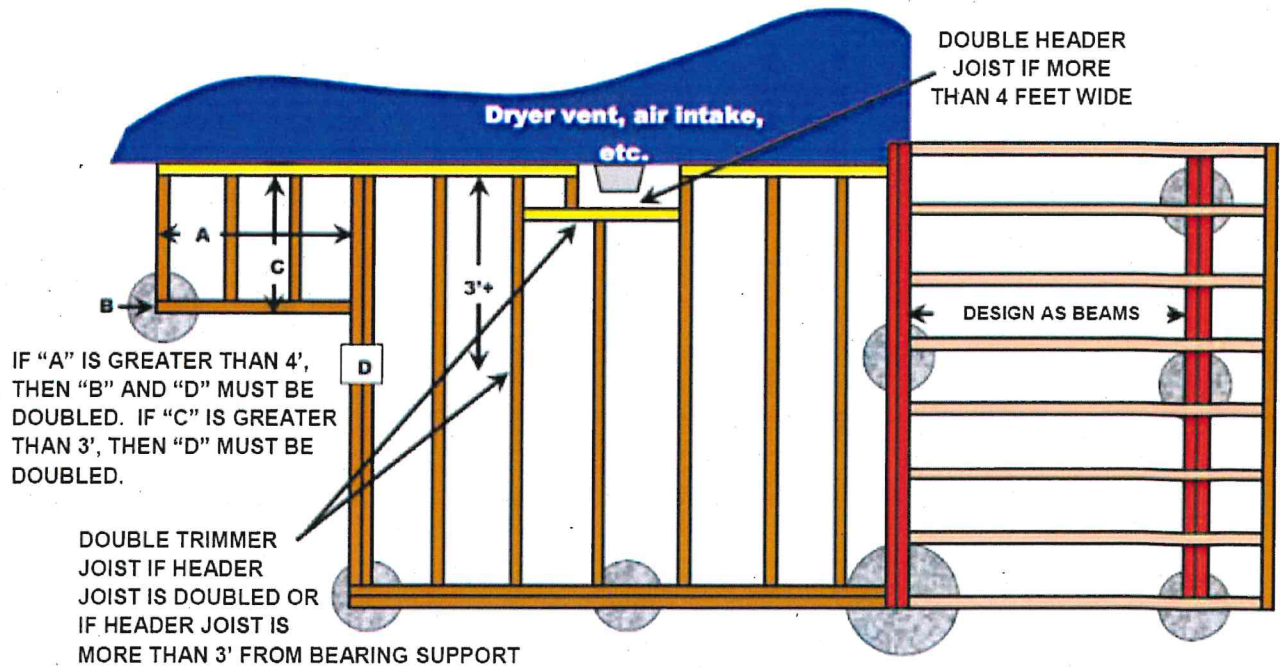
- Area 2 3*6=18 For 18 we use 20 so footing needs to be 12" square or 14" round
- Area 3 6*6=36 For 36 we need to use the 40 section which gives us 16" square or 19" round
- Area 4 3*6=18 For 18 we again use 20 so footing is 12" square or 14" round



HOUSE CANTILEVERS



SPECIAL FLOOR FRAMING DETAILS

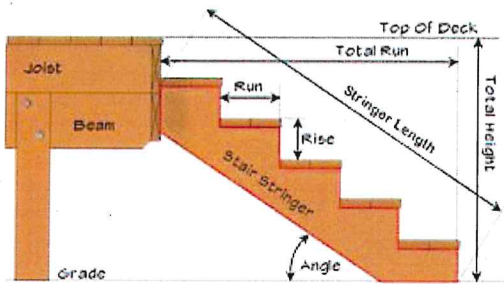


STAIRS

Stairs must have a maximum rise of $7\frac{3}{4}$ inches and a minimum run of 10 inches measured as shown. The greatest riser height within any flight of stairs shall not exceed the smallest by more than $\frac{3}{8}$ inch. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than $\frac{3}{8}$ inch. **Open risers are permitted provided that a 4" diameter sphere will not pass between the treads.**

Stairs must be a minimum of 36 inch wide above the handrail and 31½ inches below the handrail.

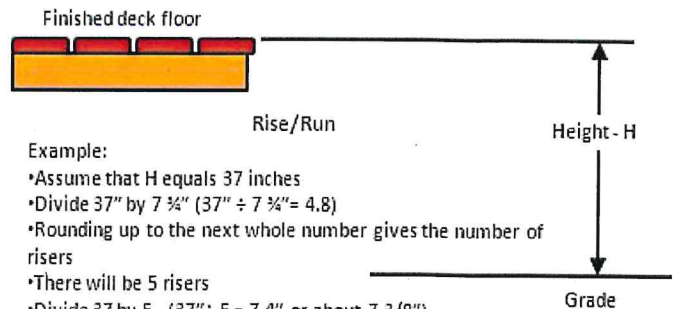
STAIR TERMINOLOGY



Stair Basics

- The maximum riser height is $7\frac{3}{4}$ inches
- The minimum tread run is 10 inches
- Treads and risers should be approximately equal with the largest not exceeding the smallest by more than $\frac{3}{8}$ inch.

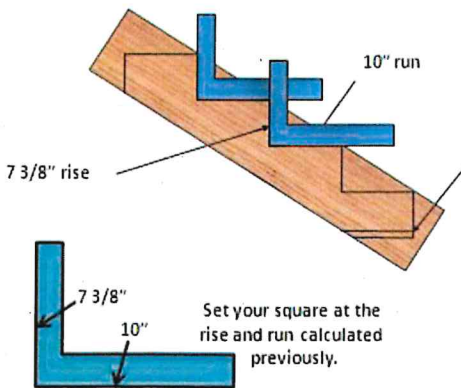
DETERMINING RISE/RUN



Example:

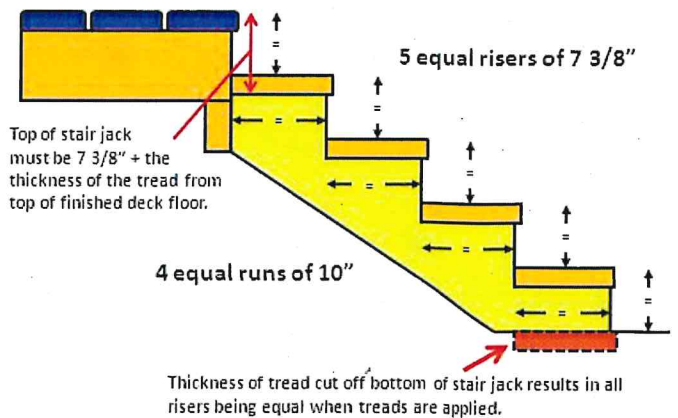
- Assume that H equals 37 inches
- Divide 37" by $7\frac{3}{4}$ " ($37" \div 7\frac{3}{4}" = 4.8$)
- Rounding up to the next whole number gives the number of risers
- There will be 5 risers
- Divide 37 by 5. ($37" \div 5 = 7.4"$ or about $7\frac{3}{8}"$)
- Each riser will be $7\frac{3}{8}"$
- For 5 risers there will be 4 treads
- Since each tread must be at least 10", the length of the stair from the face of the deck to the face of the bottom riser will be at least 40" ($10" \times 4 \text{ treads} = 40"$)

LAYING OUT STAIR JACKS

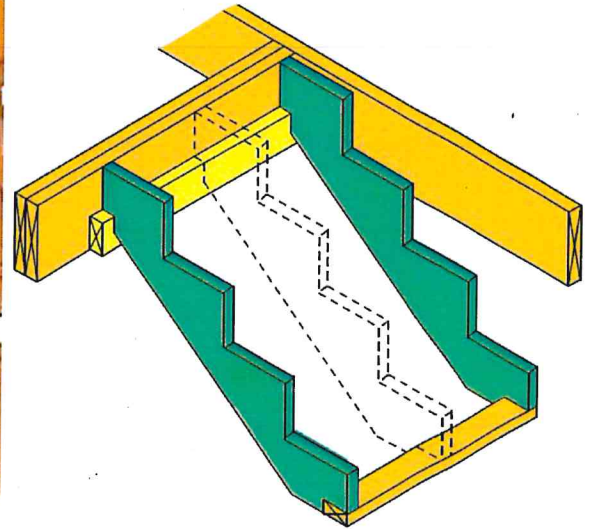
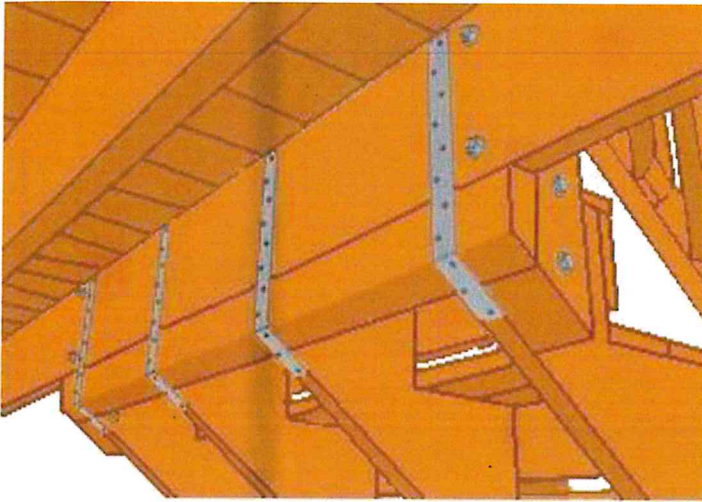


Cut an amount equal to the thickness of the tread from the bottom of the stair jack

THE COMPLETED STAIR



Top of stair jack must be $7\frac{3}{8}"$ + the thickness of the tread from top of finished deck floor.



GUARDS AND HANDRAILS

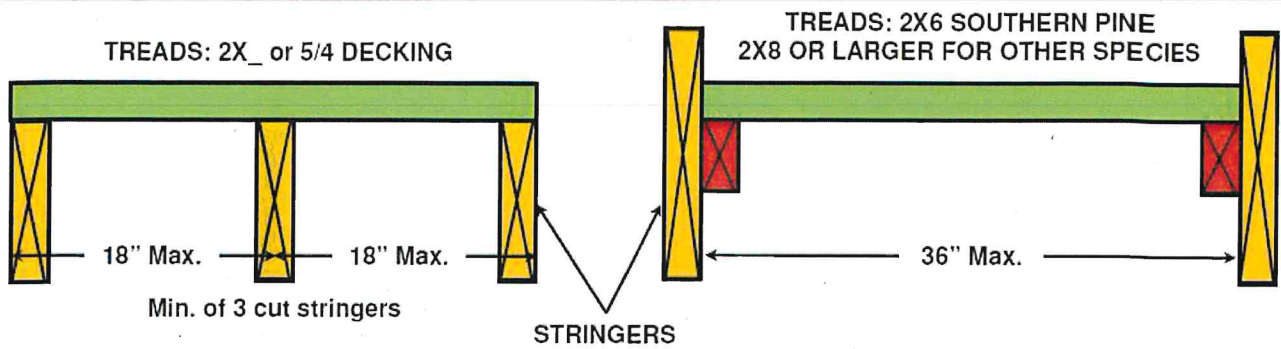
Guards and handrails must be provided as shown on the following illustrations. Guards must continue down stairs where the stair is more than 30 inches above grade. The height of guards on stairs must be 34 inches minimum.

Handrails must be provided on at least one side when there are four or more risers.

Handrails must have returns on each end or terminate in a newel post. Other handrail shapes having an equivalent gripping shape may be used with prior approval of the Building Department.

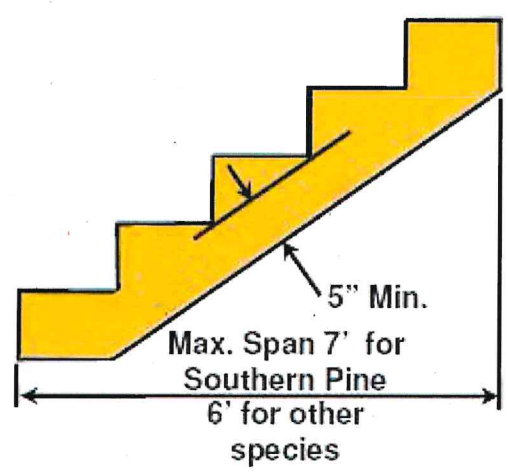
Handrails must be continuous for the entire length of the stairs and may not be interrupted by newel posts except at landings.

Hand rails and guards must be designed to support a 200 lb load applied in any direction at any point along the top of the guard or rail. The bottoms of the stringers should rest on a sound foundation such as a gravel bed, a concrete pad, pavers, or similar.

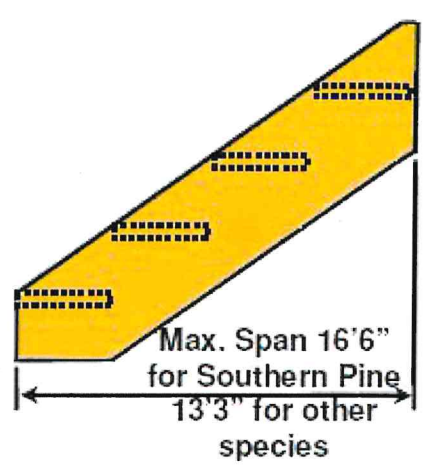


STAIR STRINGER SPANS

LANDINGS OR COLUMNS AND BEAMS MAY BE USED TO SHORTEN STRINGER SPANS



CUT STRINGER



SOLID STRINGER

STAIR ATTACHMENTS

