



General Information

- **Site Card.** Before starting construction, post the site card (issued by the City) in a front window visible from the street.
- **Miss Dig.** Before you dig, call Miss Dig at 800.482.7171
- This handout is provided as a guide and does not preclude other designs based upon approved engineering principles.

Zoning Ordinance Requirements

- Please see the attached Frequently Asked Questions (FAQs) page.
- The Zoning Ordinance impacts the allowed placement of a residential deck. It is recommended that you understand the provisions pertaining to your zone district before designing a proposed deck.

Building Code Requirements

- **Permit Requirement.** A building permit is required for the construction of any deck that is attached to or adjacent to a house. For a freestanding deck not adjacent to a house, a building permit is required for a deck 200 square feet or larger with supporting beams, joists or posts. Deck construction shall meet the requirements of the current Michigan State Residential Code, which is derived from the International Residential Code.
- **Footings.** Footings shall be designed and constructed below frost depth. A 42" minimum ground cover is required from bottom of footing to grade (see pages 4 & 5). MRC 403.1.4.
- **Posts/Columns.** Columns and posts in contact with the ground or embedded in concrete must be of pressure treated wood approved for ground contact. MRC 319.1.3.
- **Connection to Building.** Ledger boards shall be bolted or lagged to the existing building framing with a minimum of two 1/2" lags or machine bolts, double dipped galvanized or stainless steel, 4" to 6" long, at 16" on center or equivalent. (Lag tips should protrude from band joist.) All connections between the deck and dwelling must be flashed with corrosion-resistive flashing (see page 4). MRC 703.8. Solid blocking must be provided for the attachment of the deck ledger board (not rim board alone). 502.2.1.

- **Loading.** Decks shall be designed and constructed to support a minimum live load of 40 pounds per square foot. The dead load is assumed to be a minimum of 10 pounds per square foot for a total design load of 50 pounds per square foot. MRC R301.4, R301.5 & R502.3.2. Additional loads shall be considered if a spa is to be placed on the deck.
- **Materials.** Decks exposed to the weather must be constructed with wood of natural resistance to decay or treated wood. This includes horizontal members such as beams, joists, ledger boards and decking; and vertical members such as posts, poles, guards, handrails and columns. Other man made products are subject to approval by the Building Inspections Division before use. MRC 319
- **Joists/Beams.** Joists shall not overhang beams by more than 2' - 0", nor shall beams overhang posts by more than 1' - 0" at each end. MRC 502.2.
- **Fasteners.** Fasteners and hangers need to be hot dipped galvanized steel, stainless steel, copper, or equivalent.
- **Railings.** All decks, balconies, or porches which are more than 30" above grade or a floor below must be protected by a guard a minimum of 36" above the finished deck surface. Guards and stair railings shall have horizontal, vertical, diagonal or other ornamental intermediate rails through which a sphere 4" in diameter cannot pass (see pages 5 & 6). MRC 312.
- **Power Lines.** The electrical code requires overhead power lines to be located a minimum of 10' - 0" above decks and platforms. Existing lines may need to be raised if a new deck is to be installed beneath them. Contact your electric company.

Application Requirements

A completed Building Permit Application is required to obtain a building permit. An application form is available on-line at www.grandrapidsmi.gov.

The following plans also are required:

- Building Plans showing proposed structures in detail
- Site Plan showing property lines, existing and proposed structures, driveways, sidewalks, streets, easements, and overhead power lines

Permit Guide

Residential Decks

Who Should Apply for a Building Permit?

While homeowners may apply for permits, the City will hold the applicant responsible for the work, regardless of the party that actually performed it.

If a contractor is performing the work, it is recommended that the contractor apply for the permit. In order to apply, a contractor must be licensed with the State and registered with the City.

Review Process

1. Applicant submits a completed Building Permit Application form and required plans
2. Development Center staff identifies required reviews
3. Applicant obtains all required sign-offs by reviewers
4. Development Center staff collects building permit fee and issues building site card
5. As applicable, applicant submits Electrical Permit Application and fees to the Development Center and obtains that permit

How Much Time Does It Take?

The Development Center's goal is to review single family residential projects the same day a complete application (including required plans) is received. An incomplete application form and/or inadequate plans will delay the process. Simple projects may be approved within a few minutes.

The review time frame may be extended for:

- Duplex or multiple-unit residential properties
- Projects involving a change in the use of a property (example: conversion of a store-front commercial space to a residence)
- Projects located within a Planned Redevelopment District (PRD)

Fees

The building permit fee for a residential deck is: \$72 online / \$82 paper. If combining with a pool permit, a discount is given. A deck/pool combination permit is \$112 online / \$122 paper.

Inspections

Once a permit is issued, construction may begin. As the project progresses, the Building Inspections Division will need to inspect the work being performed. The following inspections are required for most decks:

1. **Footing Inspection.** After holes are dug and *before* cement is poured
2. **Final Inspection.** After completion of the deck and finish grading

Other Inspection. In addition to the above inspections, the inspector may require other inspections to ensure compliance with the Code.

Please call the building inspector listed on the site card to request an inspection. Every effort is made to perform an inspection within two (2) business days following the request. You should have your address available when you call. Inspectors' work schedules fill up quickly at certain times of the year. Calling more than a day in advance can help to avoid potential delays in the progress of your project.

Time Limitations

If work is not started within 180 days of the issuance of a building permit, the permit will have expired. Likewise, if work on the project is suspended for a period of 180 days, the permit will have expired.

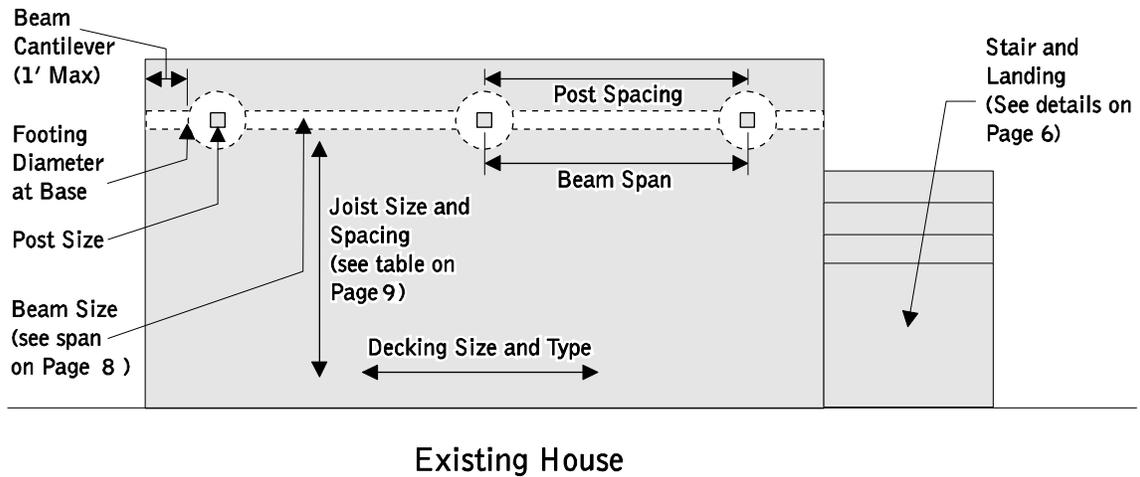
For More Information

www.grandrapidsmi.gov

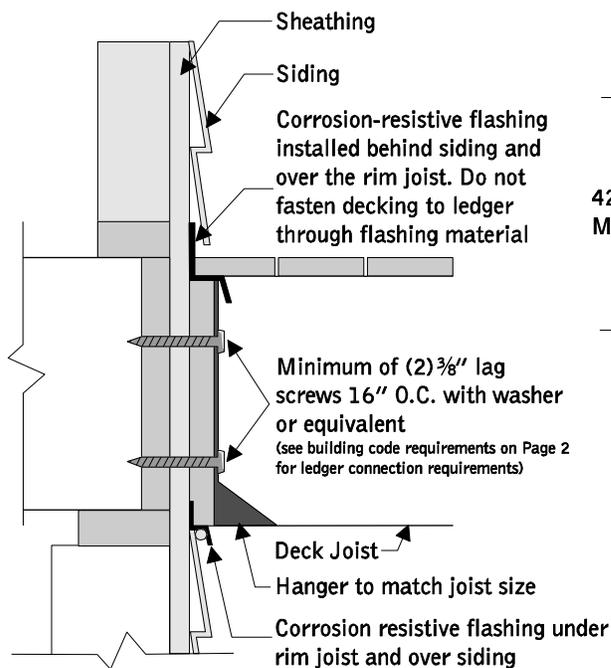
City of Grand Rapids Development Center
1120 Monroe Ave. NW, 2nd Floor
Grand Rapids, MI 49503
Telephone: 616.456.4100

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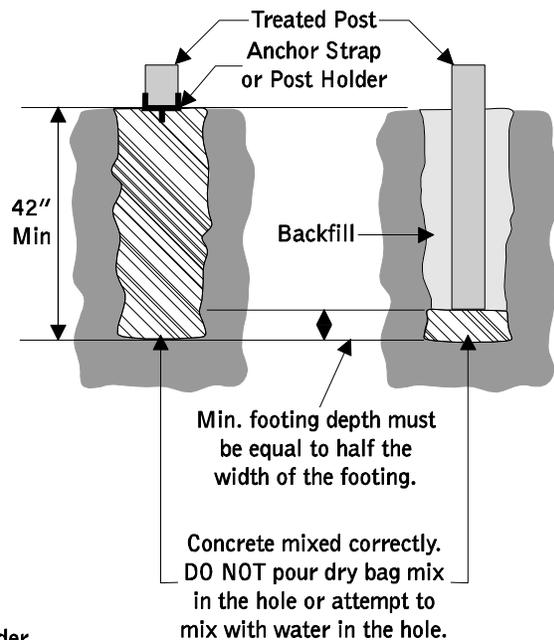
Sample Floor Plan



Ledger Connection Detail

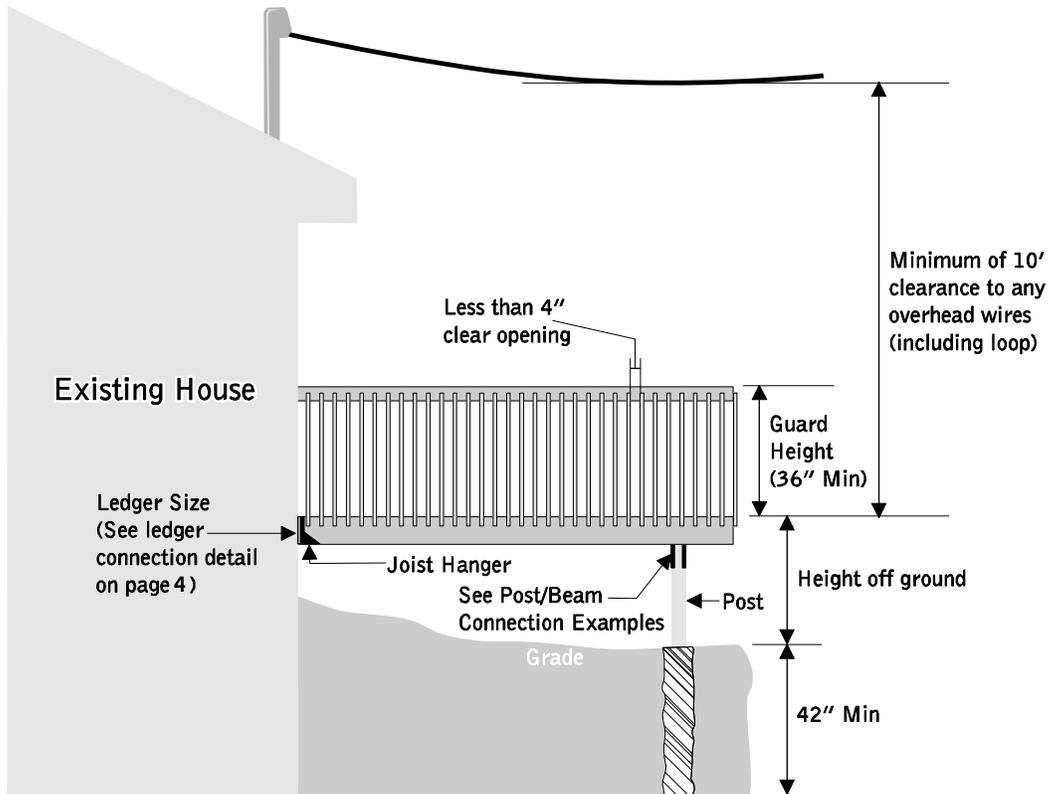


Typical Post Footing Examples

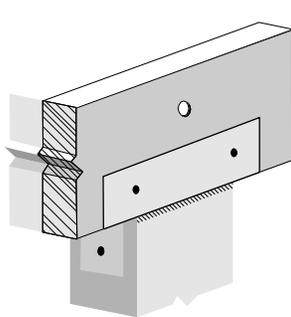


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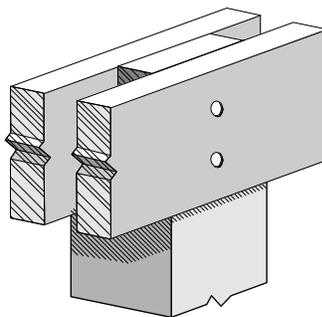
Side Elevation



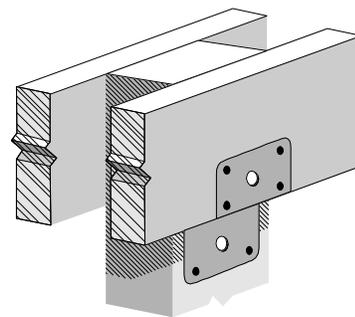
Post Beam Connections



Top Mount
Bolts and nails as required
by manufacturers specifications



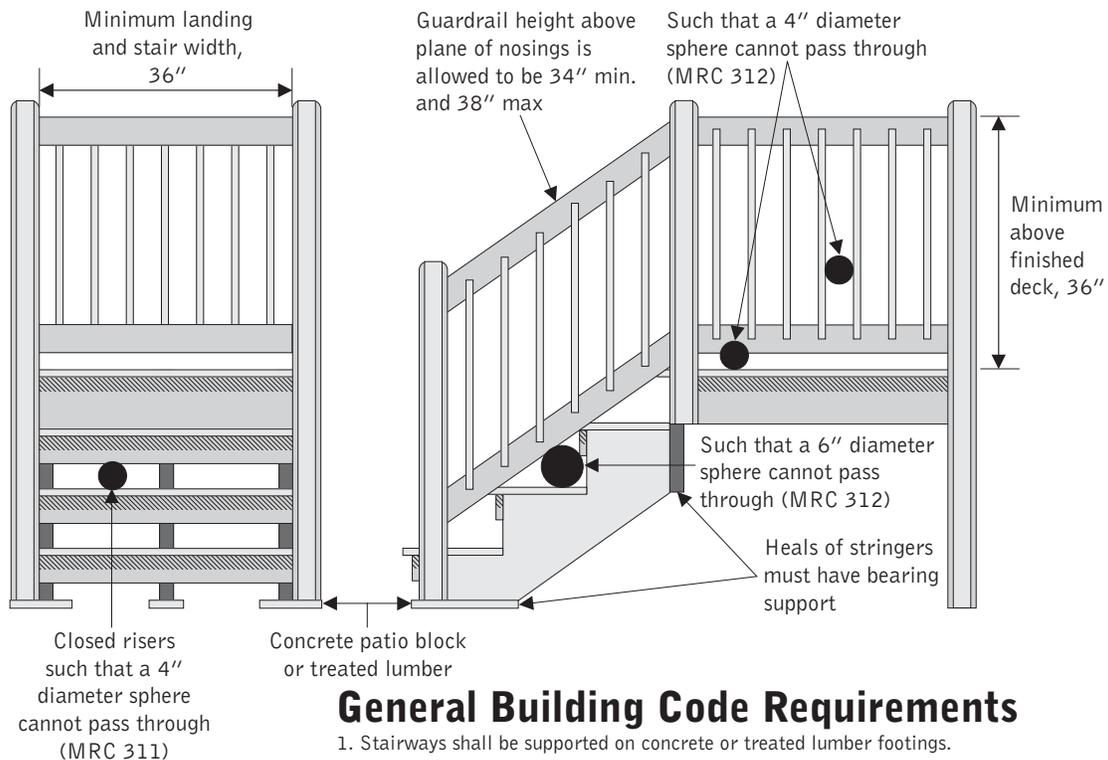
Notch Post
Minimum (2)
carriage bolts



Side Mount
Bolts and nails as required
by manufacturers specifications

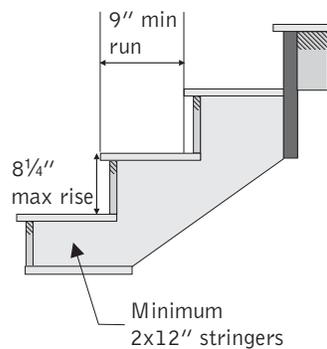
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Stair And Landing Requirements



General Building Code Requirements

1. Stairways shall be supported on concrete or treated lumber footings.
2. Stairways to have a minimum width of 36" with a maximum rise of 8 $\frac{1}{4}$ " and a minimum run of 9". The greatest riser height or tread depth in a flight of stairs shall not exceed the smallest by more than $\frac{3}{8}$ ". (MRC 311)
3. Nosing: the radius of curvature at the leading edge of the tread shall be no greater than $\frac{1}{16}$ " (14.3 mm). A nosing not less than $\frac{3}{4}$ " (19 mm) but not more than 1 $\frac{1}{4}$ " (32 mm) shall be provided on stairways with solid risers. The greatest nosing projection shall not exceed the smallest nosing projection by more than $\frac{3}{8}$ " (9.5 mm) between two stories, including the nosing at the level of floors and landings. Beveling of nosing shall not exceed $\frac{1}{2}$ " (12.7 mm). Risers shall be vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 (0.51 rad) degrees from the vertical. Open risers are permitted, provided that the opening between treads does not permit the passage of a 4-inch diameter (102 mm) sphere.(MRC 311)
 - A. A nosing is not required where the tread depth is a minimum of 11 inches (279 mm).
 - B. The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.
4. A stairway with 4 or more risers shall have a handrail 34-38" above the nose of the tread to the top of the handrail. (MRC 311)
5. The handrail shall be continuous the full length of the stairway and shall be returned or terminated at a newel post or safety terminal. (MRC 311)
6. A minimum 36"x36" landing is required at the top of the stairs. A landing or flat ground may be used at the bottom of the stairs. (MRC 311)
7. The triangle area between the stair riser and tread at the bottom of the guard must be such that a sphere 6" in diameter cannot pass through.(MRC 312)
8. All decks, balconies or porches which are more than 30" above grade or a floor below must be protected by a guard a minimum of 36" above the finished surface. (MRC 312)



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Handrail Requirements

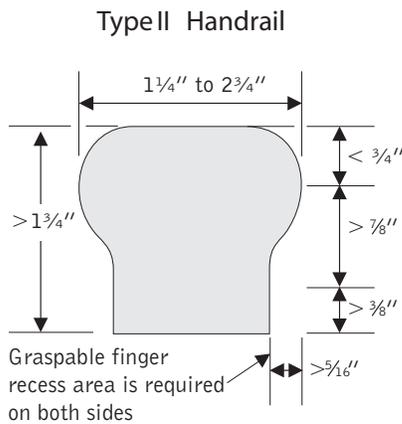
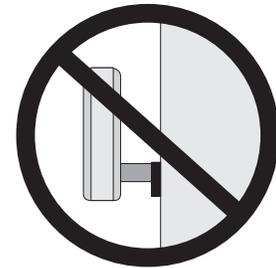
R311.5.6.3 Handrail grip size.

All required handrails shall be of one of the following types or provide equivalent graspability.

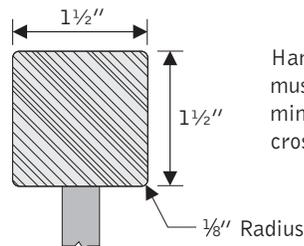
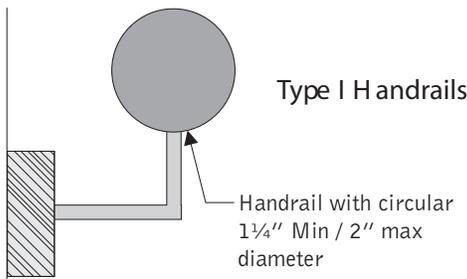
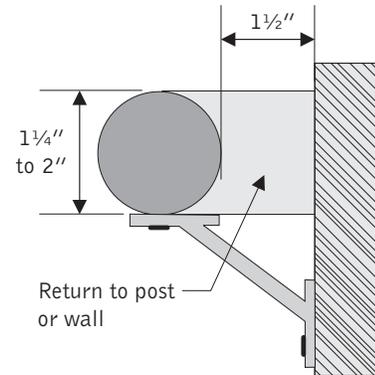
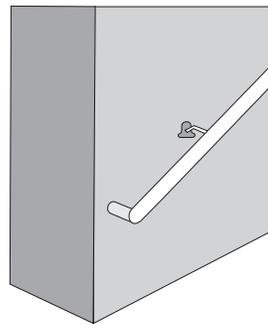
1. Type I. Handrails with a circular cross section shall have an outside diameter of at least 1 1/4 inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6 1/4 inches (160 mm) with a maximum cross section dimension of 2 1/4 inches (57 mm).
2. Type H Handrails with a perimeter greater than 6 1/4 inches (160 mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of 3/4 inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16 inch (8 mm) within 7/8 inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least 3/8 inch (10 mm) to a level that is not less than 1 3/4 inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 1/4 inches (32 mm) to a maximum of 2 3/4 inches (70 mm). Edges shall have a minimum radius of 0.01 inches (0.25 mm).



NOT ACCEPTABLE



Handrail returned to newel post or wall at or beyond top and bottom tread nosings. (MRC 311.5.6.2)



Handrail that is not circular must have a perimeter of 4" min / 6 1/4" max with a maximum cross section dimension of 2 1/4"

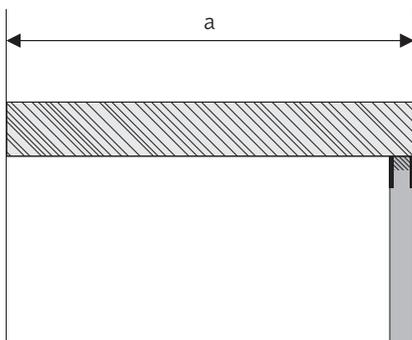
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Joist Span Table

Based on No. 2 or better wood grades.
(Design load = 40#ll+20#dl, Deflection=1/360)

	Southern Pine			Spruce - Pine - Fir		
	12" O.C.	16" O.C.	24" O.C.	12" O.C.	16" O.C.	24" O.C.
2x6	10'9"	9'6"	7'9"	10'3"	6'1"	7'5"
2x8	14'2"	12'4"	10'	13'3"	11'6"	9'5"
2x10	16'11"	14'8"	12'	16'3"	14'1"	11'6"
2x12	19'10"	17'2"	14'	18'10"	16'3"	13'4"

Joists shall be supported laterally at the ends by full depth solid blocking not less than 2" nominal thickness. MRC R502.7



Simple calculations for using joist span and beam size tables

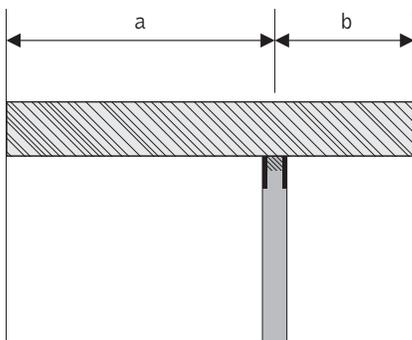
Refer to tables for joist and beam requirements

Example, $a = 12'$; Post spacing = 8'

Use joist span table to find the acceptable joist sizes for a 12' span, 2x8's at 12" O.C. or 2x12's at 24" O.C.

Use the beam table (see page 9) to find the 8' post spacing column.

With a 12' deck span, the beam may be either two 2x8's or two 2x10's, depending on wood used.



Refer to tables for joist and beam requirements

Example, $a = 8'$, $b = 2'$, Post spacing = 10'

Use "a" to determine joist size and "a+b" to determine beam size. The length of "b" is restricted by both the length of "a" and the size of the joists.

Refer to the joist span table. For a 8' joist span, either 2x8's at 24" O.C. or 2x6's at 16" O.C. are acceptable.

For sizing the beam, use a joist length of 10' ($8' + 2'$) and a post spacing of 10'. The beam table indicates that the beam may be either two 2x10's or two 2x12's depending on wood used.

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Beam Size Table

Based on No. 2 or better Spruce Pine fir Southern Pine.
Treated for weather and/or ground exposure

		Post Spacing										
		4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'
6'	Southern Pine	1-2x6	1-2x6	1-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x6	2-2x10	2-2x10	2-2x10
	Ponderosa Pine	1-2x6	1-2x6	1-2x8	2-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10
7'	Southern Pine	1-2x6	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	3-2x10
	Ponderosa Pine	1-2x6	1-2x6	1-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x10	2-2x12	3-2x10	3-2x10
8'	Southern Pine	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	2-2x12
	Ponderosa Pine	1-2x6	2-2x6	2-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	3-2x10	3-2x10	3-2x12
9'	Southern Pine	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10
	Ponderosa Pine	1-2x6	2-2x6	2-2x6	2-2x6	2-2x10	2-2x10	2-2x10	3-2x10	2-2x12	3-2x12	3-2x12
10'	Southern Pine	1-2x6	2-2x6	2-2x6	2-2x8	2-2x6	2-2x6	2-2x10	2-2x12	2-2x12	3-2x10	3-2x10
	Ponderosa Pine	1-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	2-2x12	3-2x10	3-2x10	3-2x12
11'	Southern Pine	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12
	Ponderosa Pine	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	
12'	Southern Pine	1-2x6	2-2x6	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	2-2x12	3-2x12
	Ponderosa Pine	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	2-2x10	3-2x12		
13'	Southern Pine	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x12	3-2x12	3-2x12
	Ponderosa Pine	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	3-2x12	3-2x12			
14'	Southern Pine	1-2x6	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x10	2-2x10	2-2x12	3-2x12	3-2x12
	Ponderosa Pine	2-2x6	2-2x6	2-2x8	2-2x10	2-2x12	3-2x10	3-2x10	3-2x12			
15'	Southern Pine	2-2x6	2-2x6	2-2x8	2-2x6	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	
	Ponderosa Pine	2-2x6	2-2x6	2-2x8	2-2x10	3-2x10	3-2x10	3-2x10	3-2x10			
16'	Southern Pine	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	
	Ponderosa Pine	2-2x6	2-2x6	2-2x10	2-2x10	3-2x10	3-2x10	3-2x10	3-2x10			
Required footing diameter at base of center columns		14"	16"	18"	20"	22"						

Note: Joist length is the total length of the joist including any cantilevers.