



Residential Decks

General Residential Decks Information

- Building Permits** In general, a building permit is required for a deck that is attached to a structure or for any detached deck that is more than 30 inches above grade.
- Setbacks** Setbacks must comply with applicable Zoning requirements.
- Frost Footings** Frost footings are required for any deck that is attached to a dwelling, a porch, or a garage that has frost footings. The minimum depth to the base of the footing is 42 inches.
- Live Loads** All decks shall be designed to support a live load of 40 pounds per square foot.
- Guardrails** Guardrails are required on all decks that are more than 30 inches above grade or above a lower deck. Railing must be a minimum of 36 inches in height. Open guardrails on decks must have intermediate rails or an ornamental pattern that a four-inch (4") sphere cannot pass through. Open railings on stairs must have intermediate rails or an ornamental pattern that a four-and-three-eighths-inch (4-3/8") sphere cannot pass through. Exception: The triangular opening formed by the riser, the tread, and the bottom element of a guardrail may be sized so that a six-inch (6") sphere cannot pass through.
- Cantilevers** Joists should not overhang beams by more than two feet (2'). Beams should not overhang posts by more than one foot (1') unless a special design is approved.
- Flashing** All connections between a deck and a dwelling shall be weatherproof. Any cuts in an exterior finish shall be flashed.
- Framing Details** Header beams and joists that frame into ledgers or beams shall be supported by approved framing anchors such as joist hangers.
- Nails and Screws** Fasteners must be hot-dipped-zinc-coated-galvanized steel, stainless steel, silicon bronze, or copper.
- Deck Materials** All exposed materials used in the construction of a deck must be of approved wood with natural resistance to decay (redwood, cedar, et cetera), approved treated wood, or other materials such as composite plastics that have prior approval of the Building Official. This includes materials for posts, beams, joists, decking, and railings.
- Stairs** Stairs must be a minimum of 36 inches in width. The maximum rise is seven-and-three-quarters inches (7-3/4") and the minimum rise is four inches (4"). The minimum run is ten inches (10"). The largest tread width or riser height shall not exceed the smallest by more than 3/8 inch.
Risers must not allow a four-inch (4") sphere to pass through.
- Handrails** Stairways having four or more risers shall have at least one (1) handrail. The top of the handrail shall be between 34 inches and 38 inches above the nosing of the treads. **Handrails shall be continuous for the entire length of the stairs and shall not be interrupted by a post. Handrail ends shall be returned or shall terminate at posts.** Handrails must be Type I or Type II **graspable** design. The handgrip shall have a smooth surface with no sharp corners.
- Special Design Note** Some deck designs may not be appropriate when the placement of a screen porch or a three-season porch on the deck platform is a future consideration. Setbacks for porches may not be the same as setbacks for decks.

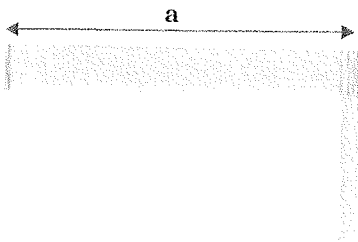
Deck Joist Spans

- Based On Number Two (2) Or Better Wood Grades
- Design Loads: 40# LL + 10# DL / Deflection: L/360

	Ponderosa Pine			Southern Pine			Western Cedar		
	12" oc	16" oc	24" oc	12" oc	16" oc	24" oc	12" oc	16" oc	24" oc
2 x 4	9-2	8-4	7-0	10-9	9-9	8-6	9-2	8-4	7-3
2 x 8	12-1	10-10	8-10	14-2	12-10	11-0	12-1	11-0	9-2
2 x 10	15-4	13-3	10-10	18-0	16-1	13-5	15-5	13-9	11-3
2 x 12	17-9	15-5	12-7	21-9	19-0	15-4	18-5	16-0	13-0

Sample Calculations for Using Joist Span, Beam Size and Footing Sizes Tables

Case One



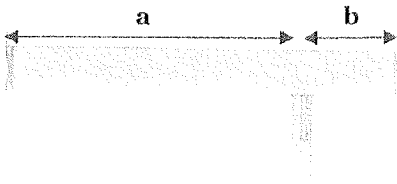
Refer to tables for joist, beam, and footing size requirements.

Example: Span "a" = 12'. Post Spacing = 8'.

Use the **Joist Span Table** to find the acceptable joist sizes for a 12' span, 2x8s at 12" oc, 2x10s at 16" oc, or 2x12s at 24" oc.

Use the **Beam and Footing Sizes Table** and find the 8' post spacing column. With a 12' deck span, the beam may be either two 2x8s or two 2x10s, depending on the wood used. Depending on the soil, the footing diameter at the base must be a minimum of 12", 10", or 9" for the corner post and 17", 14", or 12" for all intermediate posts.

Case Two



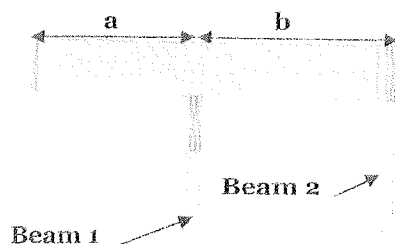
Use "a" to determine joist size and "a" + "b" to determine beam and footing sizes. The length of "b" is restricted by both the length of "a" and the size of the joists.

Example: "a" = 8', "b" = 2', Post Spacing = 10'.

Refer to the **Joist Span Table**. For an 8' joist span, either 2x8s at 24" oc or 2x6s at 16" oc are acceptable.

For sizing the beam, use a joist length of 12' (8' + 4') and a post spacing of 10'. The **Beam and Footing Sizes Table** indicates that the beam may be either two 2x10s or two 2x12s, depending on wood used. Depending on the type of soil, the footing diameter at the base must be a minimum of 15", 12" or 11" for the corner post and 20", 17", or 15" for all intermediate posts. Note that because of the 2' cantilever, all footing sizes were increased by 1" as required by the footnote.

Case Three



Use "a" or "b", whichever is greater, to determine the joist size. Use "a" + "b" to determine the size of Beam 1 and the post footing size for the posts supporting Beam 1. Use joist length "b" to determine both the size of Beam 2 and the post footing size for the posts supporting Beam 2.

Example: "a" = 6', "b" = 7', Post Spacing = 9'.

Joist size is determined by using the longest span joist (7'). The **Joist Span Table** indicates the 2x6s at 24" oc would be adequate for this span.

For Beam 1 and footings, use a joist length of 13' (6' + 7') and a post spacing of 9'. The **Beam and Footing Sizes Table** indicates that the beam may be two 2x10s or two 2x12s, depending on the wood used. Depending on the type of soil, the footing diameters for Beam 1 posts shall be 13", 11", or 9" for the corner (outside) post and 19", 15", or 13" for all intermediate posts. For Beam 2 and footings, use a joist length of 7' and post spacing of 9'. The beam may be two 2x8s or two 2x10s, depending on the wood used. Depending on the type of soil, the footing diameters for Beam 2 shall be 10", 8", or 7" for the corner posts, and 14", 11", or 10" for all intermediate posts.

Deck Beam and Footing Sizes

Table is based on Number Two (#2) or better Ponderosa Pine and Southern Pine that is treated for weather and/or ground exposure.

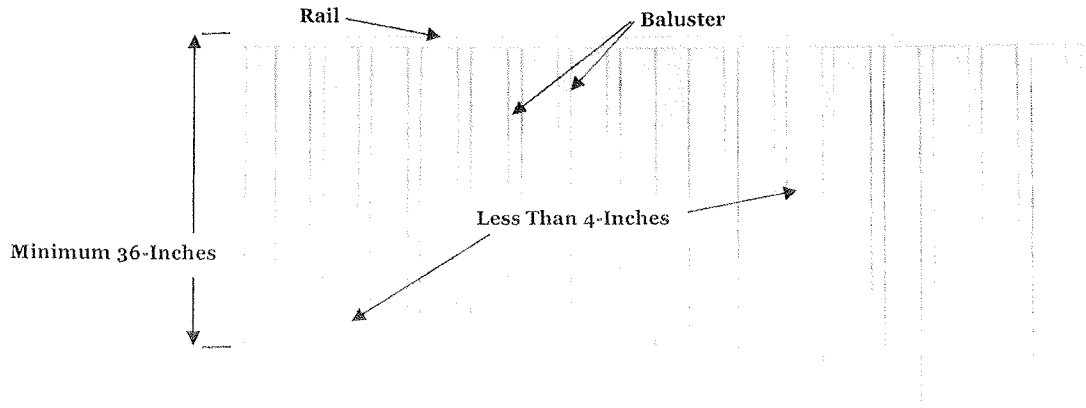
		Post Spacing											
		4-foot	5-foot	6-foot	7-foot	8-foot	9-foot	10-foot	11-foot	12-foot	13-foot	14-foot	
Joist Length	6-foot	Southern Pine Beam	1-2x6	1-2x6	1-2x6	2-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10
		Ponderosa Pine Beam	1-2x6	1-2x6	1-2x8	2-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10
		Corner Footing	6-5-4	7-6-5	7-6-5	8-7-6	9-7-6	9-7-6	10-8-7	10-8-7	10-9-7	11-9-8	11-9-8
		Intermediate Footing	9-8-7	10-8-7	10-9-7	11-9-8	12-10-9	13-10-9	14-11-10	14-12-10	15-12-10	15-13-11	16-13-11
	7-foot	Southern Pine Beam	1-2x6	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	2-2x12
		Ponderosa Pine Beam	1-2x6	1-2x6	1-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	2-2x12	3-2x10	3-2x10
		Corner Footing	7-5-5	7-6-5	8-7-6	9-7-6	9-8-7	10-8-7	10-8-7	11-9-8	11-9-8	12-10-9	12-10-9
		Intermediate Footing	9-8-7	10-8-7	11-9-8	12-10-9	13-11-9	14-11-10	15-12-10	15-13-11	16-13-11	17-14-12	17-14-12
	8-foot	Southern Pine Beam	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12
		Ponderosa Pine Beam	1-2x6	2-2x6	2-2x8	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	3-2x10	3-2x10	3-2x12
		Corner Footing	7-6-5	8-6-6	9-7-6	9-8-7	10-8-7	10-8-7	11-9-8	11-9-8	12-10-9	13-10-9	13-11-9
		Intermediate Footing	10-8-7	11-9-8	12-10-9	13-11-9	14-11-10	15-12-10	16-13-11	16-13-12	17-14-12	18-15-13	18-15-13
	9-foot	Southern Pine Beam	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10
		Ponderosa Pine Beam	1-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x10	3-2x10	3-2x10	3-2x12	3-2x12
		Corner Footing	7-6-5	8-7-6	9-7-6	10-8-7	10-9-7	11-9-8	12-10-8	12-10-9	13-10-9	13-11-9	14-11-10
		Intermediate Footing	10-9-7	12-10-8	13-10-9	14-11-10	15-12-10	16-13-11	17-14-12	17-14-12	18-15-13	19-15-13	20-16-14
10-foot	Southern Pine Beam	1-2x6	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x10	
	Ponderosa Pine Beam	1-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	EngBeam	
	Corner Footing	8-6-6	9-7-6	10-8-7	10-8-7	11-9-8	12-10-8	12-10-9	13-11-9	14-11-10	14-12-10	15-12-10	
	Intermediate Footing	11-9-8	12-10-9	14-11-10	15-12-10	16-13-11	17-14-12	17-14-12	18-15-13	19-16-14	20-16-14	21-17-15	
11-foot	Southern Pine Beam	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	
	Ponderosa Pine Beam	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	EngBeam	
	Corner Footing	8-7-6	9-7-6	10-8-7	11-9-8	12-9-8	12-10-9	13-11-9	14-11-10	14-12-10	15-12-10	15-13-11	
	Intermediate Footing	12-9-8	13-11-9	14-12-11	15-12-10	16-13-11	17-14-12	17-14-12	18-15-13	16-16-14	20-16-14	21-17-15	
12-foot	Southern Pine Beam	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x10	3-2x12	
	Ponderosa Pine Beam	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	2-2x12	3-2x12	3-2x12	EngBeam	EngBeam	
	Corner Footing	9-7-6	10-8-7	10-9-7	11-9-8	12-10-9	13-10-9	14-11-10	14-12-10	15-12-10	15-13-11	16-13-11	
	Intermediate Footing	12-10-9	14-11-10	15-12-10	16-13-11	17-14-12	18-15-13	19-16-14	20-16-14	21-17-15	22-18-15	23-18-16	
13-foot	Southern Pine Beam	1-2x6	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	
	Ponderosa Pine Beam	2-2x6	2-2x6	2-2x8	2-2x10	2-2x12	2-2x12	2-2x12	3+2x12	3-2x12	EngBeam	EngBeam	
	Corner Footing	9-7-6	10-8-7	11-9-8	12-10-8	13-10-9	13-11-9	14-12-10	15-12-10	15-13-11	16-13-11	17-14-12	
	Intermediate Footing	13-10-9	14-12-10	15-13-11	17-14-12	18-15-13	19-15-13	20-16-14	21-17-15	22-18-15	23-19-16	24-19-17	
14-foot	Southern Pine Beam	1-2x6	2-2x6	2-2x6	2-2x8	2-2x10	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	3-2x12	
	Ponderosa Pine Beam	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	3-2x10	3-2x12	3-2x12	EngBeam	EngBeam	EngBeam	
	Corner Footing	9-8-7	10-8-7	11-9-8	12-10-9	13-11-9	14-11-10	15-12-10	15-13-11	16-13-11	17-14-12	17-14-12	
	Intermediate Footing	13-11-9	15-12-10	16-13-11	17-14-12	18-15-13	20-16-14	21-17-15	22-18-15	23-18-16	24-19-17	24-20-17	
15-foot	Southern Pine Beam	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	EngBeam	
	Ponderosa Pine Beam	2-2x6	2-2x8	2-2x8	2-2x10	3-2x10	3-2x10	3-2x12	3-2x12	EngBeam	EngBeam	EngBeam	
	Corner Footing	10-8-7	11-9-8	12-10-8	13-10-9	14-11-10	14-12-10	15-12-11	16-13-11	17-14-12	17-14-12	18-15-13	
	Intermediate Footing	14-11-10	15-12-11	17-14-12	18-15-13	19-16-14	20-17-14	21-17-15	22-18-15	23-19-17	24-20-17	25-21-18	
16-foot	Southern Pine Beam	2-2x6	2-2x6	2-2x8	2-2x8	2-2x10	2-2x12	2-2x12	3-2x10	3-2x12	3-2x12	EngBeam	
	Ponderosa Pine Beam	2-2x6	2-2x8	2-2x10	2-2x10	3-2x10	3-2x10	3-2x12	3-2x12	EngBeam	EngBeam	EngBeam	
	Corner Footing	10-8-7	11-9-8	12-10-9	13-11-9	14-11-10	15-12-10	16-13-11	16-13-12	17-14-12	18-15-13	18-15-13	
	Intermediate Footing	14-11-10	16-13-11	17-14-12	18-15-13	20-16-14	21-17-15	22-18-16	23-19-16	24-20-17	25-21-18	26-21-18	

Notes

- Joist length is the total length of the joist, including any cantilevers.
- When the joint extends (cantilevers) beyond the support beam by 18" or more, add 1" to the footing dimensions shown.
- Requirements for future three-season porches or screen porches:
 - Increase the corner footing size shown by 90%; and
 - Increase the center footing size shown by 55%; and
 - Locate all footings at extremities of the deck, no cantilevers.
 - Beam sizes indicated need not be altered.
- All footing sizes above are base diameters in inches and are listed for three (3) soil types: **clay, sand, gravel**, in that order. Example: 6-5-4 indicates a footing size of six (6) inches in clay, five (5) inches in sand, four (4) inches in gravel.

Guards on Decks

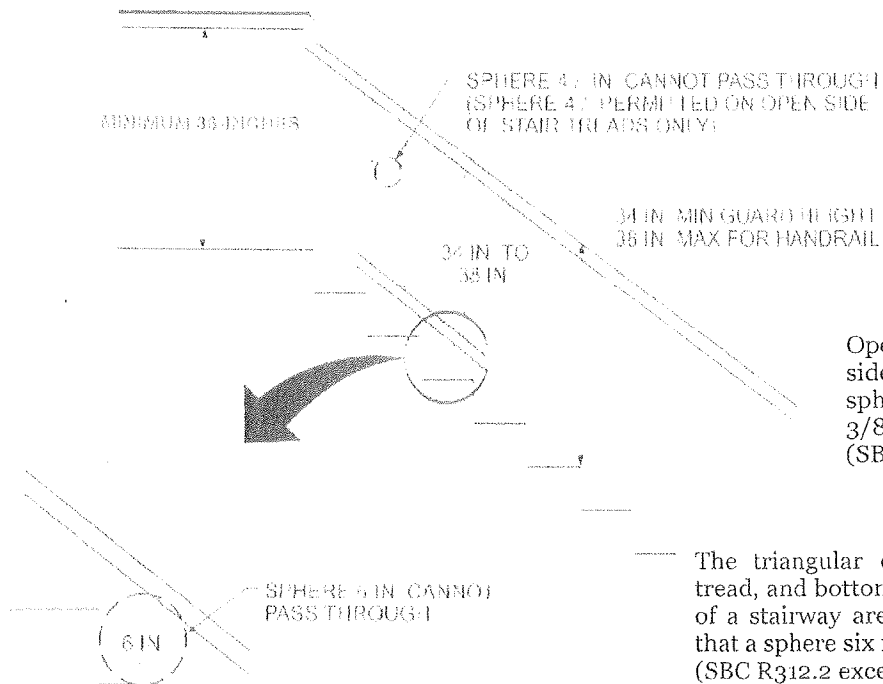
Porches, balconies, ramps, or raised floor surfaces located more than 30 inches above the floor or grade below shall have guards not less than 36 inches in height. (SBC R312.1)



Required guards on open sides of stairway, raised floor areas, balconies, and porches shall have intermediate rails or ornamental closures which do not allow passage of a sphere four inches (4") or more in diameter. (SBC R312.2)

Guards on Stairs

Open sides of stairs with a total rise of more than 30 inches above the floor or grade below shall have guards not less than 34 inches in height measured vertically from the nosing of the treads. (SBC R312.1)



Openings for required guards on the sides of stair treads shall not allow a sphere four-and-three-eighths inches (4-3/8") to pass through. (SBC R312.2 exception)

The triangular openings formed by the riser, tread, and bottom rail of a guard at the open side of a stairway are permitted to be of such a size that a sphere six inches (6") cannot pass through. (SBC R312.2 exception)

Stairs

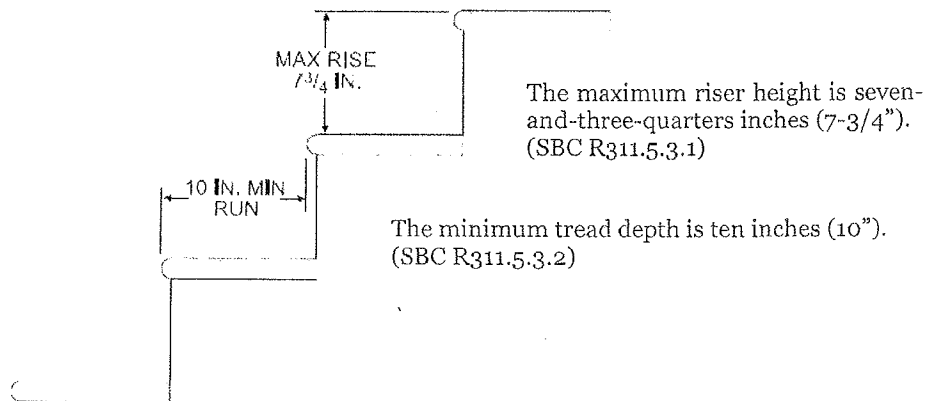
Illumination.

All stairs shall be provided with illumination. Exterior stairways shall be provided with an artificial light source located in the immediate vicinity of the top landing of the stairway. The illumination of exterior stairways shall be controlled from inside the dwelling unit. (SBC R303.6)

Width

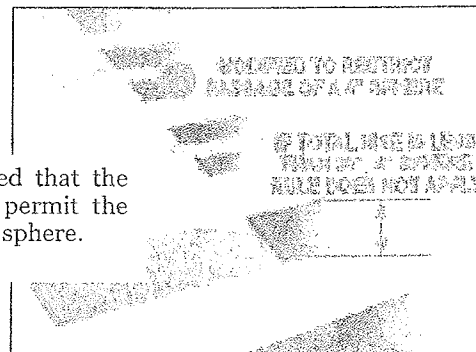
Stairways shall not be less than 36-inches in clear width at all points above the permitted handrail height and below the required headroom height. (SBC R311.5.1)

Stair Treads and Risers



Open Risers on Stairs

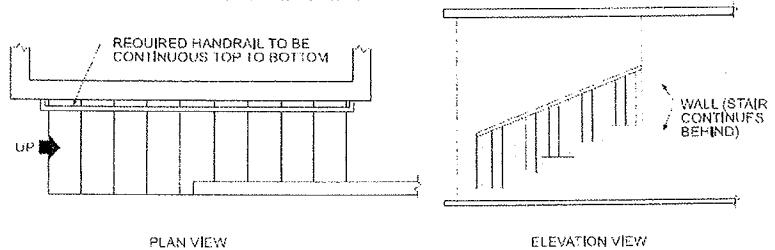
Open risers are permitted, provided that the opening between treads does not permit the passage of a four-inch diameter (4") sphere. (SBC R311.5.3.3)



Handrails

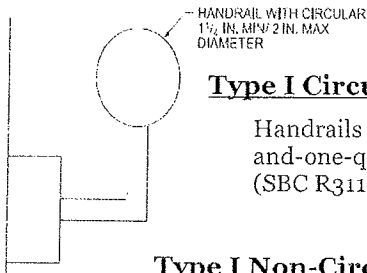
Continuous

Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than one-and-one-half inch (1-1/2") between the wall and the handrail. (SBC R311.5.6.2)



Grip Size

Handrails shall be of Type I or Type II or shall provide equivalent graspability. (SBC R311.5.6.3)

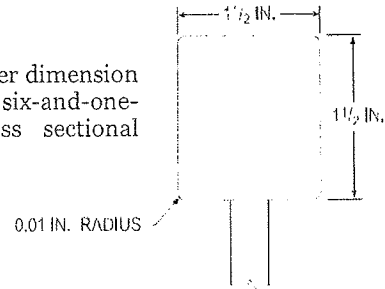


Type I Circular

Handrails with a circular cross section shall have an outside diameter of at least one-and-one-quarter inches (1-1/4") and not greater than two inches (2"). (SBC R311.5.6.3)

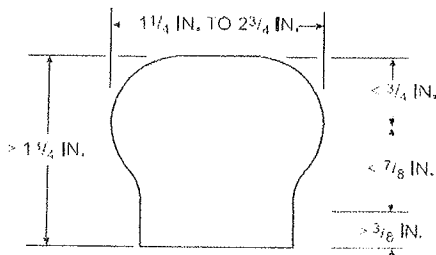
Type I Non-Circular

If the handrail is not circular, it shall have a perimeter dimension of at least four inches (4") and not greater than six-and-one-quarter inches (6-1/4") with a maximum cross sectional dimension of two-and-one-quarter inches (2-1/4"). (SBC R 311.5.6.3)



Type II

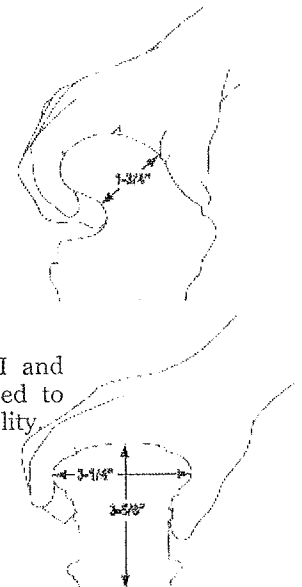
Handrails with a perimeter greater than six-and-one-quarter inches (6-1/4") shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of three-quarter inch (3/4") measured vertically from the tallest portion of the profile and achieve a depth of at least five-sixteenth inch (5/16") within seven-eighths inch (7/8") below the widest portion of the profile. This required depth shall continue for at least three-eighths inch (3/8") to a level that is not less than one-and-three-quarters inches (1-3/4") below the tallest portion of the profile. The minimum width of the handrail above the recess shall be one-and-one-quarter inches (1-1/4") to a maximum of two-and-three-quarter inches (2-3/4"). Edges shall have a minimum radius of 0.01 inch. (SBC R 311.5.6.3)



GRASPABLE FINGER RECESS AREA IS REQUIRED ON BOTH SIDES → ←

Equivalent Graspability

Profiles other than Type I and Type II may be determined to provide equivalent graspability (SBC R 311.5.6.3)



Deck Inspections

General Inspection Information

Construction or work for which a permit is required is **subject to inspection** by the building official and the construction or work shall remain **accessible** and **exposed** for inspection purposes until approved. (SBC MR 1300.0210, subpart 1)

It shall be the **duty of the permit applicant** to cause the work to remain accessible and exposed for inspection purposes. (SBC MR 1300.0210, subpart 1)

The **person doing the work** authorized by a permit shall notify the building official that the work is ready for inspection. The person requesting an inspection required by the code shall provide access to and means for inspection of the work. (SBC MR 1300.0210, subpart 4)

Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the building official. (SBC MR 1300.0210, subpart 5)

Required Inspections

Footing Inspection.

After the holes are dug; but, prior to the placement of concrete.

Framing Inspection.

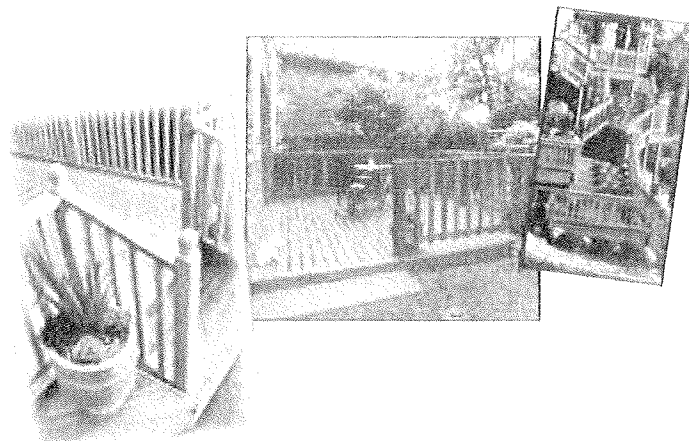
After framing is completed. This inspection can often be completed at the time of the final inspection when all parts of the framing remain visible and accessible.

Final Inspection.

After completion of the project.

Schedule Inspections

To schedule your inspection, call the Land Use Management Department at **651/385-3114**. Indicate what inspection is being requested and provide the **permit number** and the **jurisdiction** (city or township) of the project. Please **allow ample time** (typically a work day) to place the inspection on the schedule.





Deck Permits

Applicants for Building Permits in Goodhue County generally are required to provide the original Township Zoning Approval form, two (2) complete sets of project **construction plans**, and a **site plan** for review. County Zoning staff reviews submittals for compliance with the Zoning Ordinance. County Building staff reviews submittals for compliance with the State Building Code. One set of approved construction plans is retained by the County; one set of approved construction plans is returned to the applicant to be kept on-site throughout the construction period.

Locating a Deck

Decks must meet local zoning requirements for land use and setbacks. When planning a deck, thought should be given to the location of outside gas meters, outside electric meters, wells, and septic systems. Additionally, the electrical code requires that any overhead power lines be a minimum of ten feet (10') above decks and platforms.

Call Before You Dig

At least two full business days before you dig any footings, call *Gopher State One Call*. The Federal Communications Commission (FCC) has authorized 811 as a national, toll free "call-before-you-dig" number. The FCC estimates that 40 percent of the incidents that damage underground pipes and cables are caused by those who don't call before digging.

Site Plans

An acceptable **site plan** will show the outline of the parcel with dimensions. It will include the items listed below.

Dimensions Indicate all building dimensions.

Set-Backs Show all of the building set-back distances.

- From the property lines: front, side, and rear;
- From the road right-of-way;
- From shorelines; and
- From bluff lines.

Private Drives Show the location of private driveways and access roads.

Wells Indicate the locations of all wells.

Sewage Systems Indicate the required setbacks and the locations of any and all

- Tanks;
- Drainfields; and any
- Additional parts of all on-site septic and sewage systems.

Accessory Buildings Show the location of existing and of Proposed, accessory buildings.

Construction Plans

Deck plans will include the information listed below.
 Minimum Scale: 1/4" = 1'

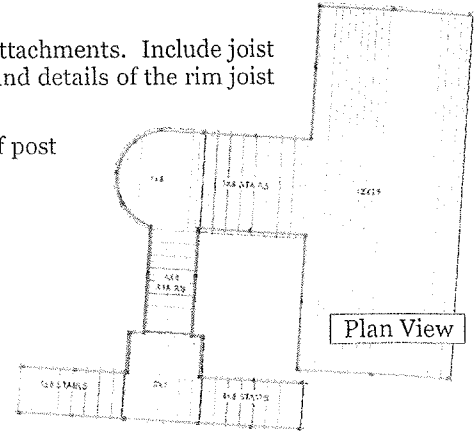
Elevation View Show the height above grade, footing system, guard height, baluster spacing, stairways, and clearances to any overhead structures.

Floor Plan Include the size, dimensions, shape, and layout of the deck; stairways; footing locations; post locations and spacing; beam, joist, and decking information; and the location of the deck relative to the house.

Structural Details Indicate post and beam sizes and details of attachments. Include joist sizes and spacing, deck board size and type, and details of the rim joist and ledger board attachments.

Footing Detail Include the size, the depth, and the spacing of post holes, and concrete pad dimensions.

Stairways / Railings Include the maximum riser height and the minimum tread measurement. Indicate handrail placement and height, guardrail height, and baluster spacing.



Plan View of Construction Drawings

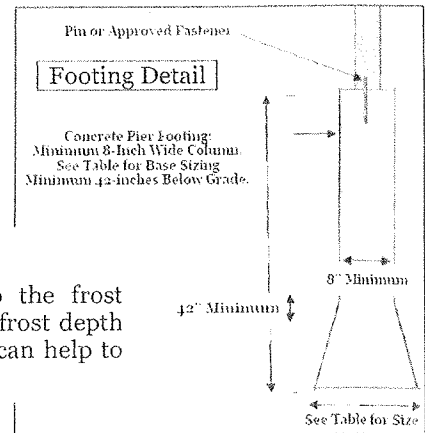
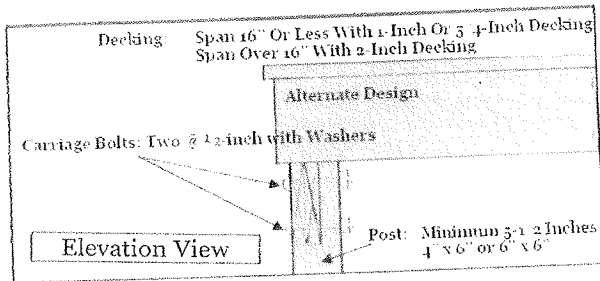
The plan view of construction drawings for a deck will typically include the following items.

- Proposed Deck Size
- Location and Size of Footing
- Size, Type, Location, and Spacing of Posts
- Size and Type of Beams
- Size and Spacing of Floor Joists
- Size and Type of Decking Material

Elevation View of Construction Drawings

The elevation view of drawings for a deck will typically include the following items.

- Height of Structure From Grade
- Size, Depth, and Details of Footings
- Guard Height and Spacing
- Stairway Rise, Run, and Handrail Height
- Clearance of Any Overhead Wires



Deck Footings

Deck footings must extend to the frost depth. In Goodhue County the frost depth is 42 inches. The tables below can help to appropriately size footings.