

BUILDING A DECK



To Schedule Inspections, Call: 763-479-0527

For Building Department questions, email:
bsatek@ci.independence.mn.us



This handout is intended only as a guide and is based in part on the 2020 Minnesota Residential Code (MRC), the City of Independence ordinances, and good building practice. 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 MRC section 507, Exterior Decks, or contact your local Building Department.

BUILDING PERMITS

Building permits are required for decks with the following exception: freestanding decks, regardless of size, if they are not more than 30 inches above adjacent grade. Freestanding decks do not require footings that extend below the frost depth.

Building permits are not required for patios made of concrete or pavers on grade.

Building permits can be applied for by going to <https://www.ci.independence.mn.us/departments/building-inspector> and selecting "Apply for a Building Permit" and upload your building plans. Building permits are typically processed within 5 business days of receiving a complete set of plans.

PERMIT EXPIRATION

If you suspend work on your deck for more than 180 days since permit issuance or your last inspection, your permit will expire. If unforeseen circumstances delay construction, contact the Building Department **before** your permit expires.

PLANS

The Building Department has a handout illustrating what needs to be included on deck plans. It is very important that your plans depict exactly how your deck will be built. Plans must be neat and to a scale of at least $\frac{1}{4}" = 1'$. Plans are reviewed for code compliance and then the applicant will receive an email notification to access any required corrections. **PLEASE REVIEW THE PLANS WHEN THEY ARE RETURNED TO YOU SO THAT YOU WILL BE AWARE OF ANY CORRECTIONS NEEDED.** The City only maintains plans for one year after completion of a residential deck. You may wish to retain a copy of your approved plans, permits, and inspection record cards for any future needs.

INSPECTIONS

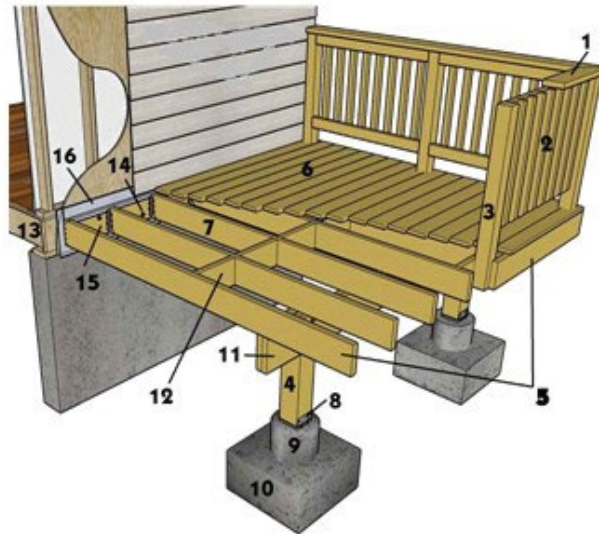
1. Call at least 2 days in advance.
2. Have address, permit number, and type of inspection (ex. footing) ready.
3. Let scheduler know if you wish an exact time.
4. Footing Inspection - Holes dug, loose material/water removed. **Plans and record card on-site.**
5. Framing Inspection – Framing completed and materials visible. **Plans and record card on-site.**
6. Final Inspection - All work complete and all stairs, handrails, and guards in place.
Plans and record card on-site. Installation instructions for composite decking on site.
7. If work is approved, the inspector will sign the record card and you may proceed with the next step.
8. If corrections are noted, a correction notice will be left on the site. If a re-inspection is required, it will be noted on the notice.

Please do not hesitate to call the Building Department at 763-479-0527 if you have questions.

If necessary, we will be happy to meet with you on the site to help resolve any concerns or problems.

TERMINOLOGY

1. RAIL TOP CAP
2. BALLUSTERS
3. RAIL POST
4. SUPPORT POST
5. RIM OR BAND JOIST
6. DECKING
7. JOISTS
8. POST BASE CONNECTOR
9. PIER
10. FOOTING
11. DROP BEAM
12. BLOCKING
13. HOUSE JOIST
14. ½" BOLTS
15. LEDGER BOARD
16. FLASHING



THINK YOU MIGHT ENCLOSE YOUR DECK IN THE FUTURE?

Deck plans are approved on the assumption that the deck will be used only as a deck for the life of the structure. Because footing sizes, setbacks, structural supports, and a host of other deck components are different for enclosed spaces than they are for decks, it is important that you indicate on your plans the desire to convert the deck at a future date. You should then design your deck to carry future loads and meet setbacks and other rules.

ZONING REGULATIONS

Decks are permitted as an addition to a dwelling in a side or rear yard or as a freestanding structure. Setbacks are routinely checked as a part of the plan review and again at the time of the footing inspection. ***Easements, wetland buffers and other lot restrictions may require greater setbacks than permitted by the zoning ordinance.*** The most restrictive setback applies.

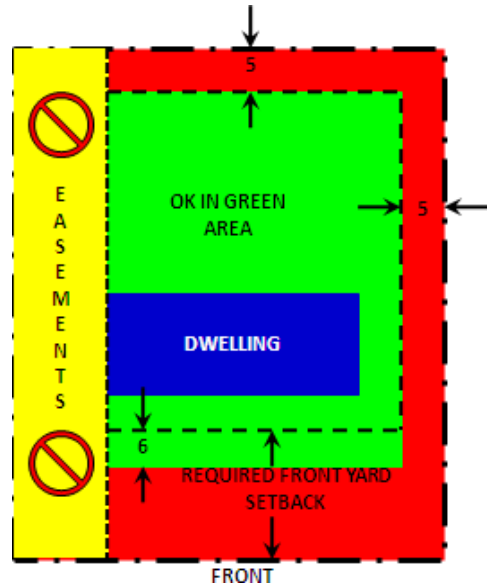
Contact the City of Independence regarding any zoning regulation questions.

SURVEY MARKER EXAMPLES



SETBACKS

- Decks can never be in an easement.
- Decks are required to meet all applicable setbacks per City ordinance.
- Decks with roofs (or proposed roofs) must meet the setback requirements for the dwelling.



Call Gopher State One Call for utility locations at least two working days before you dig.
1-800-252-1166 or 651-454-0002.



MATERIALS

Fasteners

Nails and other hardware must be hot-dipped zinc-coated (galvanized), stainless steel or equal. Screws should be either hot-dipped galvanized or electroplated with a polymer coating. 12d nails are recommended on nominal 2-inch decking. 10d nails are recommended for 5/4" decking.

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 No. 2 grade or better, preservative-treated lumber or approved, naturally durable lumber that is naturally resistant to decay such as redwood or cedar.

Wood used above ground, in contact with the ground, or below ground requires different degrees of treatment. Check the labels of the material you are buying to determine where it can be used.

Because some preservative treatments are very corrosive, make sure that any fasteners or 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 2X4 or 2X6), radius-edged decking, or a plastic composite decking product.

Plastic composite decking products may only be used when meeting ASTM D 7032 or when approved by the Building Department. Approval is based on the material carrying an ICC Evaluation Services Report. Decking without a report will not be approved. Ask the decking supplier to provide you with a copy of the research report. ***Caution – some manufactured deck products are approved for decking but not for stair treads. In some cases where manufactured decking is approved for stairs, the spacing of supports may be significantly reduced compared to use on the deck itself. Read the research report for further information.***

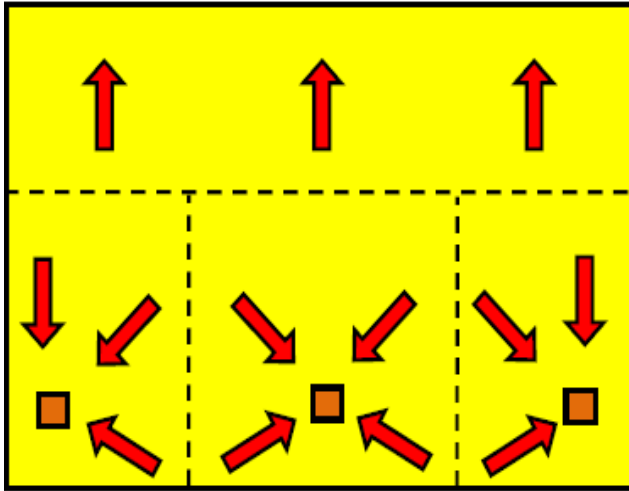
Maximum Joist Spacing for Decking		
Decking Material Type and Nominal Size	Maximum On-Center Joist Spacing	
	Decking perpendicular to joist	Decking diagonal to joist (a)
1 1/4" thick wood	16"	12"
2" thick wood	24"	16"
Plastic composite	In accordance with section R507.2	In accordance with section R507.2

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

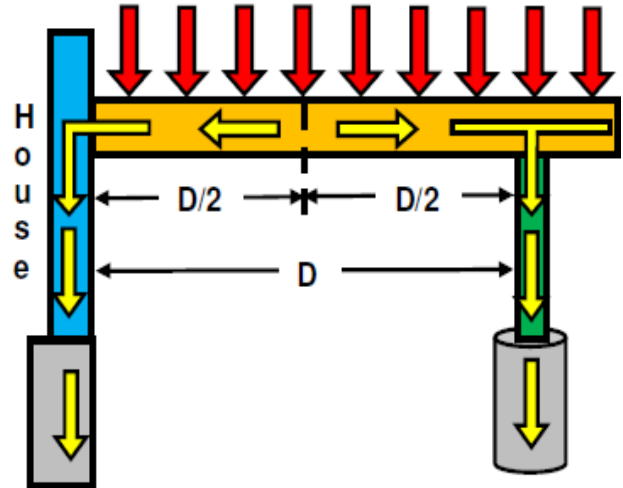
FOOTINGS

Footings supporting a 4x4 column must be not less than 6-inch diameter. 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. The base of the footing must be at least 42 inches below finished grade. Rebar is recommended. Center the column on the footing secured by a pin or connector. Posts imbedded in the ground must be 60% C.C.A. or equal. Using a fiberboard tube will allow elevation of the top of the footing above finished grade to provide protection of the wood post from lawn mowers and trimmers.

UNDERSTANDING LOAD PATHS



Loads are assumed to be uniform across the floor



Required footing sizes are determined by calculating the area of the deck supported by each footing. Loads shall be assumed to be equally shared between the supporting elements. ***Don't overlook cantilevers. The minimum compressive strength of concrete used for deck footings is 5000 psi.***

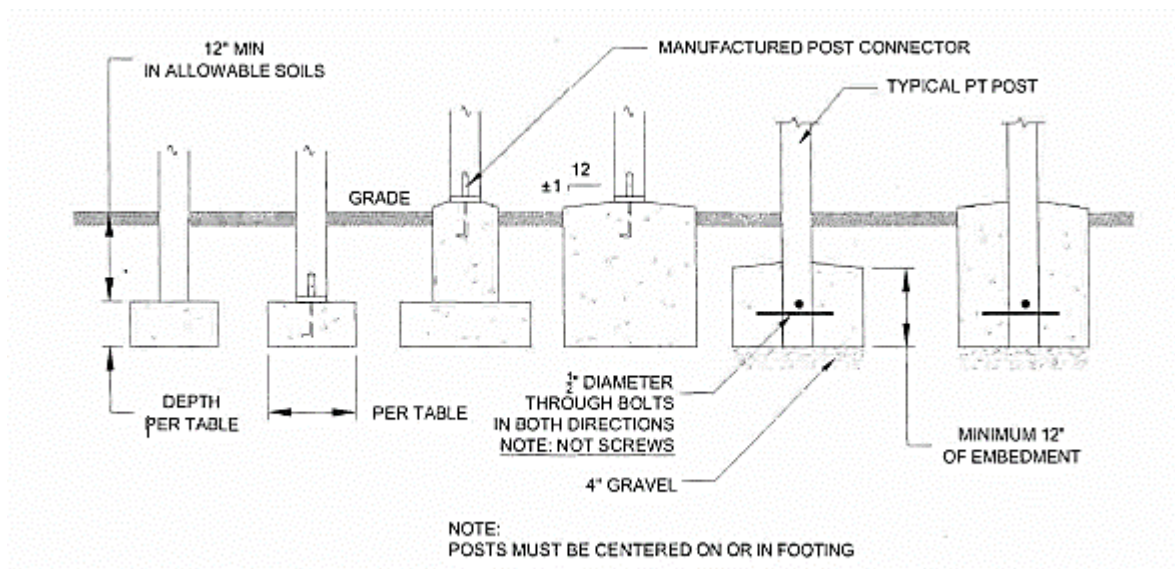
Deck footings should be sized according to the following table. Footings must extend ***at least 42 inches below grade*** (frost line) except for decks that are not connected to a dwelling. ***The minimum compressive strength of concrete used for deck footings is 5000 psi.***

Minimum Footing Size for Decks (1500 psf soils) - Not for use with Hot Tubs				
Live Load(b) (psf)	Tributary Area (sq.ft.)	1500(a)		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness (inches)
40	20	12	14	6
	40	14	16	6
	60	17	19	6
	80	20	22	7
	100	22	25	8
	120	24	27	9
	140	26	29	10
	160	28	31	11

(a) Area, in square feet, of deck surface supported by post and footings.

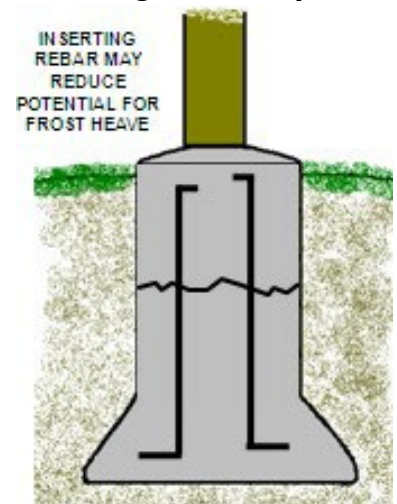
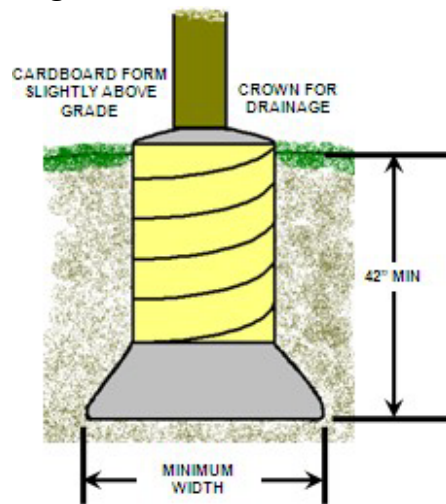
The minimum compressive strength of concrete used for deck footings is 5000 psi.

THE REQUIRED AREA OF THE COLUMN SHOULD FULLY BEAR ON THE FOOTING

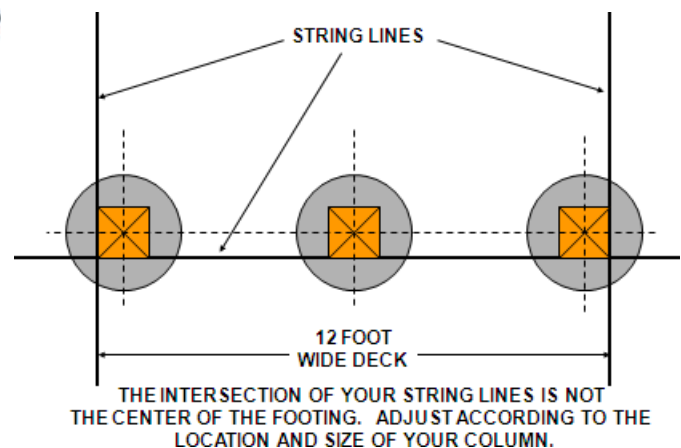
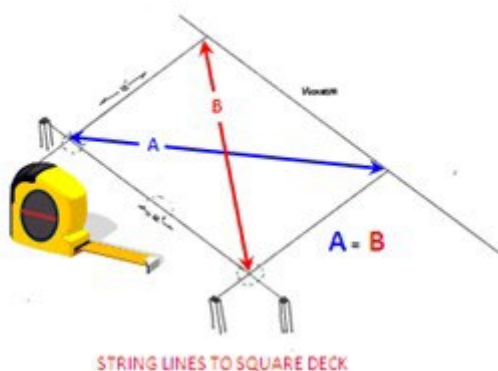


Deck Post to Deck Footing Connection

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



WHERE DO I PUT MY FOOTINGS?



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.

TABLE R507.9.1.3(1)
DECK LEDGER CONNECTION TO BAND JOIST^a
(Deck live load = 40 psf, deck dead load = 10 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 ^{b,c}	30	23	18	15	13	11	10
1/2-inch diameter bolt with 1/2-inch maximum sheathing ^c	36	36	34	29	24	21	19
1/2-inch diameter bolt with 1-inch maximum sheathing ^d	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.

a. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.

b. The tip of the lag screw shall fully extend beyond the inside face of the band joist.

c. Sheathing shall be wood structural panel or solid sawn lumber.

d. 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 ^b	1/4 inch	2 inches ^b	1 1/8 inches ^b
Band Joist ^c	3/4 inch	2 inches	2 inches ^b	1 1/8 inches ^b

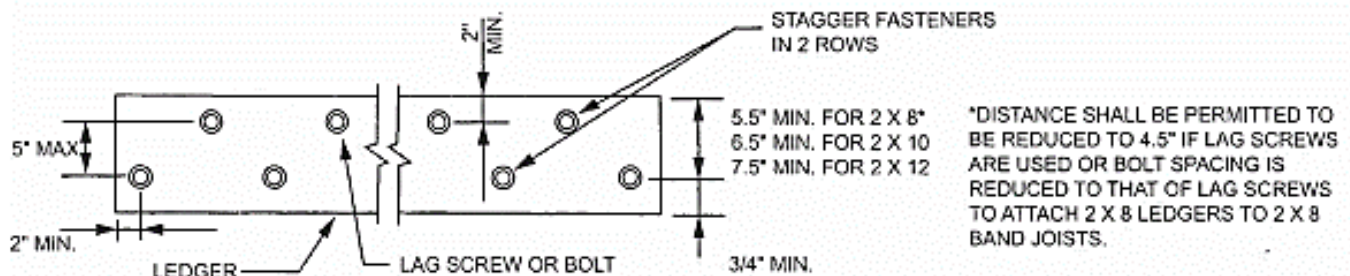
For SI: 1 inch = 25.4 mm.

a. 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).

b. Maximum 5 inches.

c. For engineered rim joists, the manufacturer's recommendations shall govern.

d. 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).



For SI: 1 inch = 25.4 mm.

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

PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS

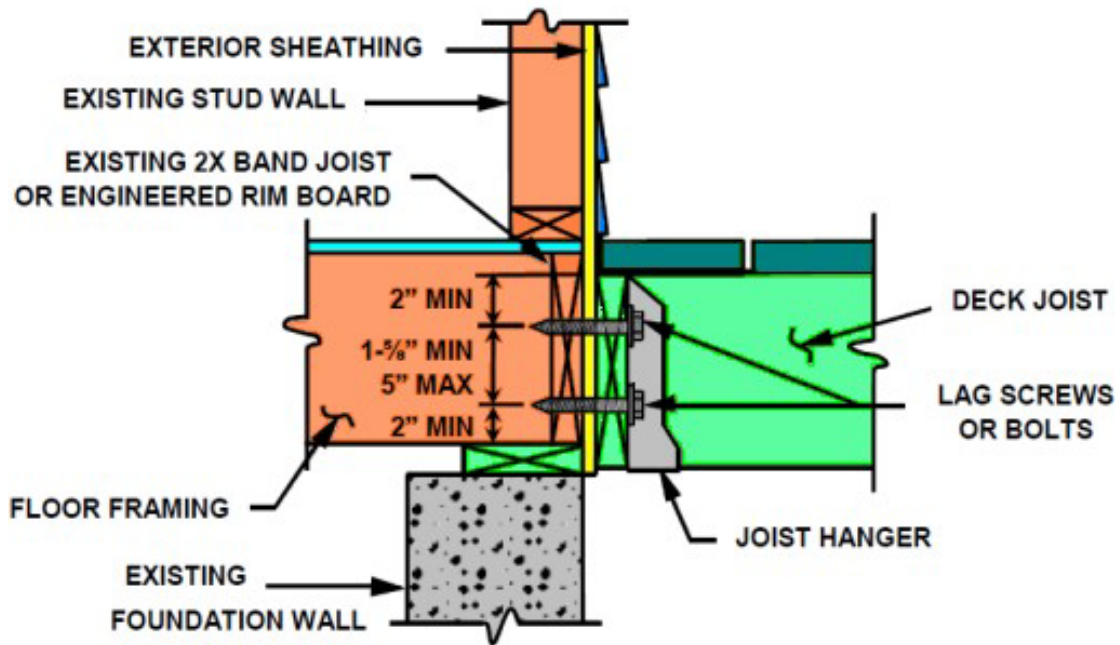
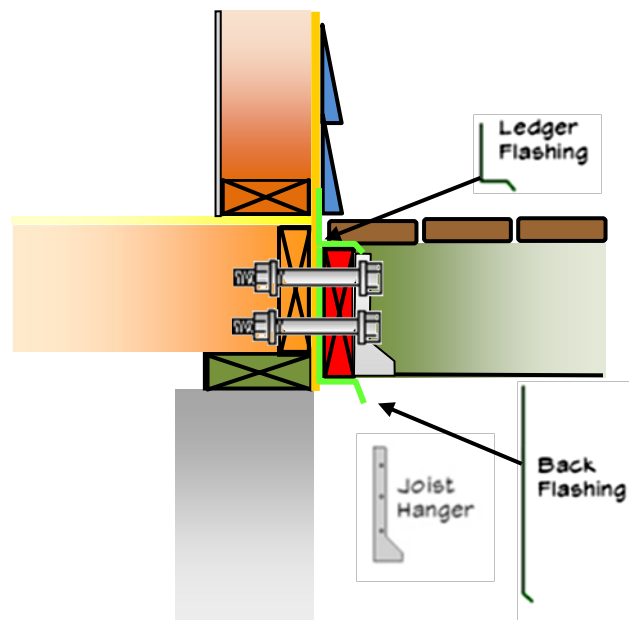
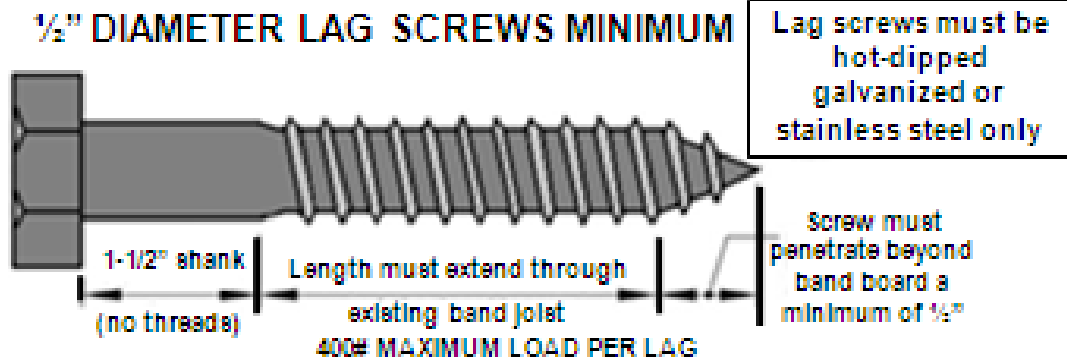
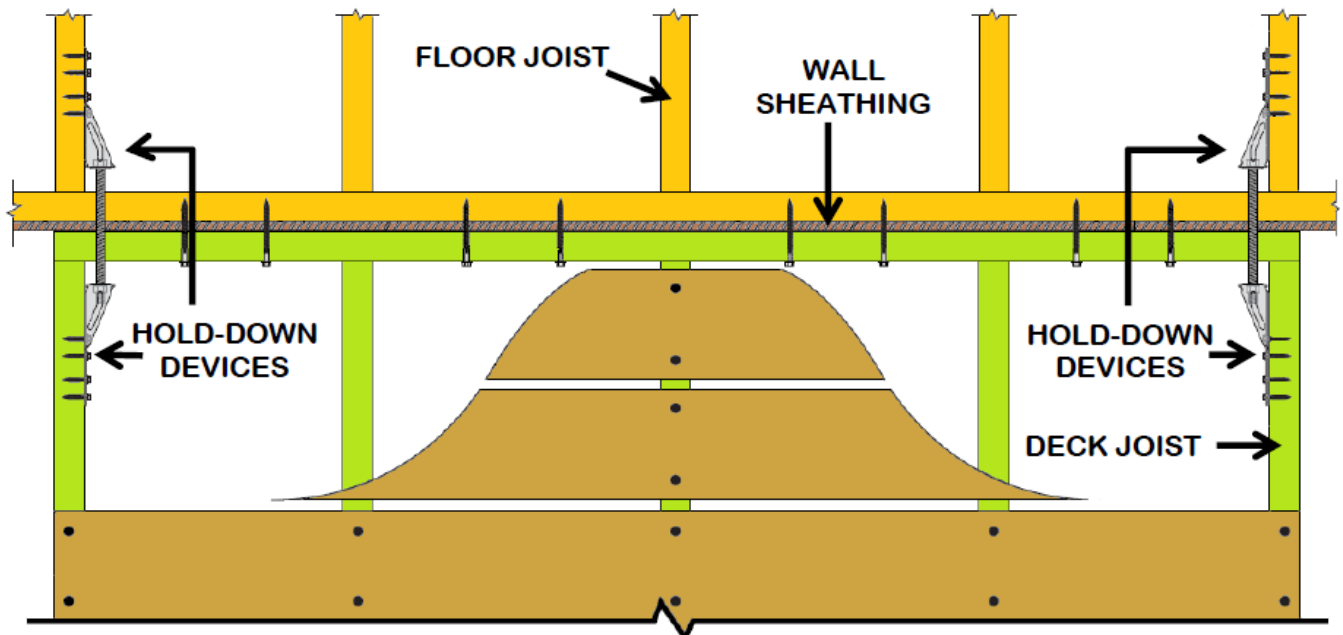


Figure R507.9.1.3(2)



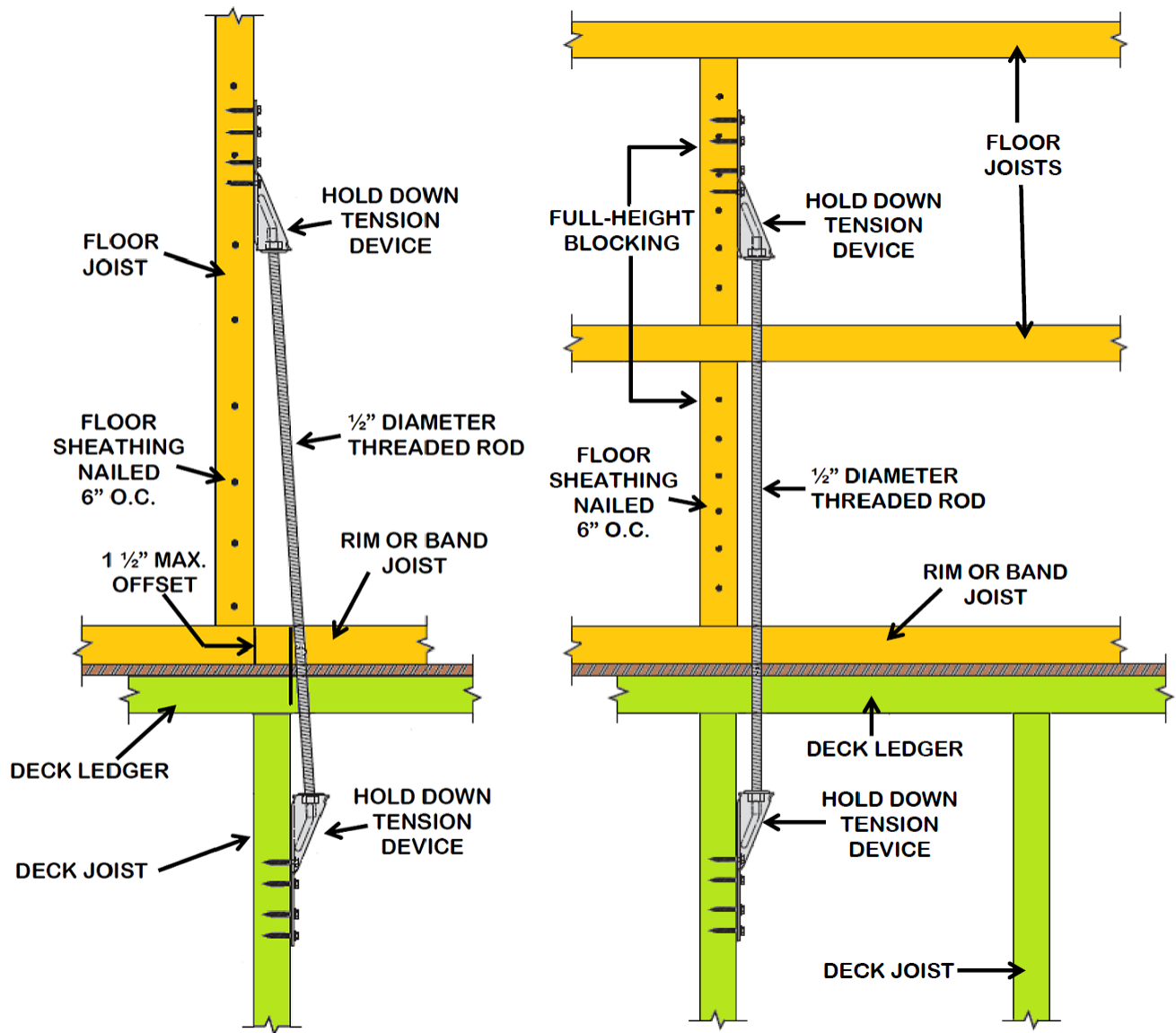
LATERAL LOAD CONNECTIONS TWO MINIMUM PER DECK



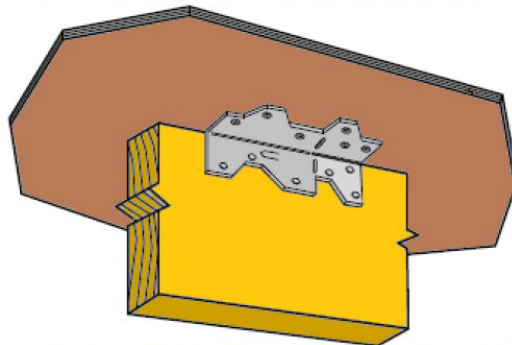
- HOLD-DOWN TENSION DEVICES MUST BE INSTALLED IN NOT LESS THAN TWO LOCATIONS PER DECK
- EACH DEVICE MUST HAVE AN ALLOWABLE STRESS DESIGN CAPACITY OF NOT LESS THAN 1500 POUNDS.
- FLOOR SHEATHING IN THE DWELLING MUST BE NAILED TO THE JOISTS TO WHICH HOLD DOWNS ARE CONNECTED AT 6" MAXIMUM O.C.
- ALTERNATIVELY THE DECK MAY BE DESIGNED TO BE SELF SUPPORTING OR A DESIGN MAY BE PROVIDED BY A LICENSED DESIGN PROFESSIONAL.

**FLOOR JOISTS
PERPENDICULAR TO DECK
LEDGER**

**FLOOR JOISTS
PARALLEL TO DECK
LEDGER**



WHEN THERE IS NO ACCESS TO THE TOP OF THE FLOOR SHEATHING



INSTALL APPROVED CONNECTORS PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS

IN ALL CASES, MANUFACTURE'S INSTALLATION INSTRUCTIONS MUST BE FOLLOWED

New DTT1Z Deck Tension Tie Provides Alternate Approach to Attaching Decks to Homes

The new DTT1Z deck tension tie provides a less invasive approach for attaching a new deck to a home or retrofitting an existing deck to current code standards. This tension tie addresses a 2015 International Residential Code provision (section R507.2.4) that now allows four 750 lb. lateral connectors to be fastened to framing in the house with a lag screw. This provision is an alternative to using two 1,500 lb. lateral connections from the deck to the floor joists within the house.

The DTT1Z is specifically designed to comply with this new code detail that permits the lateral connection from the deck joists to be made to top plates, studs, or headers within the supporting structure. This eliminates the need to access the floor joists inside the house.

The DTT1Z fastens to the narrow or wide face of a single 2x with Strong-Drive® SD Connector screws. The new Strong-Drive® SDWH Timber-Hex HDG screw with an integral washer attaches the tension tie to the supporting structure.

Additional Features

- ZMAX® coating offers additional corrosion protection for exterior and preservative-treated wood applications
- DTT1Z offered as an individual part or as part of a retail pack with Strong-Drive® SD Connector Screws and SDWH Timber-Hex HDG Screws

Additional Fastening Options

To Joist:

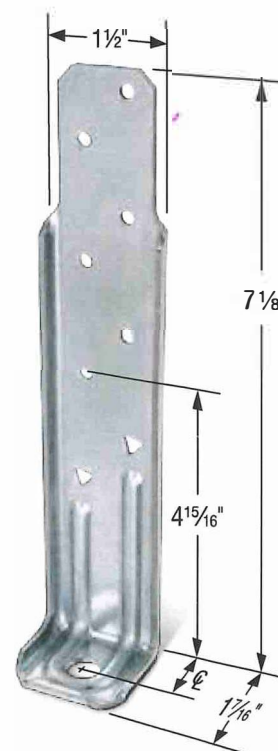
- #9x1½" Strong-Drive® SD Connector Screw
- 10dx1½" HDG nail

To Structure:

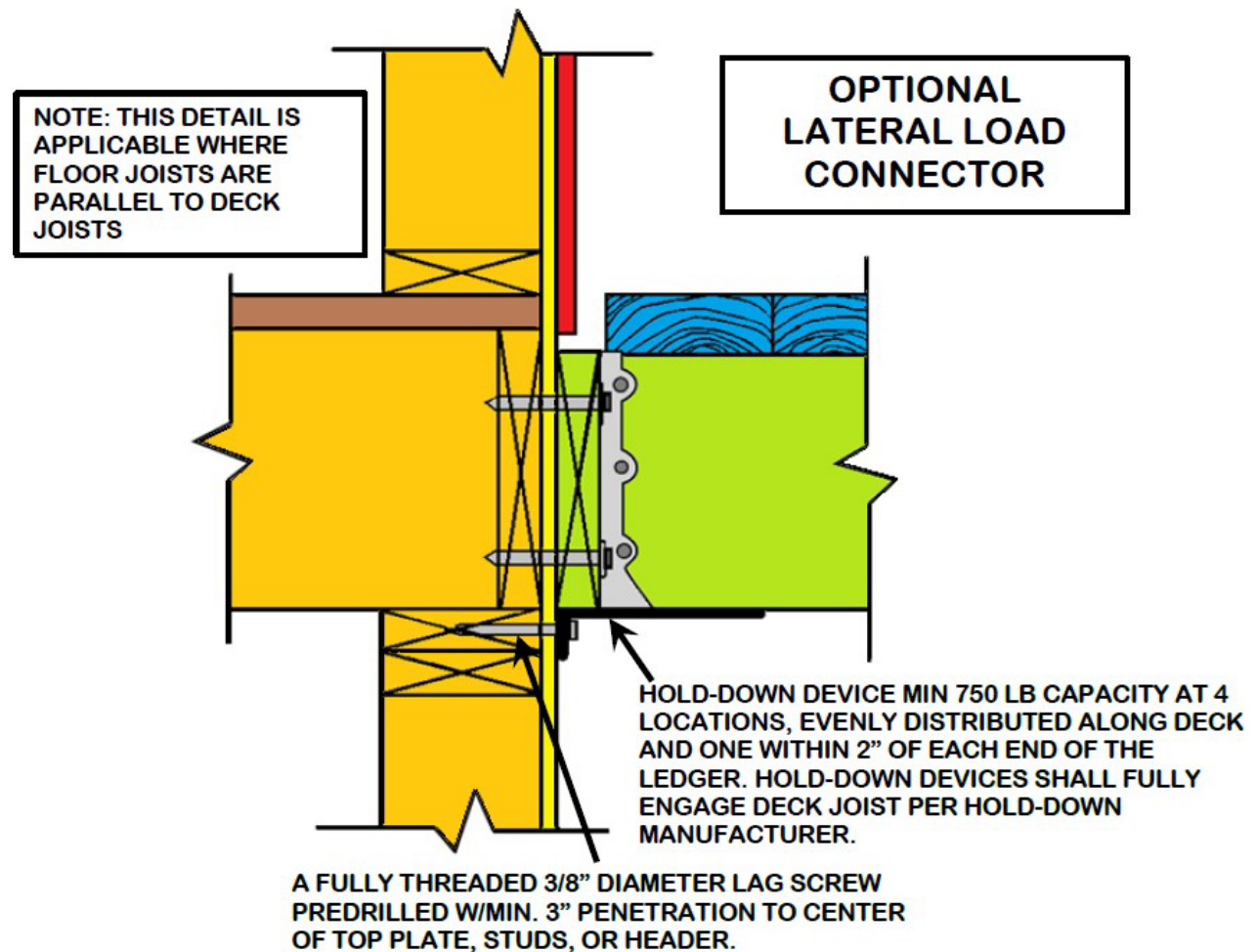
- Strong-Drive® SDWH Timber-Hex HDG Screw (available in 4" - 12" lengths)
- ⅜" machine bolt, anchor bolt or lag screw (washer required)
- ⅜" Titen® HD Heavy Duty screw anchor (interior dry holdown applications only, see page 4)

Model No.	¢	Anchor Dia. or Type	Fasteners	Allowable Tension Loads (lbs.) (160)				Deflection at Allowable Load (in.)
				Dry		Wet		
				DF/SP	SPF/HF	DF/SP	SPF/HF	
DTT1Z	¾"	⅜ ⁵ or SDWHG ⁶	6-SD #9x1½"	840	840	840	755	0.170
			6-10dx1½"	910	640 ⁴	795	640 ⁴	0.167
			8-10dx1½"	910	850	910	850	0.167

1. Allowable loads have been increased 60% for wind or earthquake loading with no further increase allowed.
2. Dry values are applicable to installations into wood with a moisture content that does not exceed 19%.
3. Wet values are applicable to installations into wood with a moisture content greater than 19% at time of installation or in service. Values include a NDS wet service factor for the fasteners.
4. DTT1Z installations with allowable loads of less than 750 lbs. do not satisfy the 2015 IRC requirements for deck-to-house lateral load connections.
5. A standard ⅜" cut washer is required when using a ⅜" machine bolt, anchor bolt or lag screw.
6. The Strong-Drive® SDWH Timber-Hex HDG screw with a min. of 3" of thread penetration into dry lumber has an allowable withdrawal load (160) of 1380 lbs. into SP, 1225 lbs. into DF and 1020 lbs. into SPF/HF.
7. Load values are valid if the product is flush with the end of the framing member or installed away from the end.
8. FASTENERS: SD #9x1½" (model SD9112) = 0.131" dia. x 1½" long, 10dx1½" = 0.148" dia. x 1½" long.



**ACCESS DOOR
TO SPACE ABOVE
FINISHED BASEMENT
CEILING**



FOR LEDGER ATTACHMENTS TO FLOORS CONSTRUCTED WITH I-JOISTS OR FLOOR TRUSSES, SEE THE MANUFACTURER'S INSTRUCTIONS.

DECK BEAMS

Construct beams using two or more 2 inch nominal pieces of lumber. Nail beams together using 10d nails at 32 inches o.c. along each edge of the beam and staggered. A spacer may be used to fir 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.

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 × 6	4-11	4-0	3-7	3-3	3-0	2-10	2-8
	1 - 2 × 8	5-11	5-1	4-7	4-2	2-10	3-7	3-5
	1 - 2 × 10	7-0	6-0	5-5	4-11	4-7	4-3	4-0
	1 - 2 × 12	8-3	7-1	6-4	5-10	5-5	5-0	4-9
	2 - 2 × 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
	2 - 2 × 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
	2 - 2 × 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0
	2 - 2 × 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0
	3 - 2 × 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3 - 2 × 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
	3 - 2 × 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6
	3 - 2 × 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 × 6 or 2 - 2 × 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3 × 8 or 2 - 2 × 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 × 10 or 2 - 2 × 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3 × 12 or 2 - 2 × 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4 × 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 × 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 × 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 × 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	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

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. 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 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.

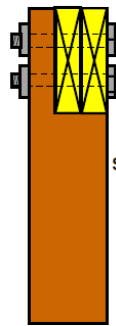
f. Northern species. Incising factor not included.

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

METHODS OF ATTACHING BEAM TO COLUMN

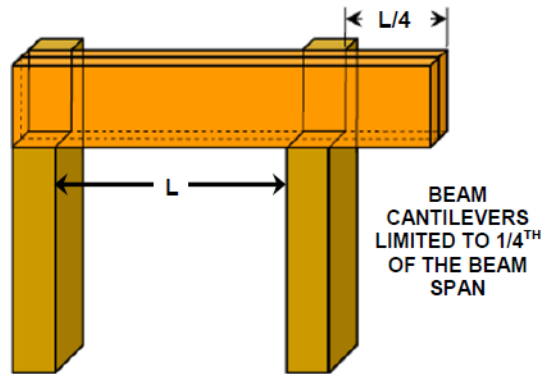
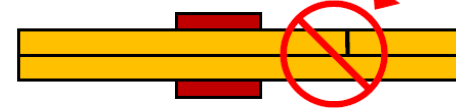
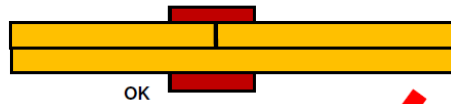


BEAM
SECURED
WITH
POST
CAP



BEAM
SECURED WITH
BOLTS TO
NOTCHED
COLUMN

BEAM SPLICES



BEAM
CANTILEVERS
LIMITED TO 1/4TH
OF THE BEAM
SPAN

COLUMNS

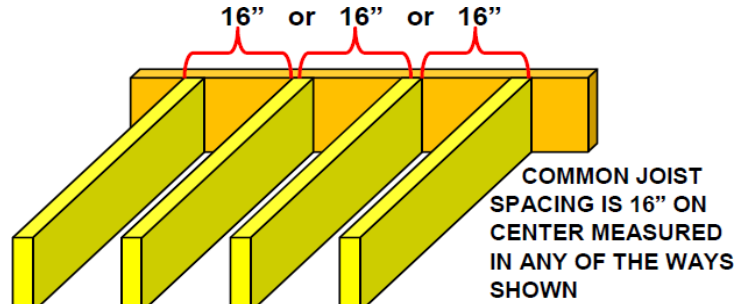
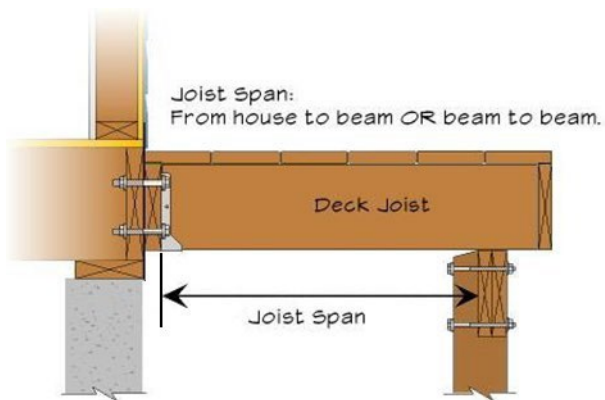
TABLE R507.4
DECK POST HEIGHT^a

DECK POST SIZE	MAXIMUM HEIGHT ^{a, b} (feet-inches)
4 × 4	6-9 ^c
4 × 6	8
6 × 6	14
8 × 8	14

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

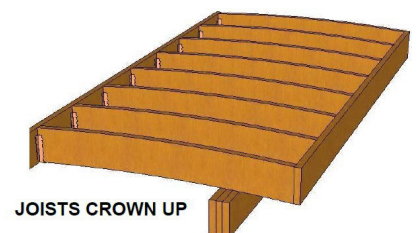
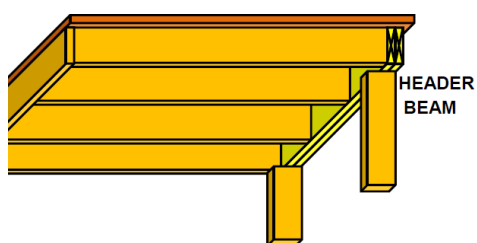
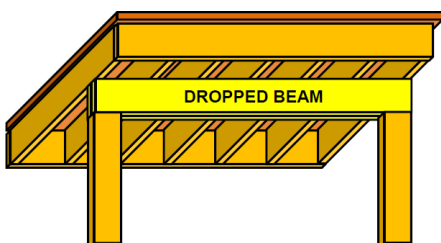
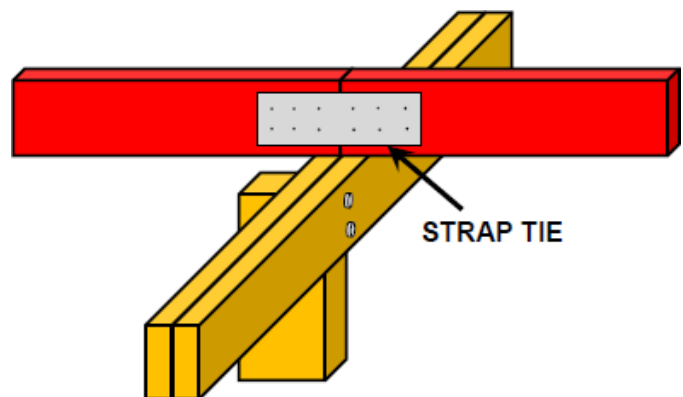
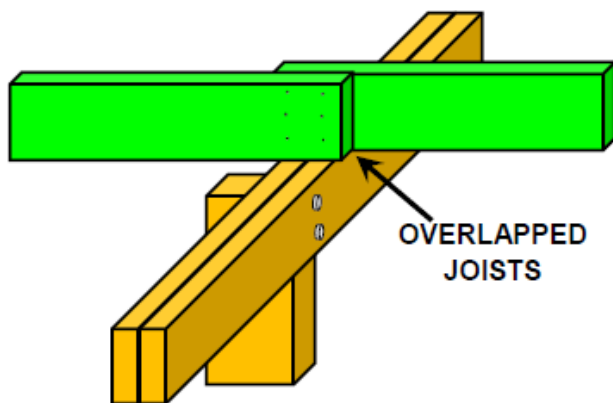
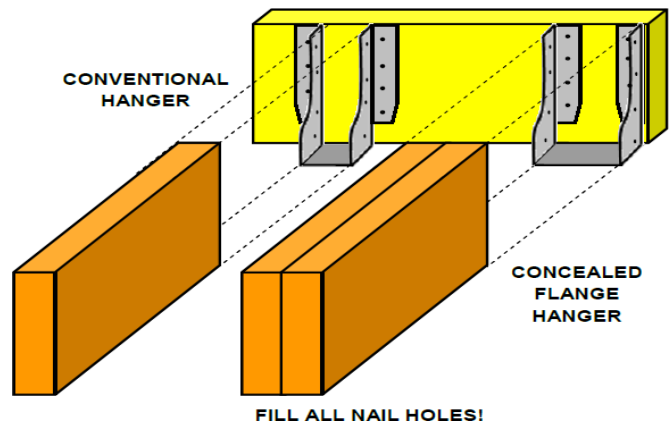
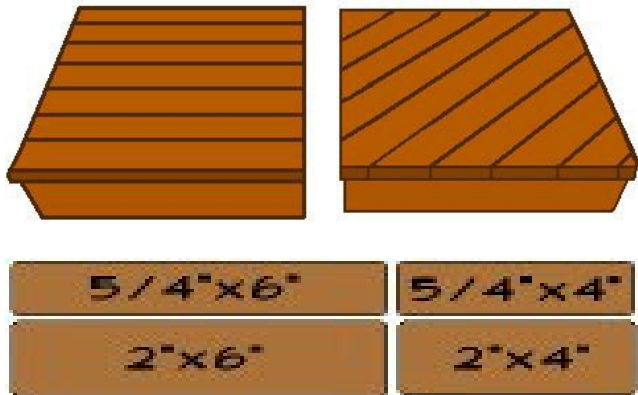
- Measured to the underside of the beam.
- Based on 40 psf live load.
- The maximum permitted height is 8 feet for one-ply and two-ply beams. The maximum permitted height for three-ply beams on post cap is 6 feet 9 inches.

JOIST DETAILS

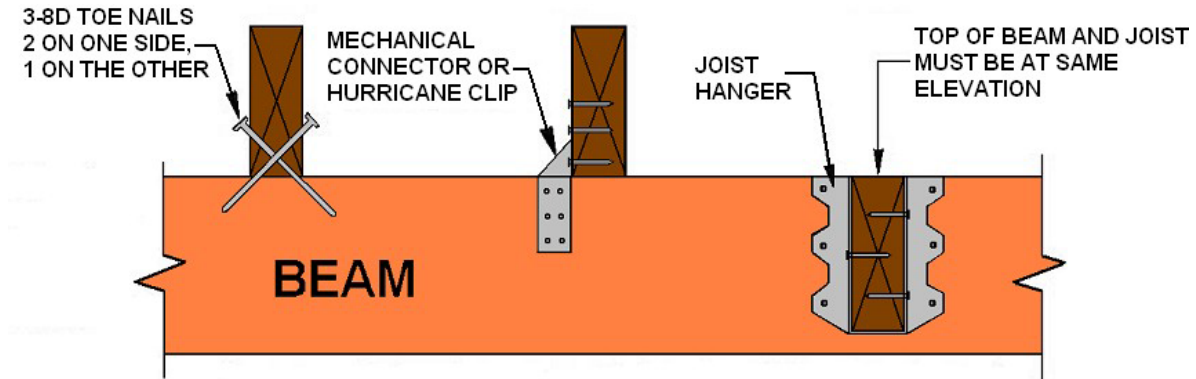


Joist spacing is determined by the type of decking used. 16" o.c. spacing must be used with 5/4 decking or when 2x6 or 2x4 decking is used at a 45° angle. 12" o.c. spacing required when 5/4 decking is used at a 45° angle.

WOOD DECKING

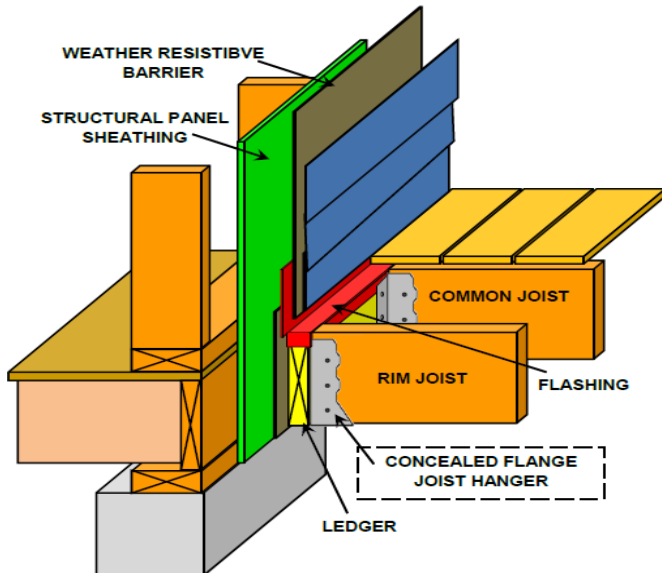


JOIST TO BEAM ATTACHMENTS



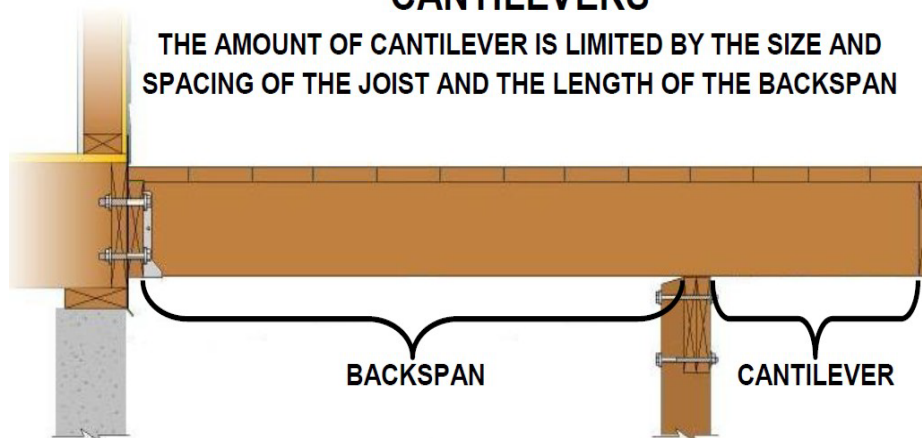
Joists must bear on a beam, ledger strip, or joist hangers. Joist hangers must be installed in accordance with the manufacturer's recommendations. ***Fill all nail holes in joist hangers.***

RIM JOIST ATTACHED TO LEDGER WITH CONCEALED FLANGE HANGER

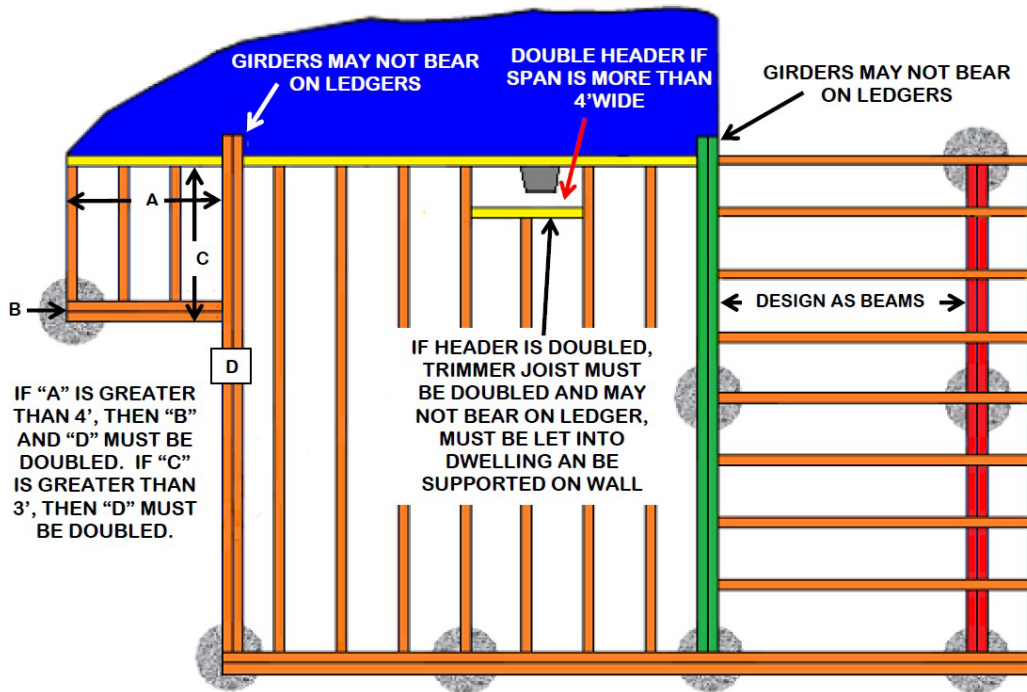
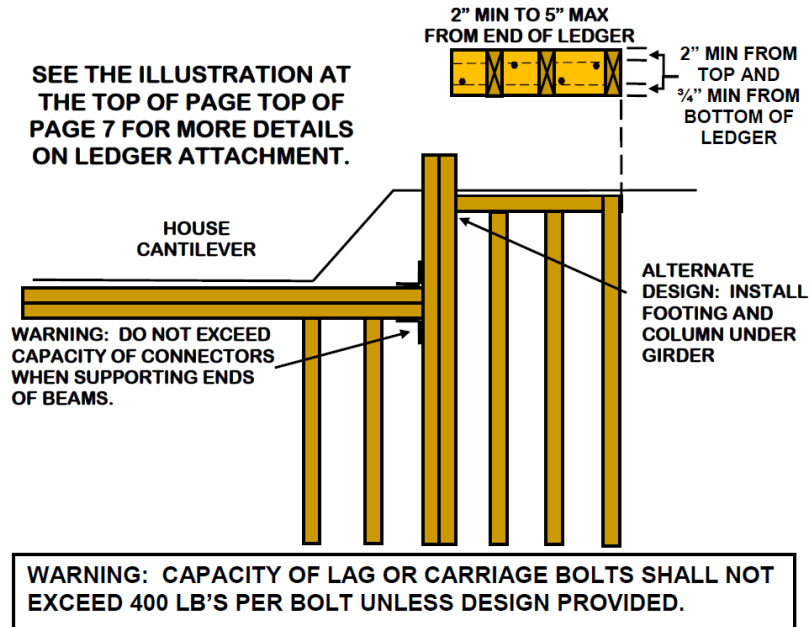


CANTILEVERS

THE AMOUNT OF CANTILEVER IS LIMITED BY THE SIZE AND
SPACING OF THE JOIST AND THE LENGTH OF THE BACKSPAN



SPECIAL FLOOR FRAMING DETAILS

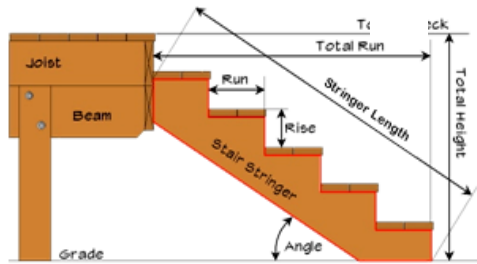


STAIRS

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 inches wide above the handrail and 31½ inches below the handrail.

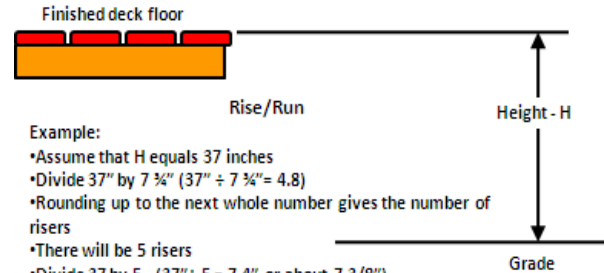
STAIR TERMINOLOGY



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.

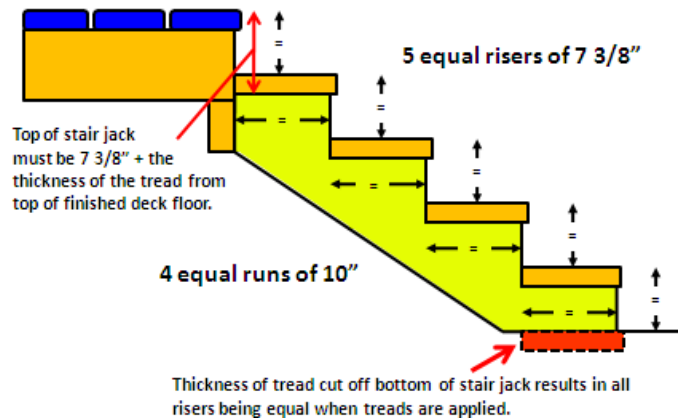
DETERMINING RISE/RUN



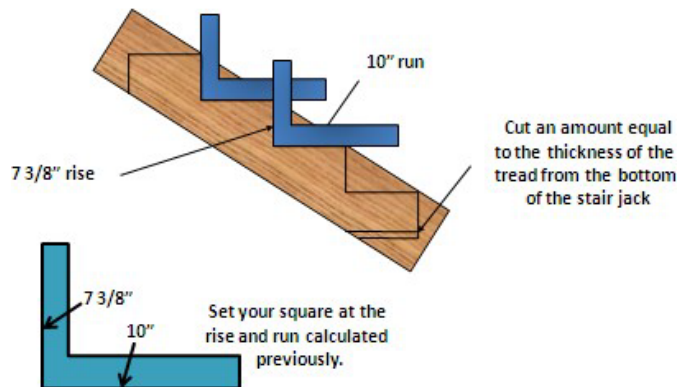
Example:

- 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" ($10" \times 4 \text{ treads} = 40"$)

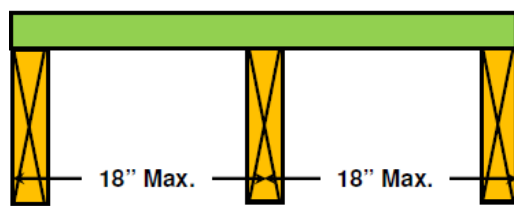
THE COMPLETED STAIR



LAYING OUT STAIR JACKS



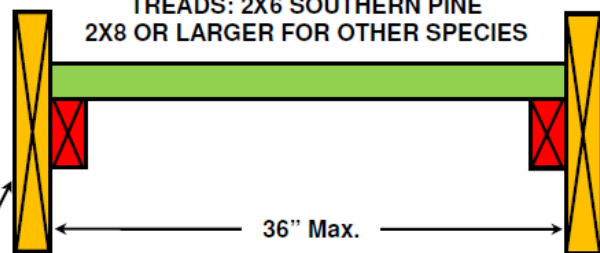
TREADS: 2X₆ or 5/4 DECKING



Min. of 3 cut stringers

STRINGERS

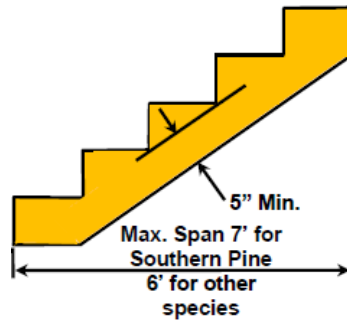
TREADS: 2X6 SOUTHERN PINE
2X8 OR LARGER FOR OTHER SPECIES



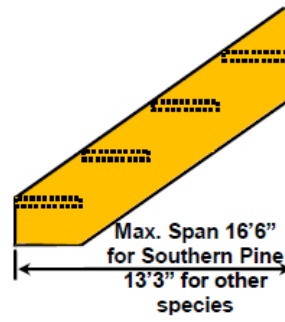
36" Max.

STAIR STRINGER SPANS

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

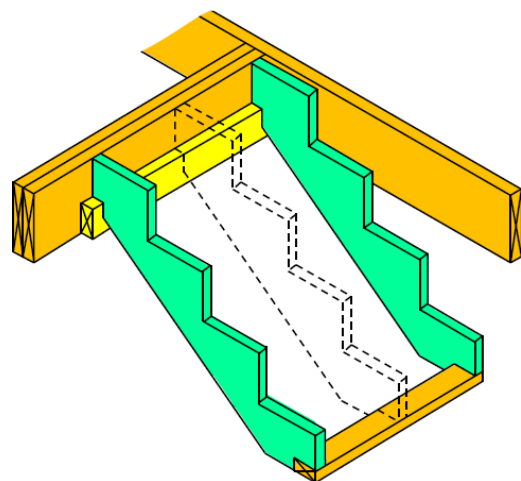
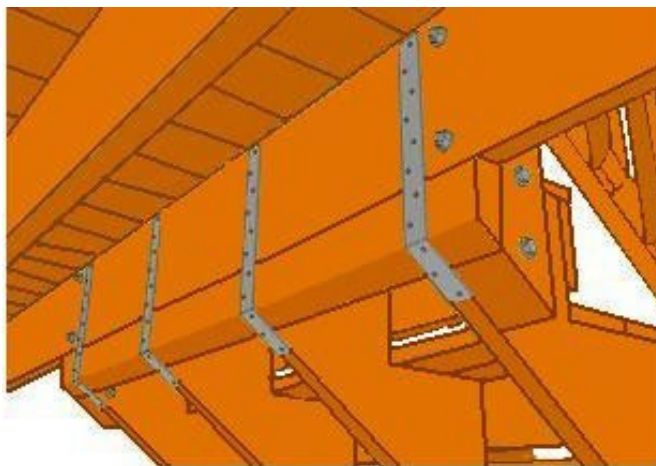
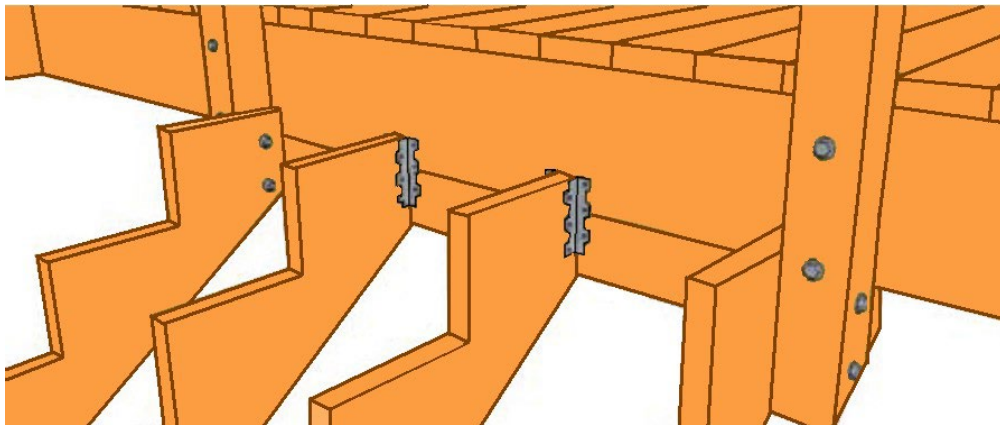


CUT STRINGER



SOLID STRINGER

STAIR ATTACHMENTS



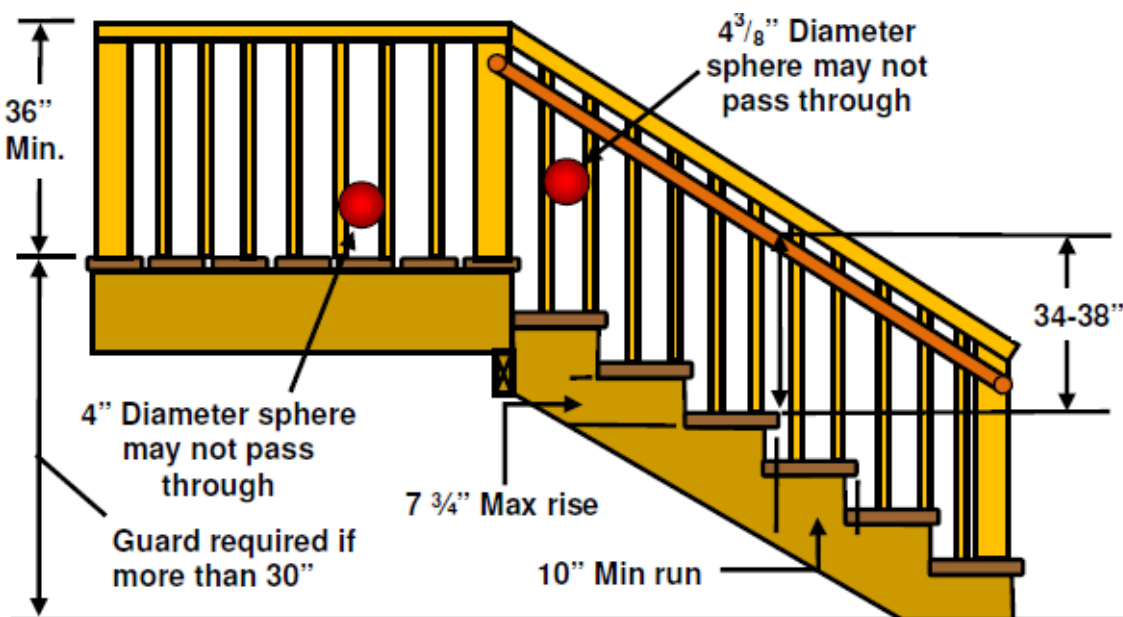
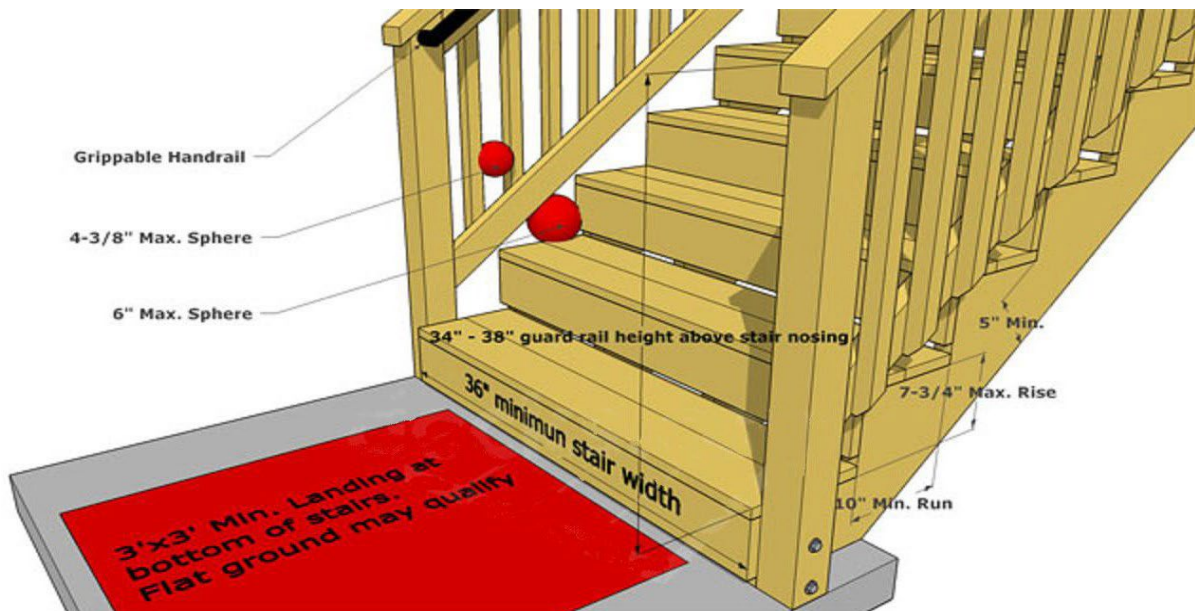
GUARDS AND HANDRAILS

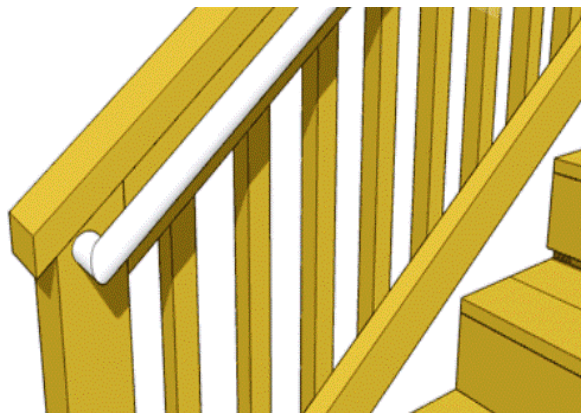
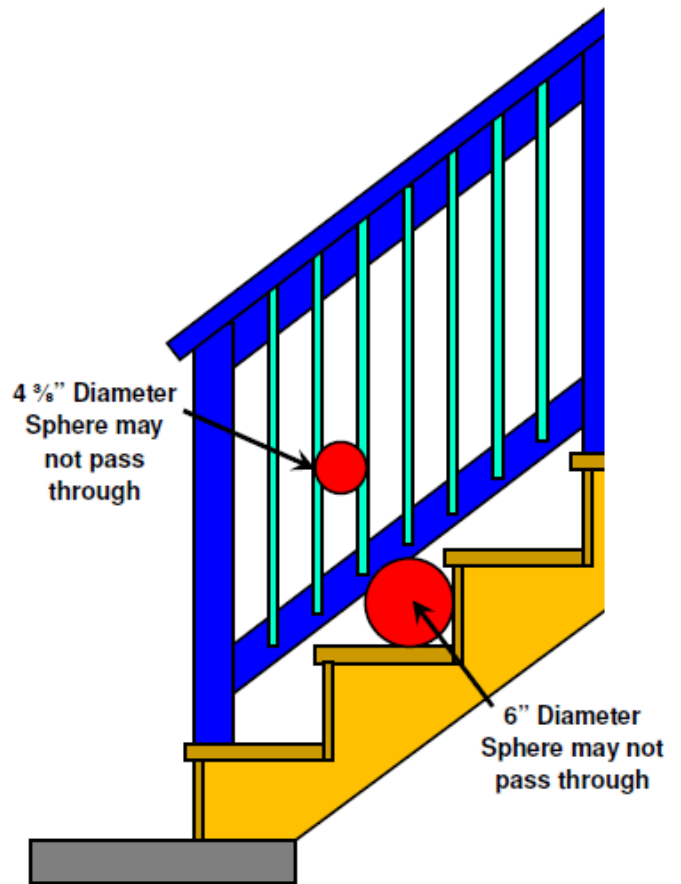
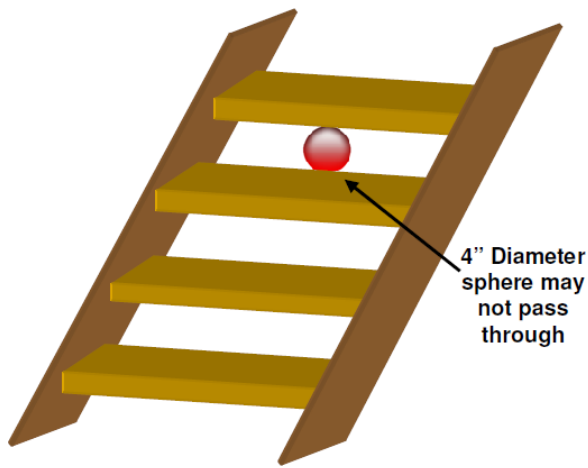
Guards and handrails must be provided as shown on the following illustrations. Guards must continue downstairs where the stair is more than 30 inches above grade. The height of guards on stairs must be 34 inches minimum.

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.

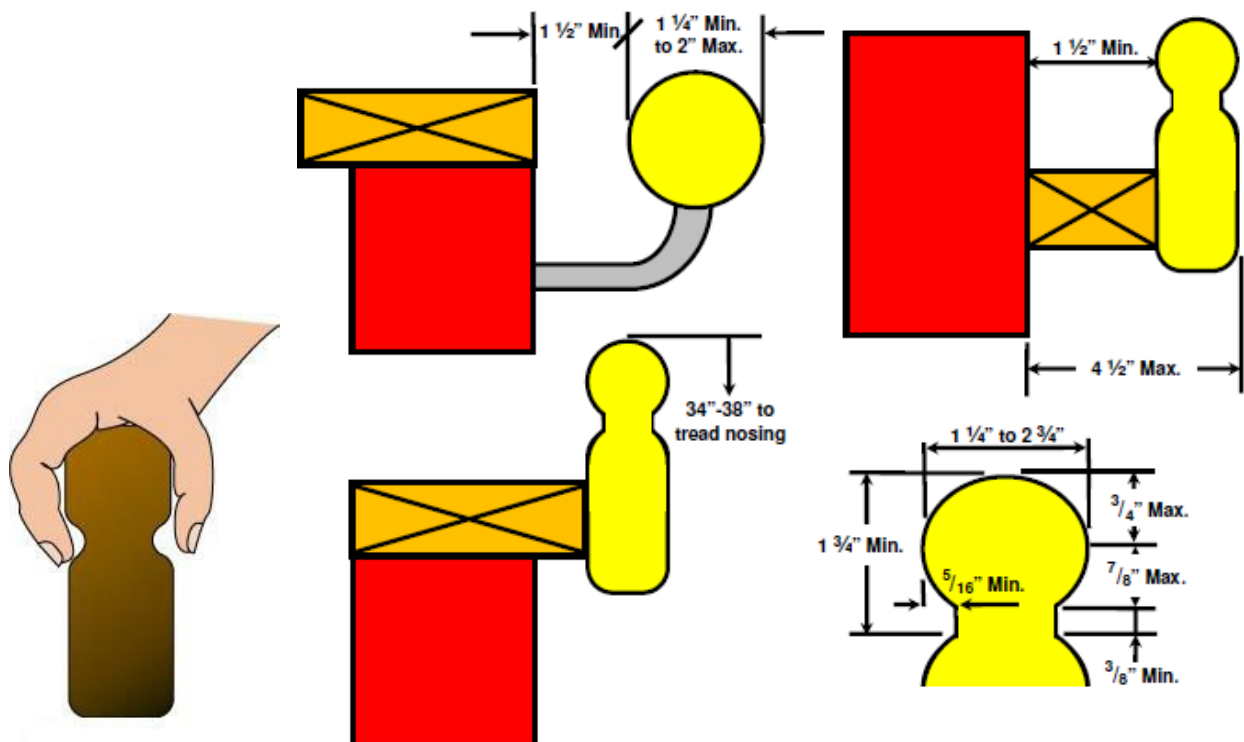
Handrails must be continuous for the entire length of the stairs and may not be interrupted by newel posts except at landings.

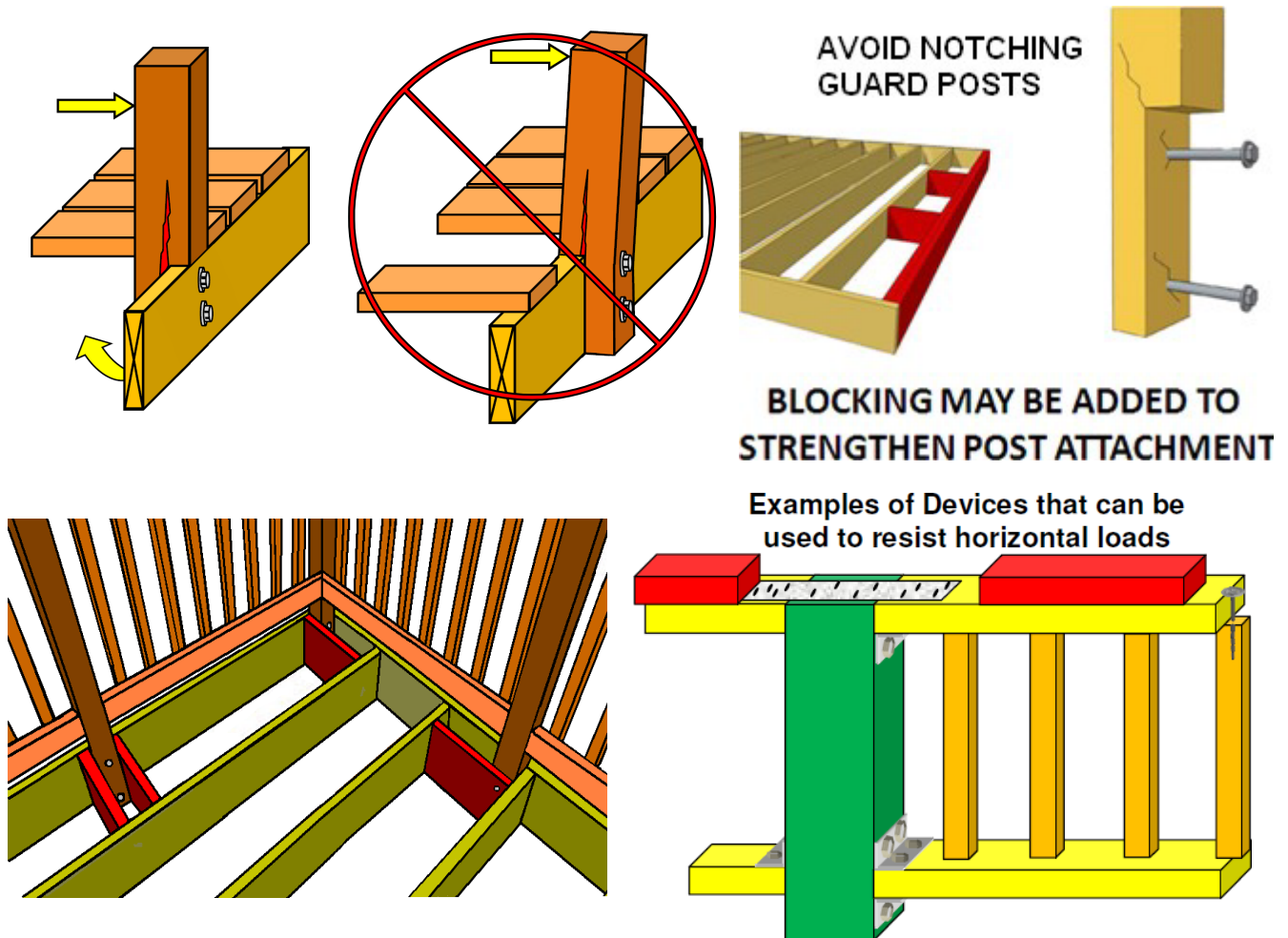
Handrails and guards must be designed to support a 200 lb load applied in any direction at any point along the top of the guard or rail. The bottoms of the stringers should rest on a sound foundation such as a gravel bed, a concrete pad, pavers, or similar.





HANDRAILS MUST RETURN TO A NEWEL POST AND BE CONTINUOUS WITHOUT INTERRUPTION FOR THE LENGTH OF THE FLIGHT





COMPOSITES AND OTHER DECK/RAILING PRODUCTS

Wood/plastic composites used for exterior deck boards, stair treads, handrails and guardrail systems must bear labels indicating compliance with ASTM D 7031 or a current ICC Evaluation Services Report must be made available.

Wood/plastic composites complying with ASTM D 7031 must be installed in accordance with the manufacturer's written installation instructions.

Wood/plastic composites having an ICC ES Report must be installed in accordance with the manufacturer's installation instructions and the report.

READ THE INSTRUCTIONS AND THE REPORTS CAREFULLY. ALL PRODUCTS HAVE SPECIFIC REQUIREMENTS FOR STAIR TREADS. SOME ARE LIMITED TO INSTALLATION PERPENDICULAR TO JOISTS ONLY.

PRODUCTS MADE OF ALUMINUM, STEEL, GLASS, OR ANY OTHER MAN-MADE PRODUCT MAY BE USED IF THE MANUFACTURER HAS A RESEARCH REPORT FROM THE INTERNATIONAL CODE COUNCIL AND THE PRODUCT IS INSTALLED IN STRICT ACCORDANCE WITH THAT REPORT OR SITE SPECIFIC ENGINEERING IS PROVIDED.