

Decks

An Overview of Permit and Code Requirements

City of Hopkins Inspections Division

1010 1st Street South, Hopkins, MN 55343 | 952.548.6320 | 952.935.1834 Fax | www.hopkinsmn.com

Notice: This handout is intended only as a guide to the subject matter covered herein and is based in part on the 2015 Minnesota State Building Code. While every attempt has been made to insure the correctness of this handout, no guarantees are made to its accuracy or completeness. Responsibility for compliance with applicable codes and ordinances falls on the owner or contractor. For specific questions regarding code requirements, refer to the Minnesota Building Code or contact us.

Obtaining A Building Permit

Building permits are required for decks, with the exception of freestanding decks. Building permits can be obtained from the Inspections Division by **filling out a building permit application and submitting your building plans.**

Building Plans

It is very important that your plans show exactly how your deck will be built. Plans must be neat and be of a scale of at least 1/4" = 1'. Plans must show size, location and spacing of footings, posts, beams, joists, stairs and guardrails. See checklist on page 10.

Computer generated plans from home stores are not acceptable and will be returned. Plans are reviewed for code compliance and a copy is returned to the applicant with notes to identify required corrections.

Site Plan

The site plan is a scale drawing of the lot showing the location of each building on the lot. The site plan should indicate the address of the property, the scale

Freestanding decks (decks not connected to a structure), regardless of size, do not require permits if they are not more than 30 inches above adjacent grade and are not part of an accessible route. Freestanding decks do not require footings that extend below the frost depth.

to which the drawing was prepared, and indicate the orientation of the drawing with a north arrow. The size of each building and proposed deck must be shown as well as the distance from the deck to the property lines and to other buildings. (See page 7 for sample site plan.)

Setbacks: Decks are permitted as an addition to a dwelling in a side or rear yard or as a freestanding structure. Decks must be at least three feet from a neighbor's property line and should be ten feet from a rear property line. Setbacks are routinely checked as a part of the site plan review and again at the time of the footing inspection.

Required Inspections

The Inspections Division will typically make two or three inspections of your deck during construction. Call 952-548-6320 to schedule an inspection 1-2 days before you need the inspection.

Inspection #1: Post Footings. At the time of this inspection, the holes should be dug and all loose material should be removed but no concrete should be poured. The inspector will check the depth of the footing and its width at the base.

Inspections #2 and #3: Framing and Final. These can be combined into one inspection if the underside of the deck is fully visible (such as would be the case with a bi-level home). If it will not be possible to view

the deck from below, the framing inspection should be made prior to decking being applied.

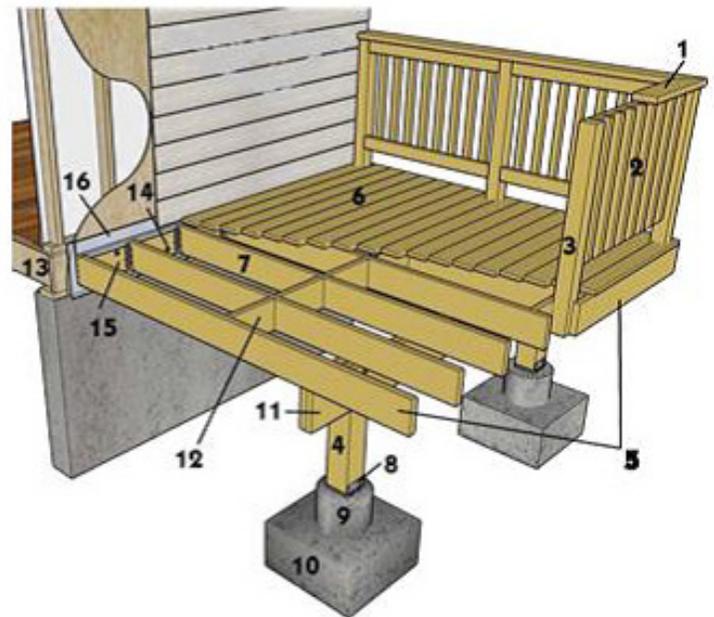
When you receive your building permit, you will receive an orange inspection record card. This should be available when the inspector arrives at the site. The inspector will sign the record card if the work is approved. This will be your authorization to proceed to the next step.

If at any time during the construction of your deck you have a question, please do not hesitate to call the Inspections Division at 952-548-6320. We will be happy to meet with you on site if necessary to help resolve any concerns or problems.



Terminology

- | | |
|------------------------|------------------|
| 1. Railtop Cap | 9. Pier |
| 2. Ballusters | 10. Footing |
| 3. Rail Post | 11. Dropbeam |
| 4. Support Post | 12. Blocking |
| 5. Rim or Band Joist | 13. House Joist |
| 6. Decking | 14. ½” Bolts |
| 7. Joists | 15. Ledger Board |
| 8. Post Base Connector | 16. Flashing |



Materials

Fasteners

Nails and other hardware must be hot-dipped zinc-coated (galvanized), stainless steel or equally well-protected material.

Screws should be either hot-dipped galvanized or electroplated with a polymer coating.

With lag screws, use a flat washer under the head.

Use washers under the nut and head of machine bolts and just under the nut of carriage bolts.

Lumber

All wood used in deck construction must be pressure treated lumber or wood that is naturally resistant to decay such as redwood or cedar.

Wood used above ground should be treated to 0.25 pcf, for ground contact to 0.40 pcf, and to 0.60 pcf for wood foundations and embedment in the ground.

Because the new preservative treatments are very corrosive, verify that any metal connectors used in the construction of your deck are approved by the manufacturer for use with treated wood.

Decking

Materials commonly used for decking include standard dimension lumber (either 2×4 or 2×6), radius-edged decking, or a manufactured decking product.

Dimension lumber that is 2×6 is the only lumber product that can be used on joist spacing of 24 inches. While lumber wider than 2×6 may be used, you may experience problems with undesirable cupping and for this reason it is recommended that decking be limited to 2×6 or smaller lumber.

Radius-edged patio decking has been specifically developed for outdoor decks. Patio decking is intended to be used flat-wise in load-bearing applications where spans do not exceed 16” on center. Its thin profile and oversized eased edges make it suitable where a stock thinner than 2” is desirable.

Manufactured decking products are available in a variety of designs, colors, and materials. Deck builders should be aware that there are some decking products on the market that are not approved and will not pass inspection. The decking supplier should be able to provide you with a listing for the deck material that indicates it has been approved by a nationally recognized testing agency. If they cannot provide a listing, you should contact the Inspection Division for approval prior to purchase. The Inspections Division maintains a list available upon request of decking materials that have been approved for use in Minnesota.



Footings

Prior to excavating for any footings, call Gopher State One Call for utility locations 2 days before you dig:

1-800-252-1166 or 651-454-0002



Footing Sizes

Footings supporting a 4x4 column must be 6-inch diameter or larger. Post footings supporting columns larger than 4x4 must be 8-inch diameter or larger. The bottom of post footings may be “belled” to achieve the desired minimum bearing area.

Deck footings should be sized according to the following table.

Deck Footing Sizes (1500 psf soils)
(NOT FOR USE WITH HOT TUBS)

Maximum Area of Deck Supported	Required Footing Diameter
10 ft ²	8 in.
13 ft ²	9 in.
16 ft ²	10 in.
19 ft ²	11 in.
23 ft ²	12 in.
27 ft ²	13 in.
32 ft ²	14 in.
36 ft ²	15 in.
41 ft ²	16 in.
47 ft ²	17 in.
53 ft ²	18 in.
59 ft ²	19 in.
65 ft ²	20 in.
72 ft ²	21 in.
79 ft ²	22 in.
86 ft ²	23 in.

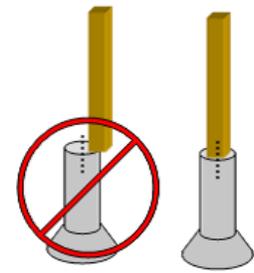
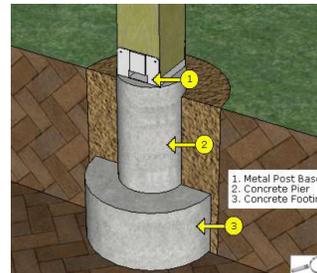
1. Based on assumed soil bearing capacity of 1500 lbs per square foot.
2. Concrete footers to be 8 inches thick minimum.
3. All dimensions are approximate.
4. For solid concrete piers greater than 12 inches in diameter, the footing area is obtained by bellling the bottom of the pier.

Depth

Footings must extend at least 42 inches below grade except for decks that are not connected to a dwelling.

Column Attachment

Center the column on the footing secured by a pin or connector. Rebar is recommended.



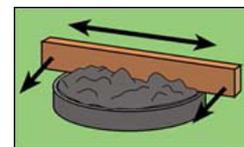
Materials

Posts imbedded in the ground must be 60% C.C.A. or equal.

The minimum compressive strength of concrete used for deck footings is 5000 psi.

The use of a fiberboard tube will allow you to elevate the top of the footing 1-2 inches above finished grade to provide protection of the wood post from lawn mowers and trimmers. The tube will also reduce the potential for frost to “heave” the post footing.

You may wish to provide a slight crown to the top of your footing to promote good drainage.



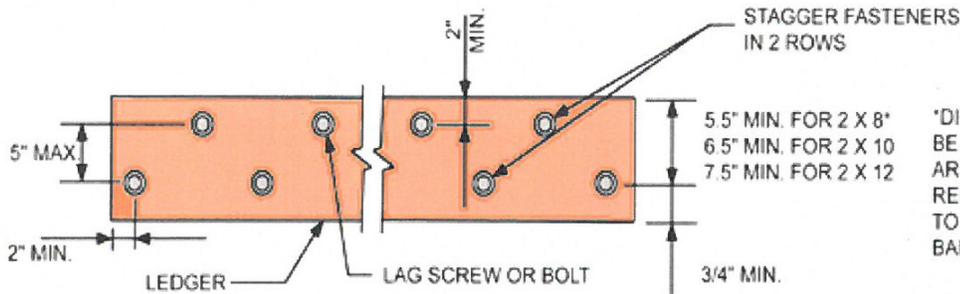


Deck Framing

Attachment of Ledger Board to Wood Joists (2x6, 2x8, 2x10, 2x12)

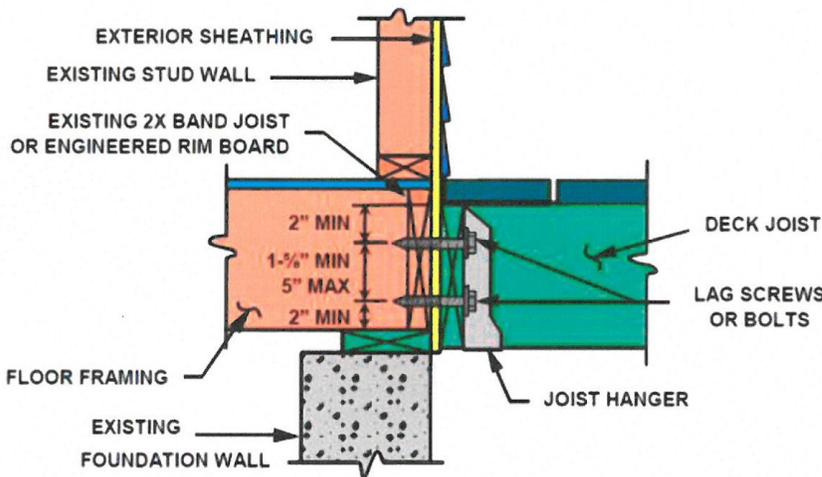
Make sure the ledger is securely attached to the dwelling. Install metal flashing at top and caulk sides.

Placement of Lag Screws and Bolts in Ledgers

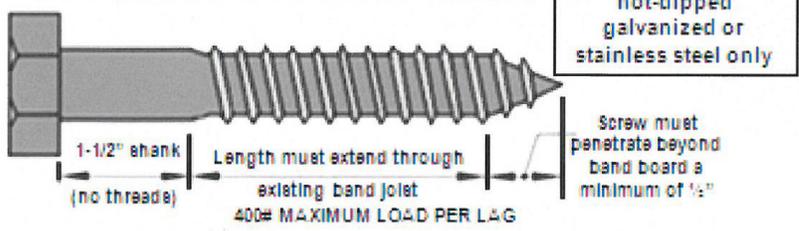


*DISTANCE SHALL BE PERMITTED TO BE REDUCED TO 4.5" IF LAG SCREWS ARE USED OR BOLT SPACING IS REDUCED TO THAT OF LAG SCREWS TO ATTACH 2 X 8 LEDGERS TO 2 X 8 BAND JOISTS.

Placement of Lag Screws and Bolts in Band Joists



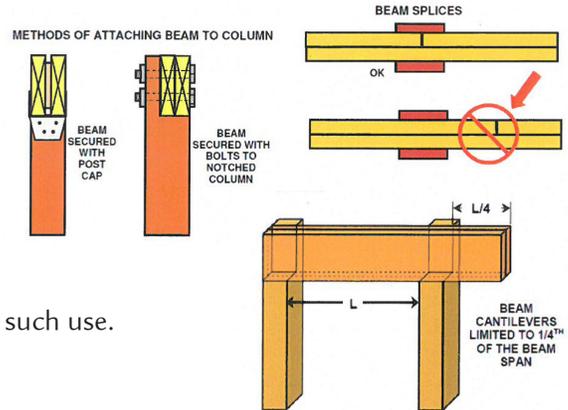
1/2" DIAMETER LAG SCREWS MINIMUM





Beams

- Construct beams using two or more 2-inch nominal pieces of lumber.
- Nail beams together using 10d nails at 32 inches OC along each edge of the beam and staggered.
- A spacer may be used to fit the beam to a 3½-inch width.
- Beams should be installed with any arch or crown facing up.
- Attachments to columns should be with post caps designed for such use.
- Splices must occur over columns.



BEAM SPANS (Wet Service)								
Species	Beam Size	Joist Spans (center of one column to center of next)						
		6'	8'	10'	12'	14'	16'	18'
Southern Pine	2 - 2×6	7'11"	6'2"	5'6"	5'0"	4'8"	4'4"	4'1"
	2 - 2×8	9'2"	7'11"	7'1"	6'6"	6'0"	5'7"	5'3"
	2 - 2×10	11'10"	10'3"	9'2"	8'5"	7'9"	7'3"	6'10"
	2 - 2×12	13'11"	12'0"	10'9"	9'10"	9'1"	8'6"	8'0"
	3 - 2×6	8'7"	7'8"	6'11"	6'3"	5'10"	5'5"	5'2"
	3 - 2×8	11'4"	9'11"	8'11"	8'1"	7'6"	7'0"	6'7"
	3 - 2×10	14'5"	12'10"	11'6"	10'6"	9'9"	9'1"	8'7"
	3 - 2×12	17'5"	15'1"	13'6"	12'4"	11'5"	10'8"	10'1"
Cedar, Redwood, Ponderosa Pine	2 - 2×6	5'5"	4'8"	4'2"	3'10"	3'6"	3'1"	2'9"
	2 - 2×8	6'10"	5'11"	5'4"	4'10"	4'6"	4'1"	3'8"
	2 - 2×10	8'4"	7'3"	6'6"	5'11"	5'6"	5'1"	4'8"
	2 - 2×12	9'8"	8'5"	7'6"	6'10"	6'4"	5'11"	5'7"
	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"

Source: AF&PA; rev. 8-17-10

Posts

Minimum Post Sizes					
Height	Load Area = beam spacing × post spacing				
	48 ft ²	72 ft ²	96 ft ²	120 ft ²	144 ft ²
Up to 6'	4×4	4×4	6×6	6×6	6×6
Up to 8'	6×6	6×6	6×6	6×6	6×6

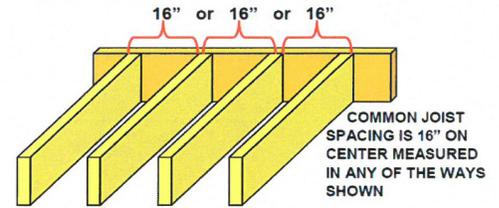
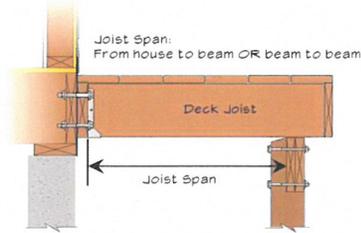
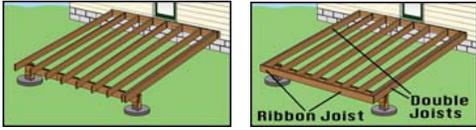
- Vertical loads figured as concentric along axis.
- 6×6 posts require a minimum 8-inch diameter footing.

continue to next page



Joists

Joist Spans and Spacing



Joist spacing is determined by the type of decking used. 16" o.c. spacing must be used with 5/4 decking or when 2x6 or 2x4 decking is used at a 45° angle. 12" o.c. spacing required when 5/4 decking is used at a 45° angle.

JOIST SPANS (Wet Service)

Species	Joist Size	Joist Spacing		
		12" oc	16" oc	24" oc
Southern Pine	2x6	10'4"	9'5"	7'10"
	2x8	13'8"	12'5"	10'2"
	2x10	17'5"	15'10"	13'5"
	2x12	21'2"	18'10"	15'5"
Western Cedar/ Ponderosa Pine	2x6	8'10"	8'0"	7'0"
	2x8	11'8"	10'7"	8'8"
	2x10	14'11"	13'0"	10'7"
	2x12	17'5"	15'1"	12'4"

Joist Details

Unless joists bear on a beam or ledger strip, they must be supported by **joist hangers**. Joist hangers must be installed in accordance with the manufacturer's recommendations.

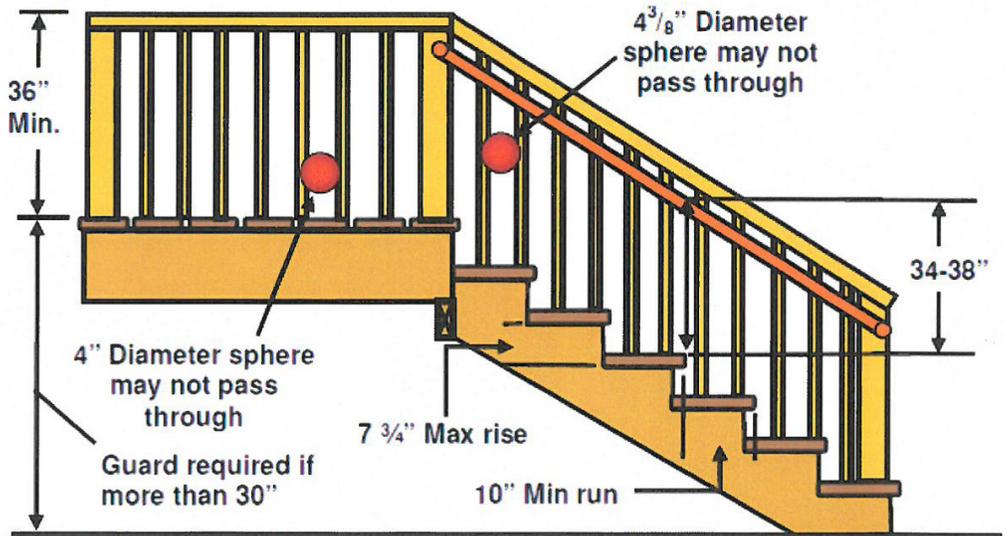
Joists should be installed with the crown side up.

For high decks, additional lateral bracing is required and is usually installed in the form of a 2x4 or 2x6 that is nailed or screwed diagonally across the bottom of the deck.

Railings

Guardrails are required for decks 30" or more above grade.

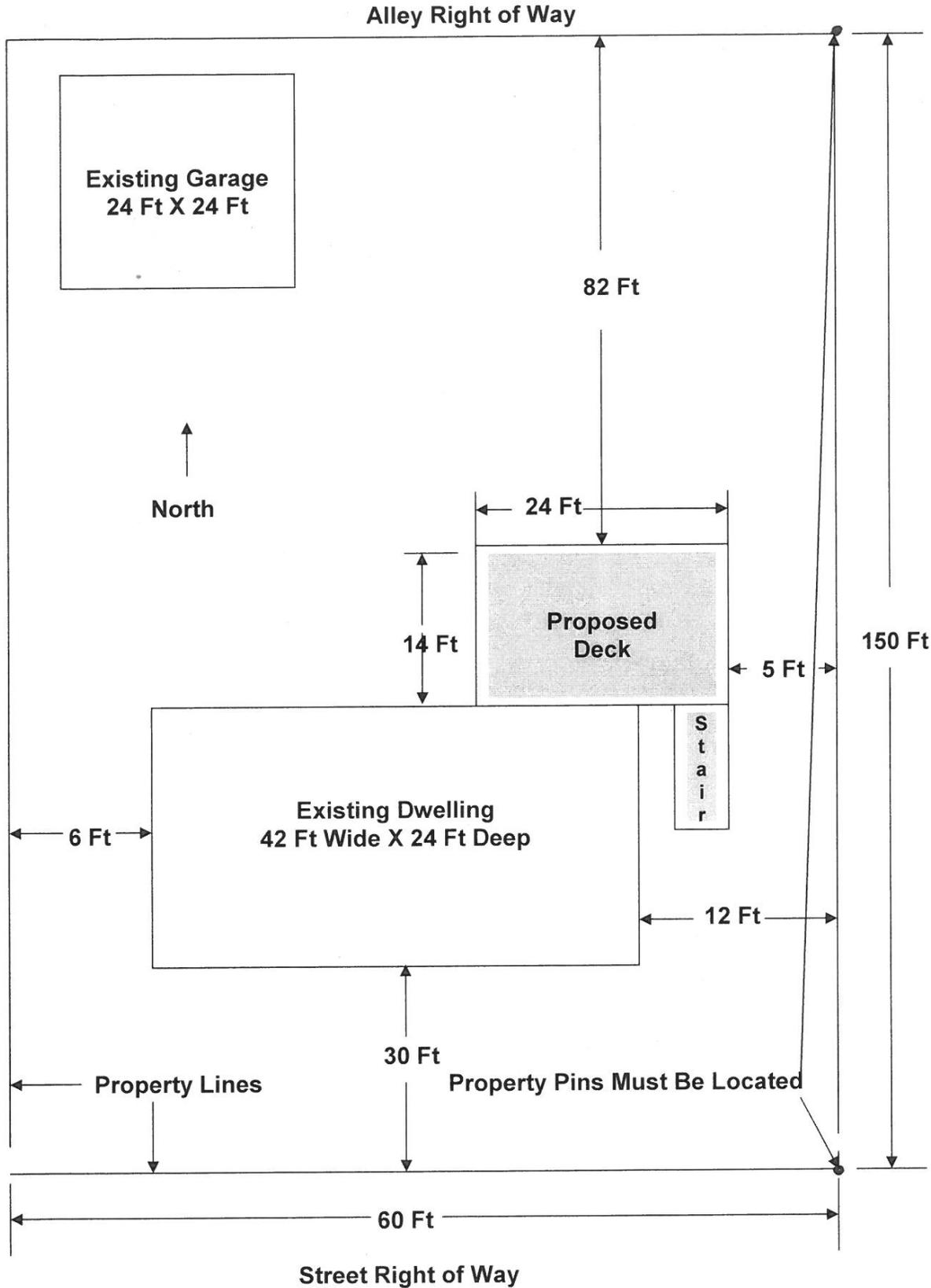
- The height of the rail must be a minimum of 36".
- Open guardrails must have intermediate rails or ornamental pattern that a 4" sphere cannot pass through.
- Guardrails must continue down stairs where the stair is more than 30 inches above grade.





Sample Site Plan for Proposed Deck

Scale 1" = 10'

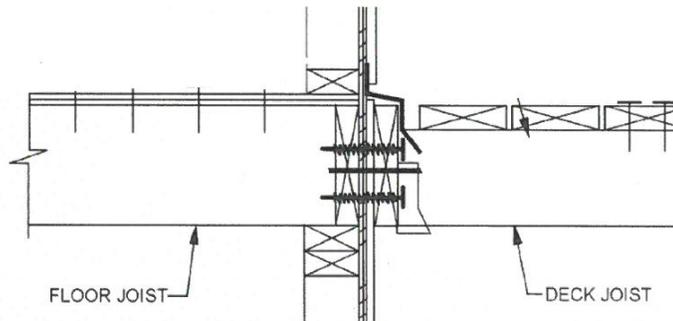
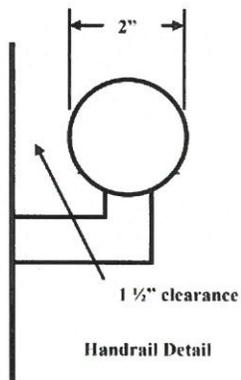
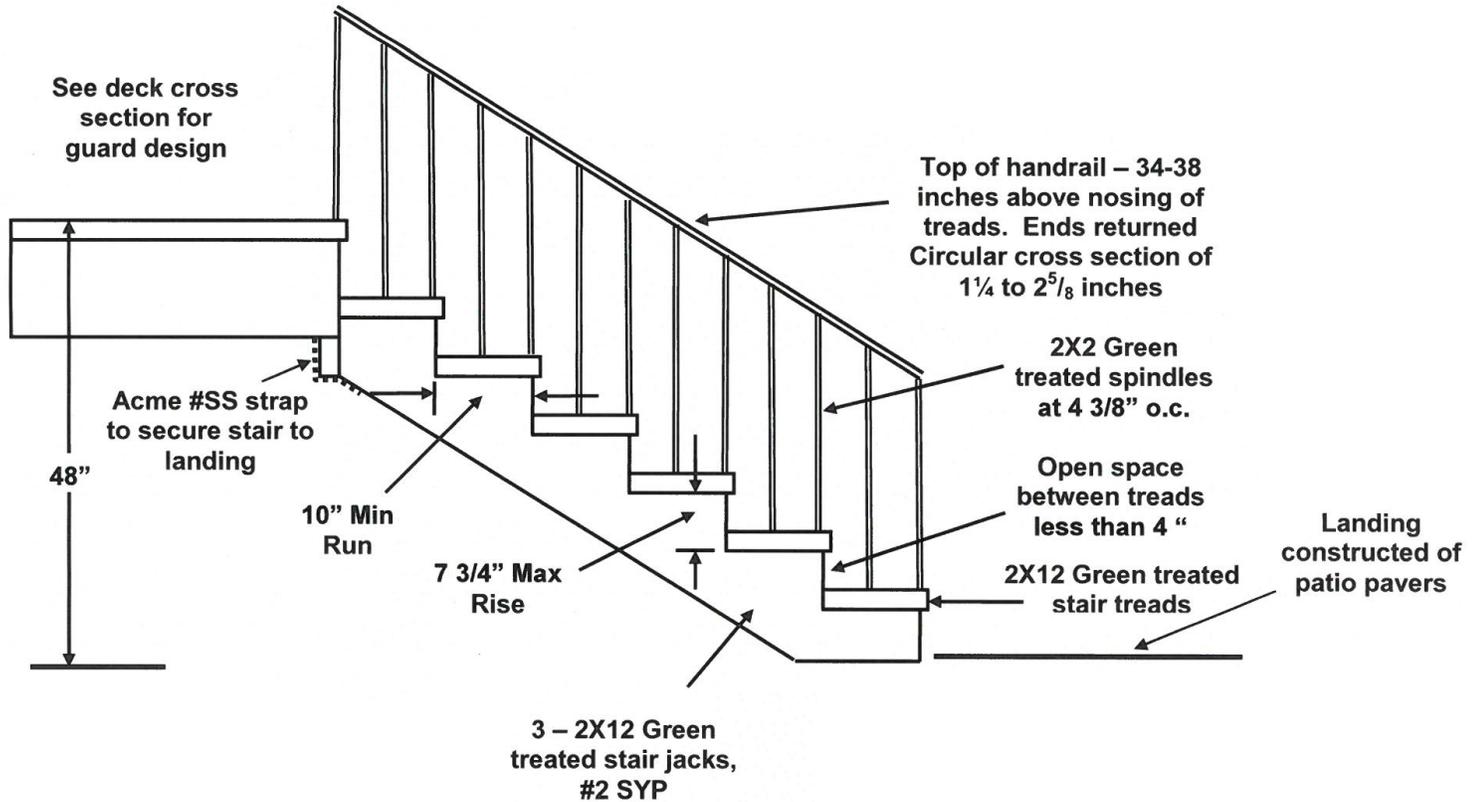




Typical Stair Framing Detail

Stair framing details show rise/run compliance, guard and handrail compliance, connections, materials used, and general stair design.

Scale 1/2" = 1'



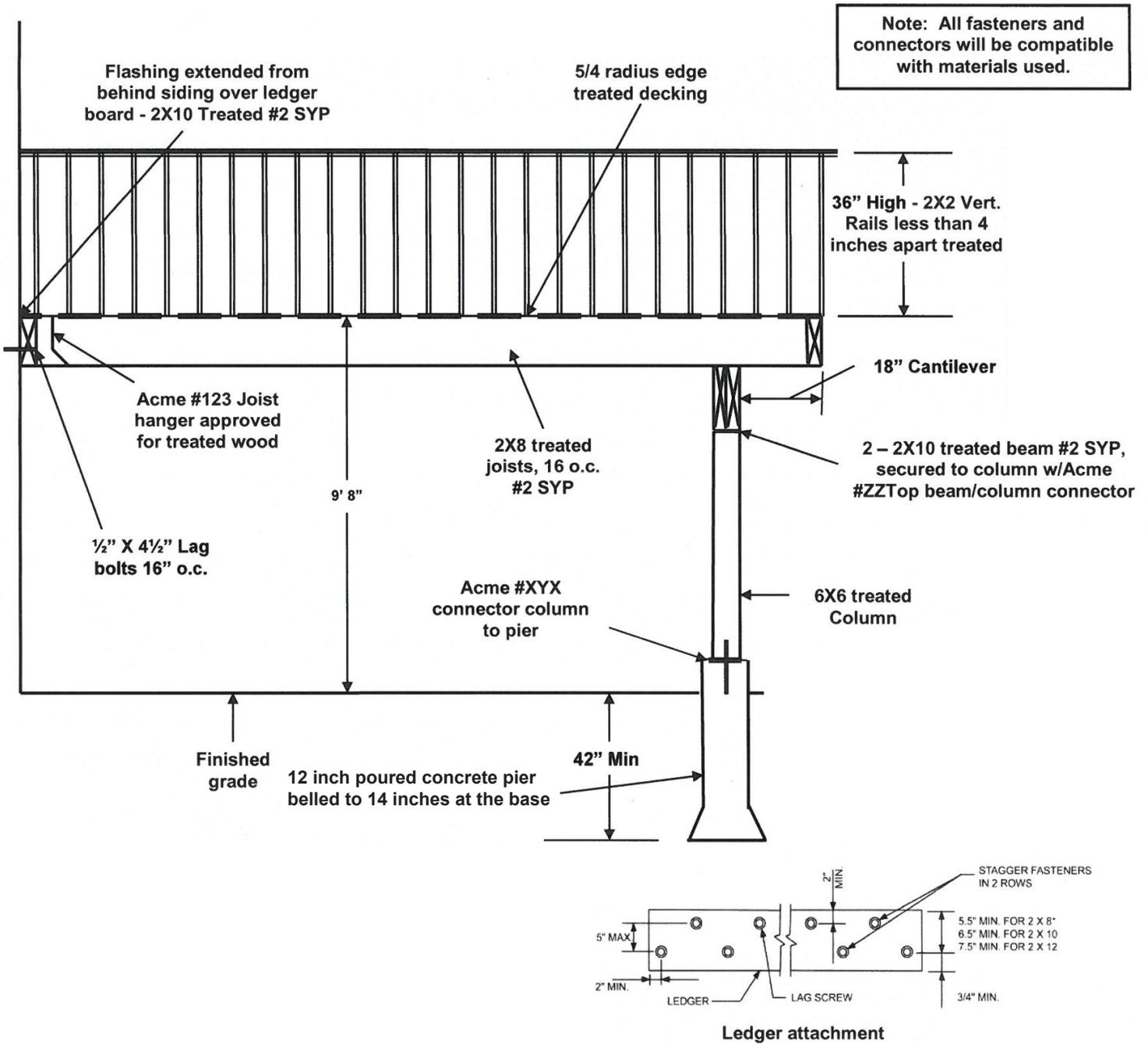
Warning: This is an illustration only. It is intended to show some of the information that should be included on your deck plans. It is not intended to show compliance with any codes that may apply. Changes in the height and size of a deck will cause variations in the code requirements.



Typical Deck Cross Section

Cross sections provide information on the height above grade of a deck, details about guards and certain framing elements, some footing information, and a general overview of the deck construction.

Scale 1/2" = 1'



Warning: This is an illustration only. It is intended to show some of the information that should be included on your deck plans. It is not intended to show compliance with any codes that may apply. Changes in the height and size of a deck will cause variations in the code requirements.



Checklist for Deck Plans

Site Plan

- Street address and/or legal description shown
- North arrow shown
- Plan drawn to useable scale and scale used shown
- Size of existing buildings shown
- All lot dimensions and pin locations shown
- Location and size of proposed deck shown
- Distance to all lot lines from existing buildings and proposed deck

Construction Plans

- Plans drawn to useable scale
- Scale indicated on plan
- Plan neat and legible

Elevation

(This could be illustrated on section drawings)

- Show side and front view of deck in relation to grade and dwelling
- Include railing height and design

Framing Plan

- Floor joist size and spacing including species and grade
- Orientation of floor joists
- Cantilever of joists
- Bearing points for all joists
- Size and location of all beams including species and grade
- Cantilever of beams
- Size and location of ledger board including species and grade
- Size and location of all columns including species and grade
- Track all floor loads thru beams to columns to footings
- Location of stairs
- Changes in elevation of deck floors or landings
- Unusual framing issues such as cantilevers of the dwelling floor

Ledger Details

- Framing method, orientation of existing dwelling floor framing.
- Method of meeting lateral load connection requirements
- Spacing, location, & type of bolts or lags used to attach ledger.

Footings

(This information may be included on section or framing plans)

- Footing depth and design
- Footing width at base consistent with load for each footing location.

Section(s)

- Section view(s) from bottom of footing to top of guard to show railing details; floor framing orientation; joist/beam orientation and bearing; column locations; connections; footing design, size, and depth; and height of deck floor above grade.

Details

- Flashing at the ledger
- Joist bearing/hangers
- Ledger connection (Caution for dwelling floor cantilevers)
- Fasteners/connectors consistent with lumber and decking used
- Column/beam connection
- Column/footing connection
- Type of decking and orientation (Caution for 5/4 or composite decking for spans more than 16" o.c. or installed diagonally)
- Research report required for decking other than wood
- Stair stringer connection
- Lateral bracing

Stairs

- Width of stairs
- Rise/run w/tolerance shown
- Number and size of stringers
- Open riser design
- Type and size of tread consistent with stringer spacing (Caution for decking use)
- Connection method for treads to stringers
- Handrails shown for stairs with 4 or more risers
- Handrail height shown on plan
- Handrail profile detailed
- Landing at bottom of stair
- Show any doors or windows adjacent stairs and landings.

Guards

- Guard height and opening dimensions
- Guard design/materials
- Guard attachment

