



**City of White Bear Lake
Building Department
4701 Highway 61 N.
White Bear Lake, Minnesota 55110
651-429-8518 | www.whitebearlake.org
buildingdepartment@whitebearlake.org**

Decks / Porches / Pergolas

This handout is a summary of the permit & inspection process as well as standard requirements based on State Building Code and White Bear Lake City Zoning regulations regarding Residential Decks and Porches (3 season, 4 season, screen or unenclosed). Information contained herein does not contain all of the specific codes for construction, and shall only be used as a guide.

*Decks not attached to a structure *AND* less than 30 inches require a \$50 Zoning Permit (see Zoning Permits).

Permit Submission Requirements:

- Completed building permit application, including valuation (materials & labor).
- Two complete sets of structure plans (footing plan, framing plan and elevations).
- Two copies of a survey or site Plan (which includes lot lines and dimensions, the locations and ground coverage area (size) of all existing structures, the location of proposed deck, indicate setbacks from property lines and any additional information which may be required).
- Deck Application Supplement
- If a porch is attached and enclosed, it is considered living area. If a porch is unenclosed, or a deck and it is located on the back side of the home, the rear yard coverage worksheet is required.
- If the property is located in the shoreland overlay district, the impervious area calculation worksheet is required.

Zoning Requirements: Refer to General Residential Setback Requirements Guidelines.

Deck / Porch Permit Fees: See the White Bear Lake Fee Schedule at www.whitebearlake.org

Licensing Requirements:

- Contractors must be licensed in the State of Minnesota if performing more than one single trade. Minnesota State license number must be provided on permit application.
- Contractors working on a structure built prior to 1978 are required to provide their Lead Certification Number (see permit application for exceptions.)
- Property owners may perform building related trades on property they own. Property owners may perform mechanical trades, such as plumbing, heating & electrical on property they own and occupy, otherwise a licensed contractor is required. Property owners doing their own work will be required to sign the Property Owner Waiver acknowledging their responsibilities to the Minnesota State Building Code, to Zoning Ordinances and to other applicable rules and regulation when they are acting as general contractor. All sub-contractors hired must be licensed and disclosed on the application.
- Rental property owners may perform building trade work. However, all plumbing, HVAC and electrical work on rental property shall be performed by a licensed contractor.
- Property owners renovating dwellings with the intent to sell must be state licensed if performing work on more than one property in a two-year period.

Inspection Requirements: The inspection card and approved plans must be on site upon the start of work until the final inspection has been performed and passed. All construction work shall remain accessible and exposed for inspection until approved by the Building Inspection Department.

All required inspections will be listed on the permit card. A final inspection is required upon completion of project and approvals for all other inspections have been complete; please call 651-429-8518 to schedule an inspection. A 24 hour notice is required for all inspections (time frame is subject change during busy times).

Information and Guidelines:

Setback Information:

- **Enclosed or Covered Porches:** Same setbacks required as the principal structure.
- **Unenclosed or Uncovered Decks:** May extend into front or rear yard setbacks up to 8 feet, provided it is not higher than the entrance floor level of the building.
- **Pergolas:** Trellis like structures without roof or walls require a zoning permit if less than 200 square feet in size and a building permit if greater than 200 square feet in size. If it is attached to the home, the same setbacks as a deck shall apply. If it is detached, the same setbacks as a shed shall apply. Pergolas do not count as one of the two allowed accessory structures, but do count towards rear yard cover.

Structural Definitions:

- **Cantilevers: "Overhanging Joists and Beams:** Joists should not overhang beams by more than two feet, nor should beams overhang posts by more than one foot unless a special design is approved.
- **Flashing:** All connections between deck and dwelling shall be weatherproof. Any cuts in exterior finish shall be flashed.
- **Deck Ledger:** The deck ledger shall be properly attached with lag screws and provided with hold down tension devices in at least two locations.
- **Framing Details:** Joists frames into the side of a girder shall be supported by an approved joist hanger and ledger strip not less than 2" by 2".
- **Frost Footings:** Frost footings shall be required for any deck attached to a dwelling, porch or garage that has frost footings. The minimum depth to the base of the footing is 42". The diameter of the frost footing is determined on the load imposed.
- **Guardrails:** Required on all decks more than 30 inches above grade. Rail must be 36 inches minimum in height. Open guardrails and stair railings must have intermediate rails or an ornamental pattern that a four inch sphere cannot pass through.
- **Handrails:** The top shall be placed not less than 34 inches or more than 38 inches above the nosing of the treads. Stairways having four or more risers shall have at least one handrail. Handrail ends shall be returned or terminated in posts. The hand grips shall not be less than 1 1/2 inches or more than 2 inches in cross-sectional dimension or the shape shall provide an equivalent gripping surface. The handgrip shall have a smooth surface with no sharp corners.
- **Live Load/Dead Load:** All decks shall be designed to support a live load of 50 pounds per square foot.
- **Nails and Screws:** Use only stainless steel, high strength aluminum or hot-dipped galvanized. Approved nails must be used on joist hangers as per manufacturer's specs.
- **Special Design Note:** Think you might enclose your deck in the future? Deck plans are 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.
- **Stairs:** Minimum width is 36 inches. Maximum rise is 7 ¼ inches, minimum rise is 4 inches. Minimum run is 10 inches. Largest tread width or riser height shall not exceed the smallest by more than 3/8 inch. Nominal 2 inch material required for exterior stair construction.
- **Wood Required:** All exposed wood used in the construction of decks is required to be of approved wood of natural resistance to decay(redwood, cedar, etc.) or approved treated wood. This includes posts, beams, joists, decking and railings. When redwood and cedar are proposed it must be verified as heartwood

This document is for informational purposes only and not intended to address every situation for the permitting and plan review process.

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.

FASTENER SPACING FOR A SOUTHERN PINE OR HEM-FIR DECK LEDGER AND A 2-INCH-NOMINAL SOLID-SAWN SPRUCE-PINE-FIR BAND JOIST (c, f, g) (Deck live load = 40 psf, deck dead load = 10 psf)

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'
Connection details	On-center spacing of fasteners (d, e)						
½ inch diameter lag screw with 15/32 inch maximum sheathing (a)	30	23	18	15	13	11	10
½ inch diameter bolt with 15/32 inch maximum sheathing	36	36	34	29	24	21	19
½ inch diameter bolt with 15/32 inch maximum sheathing and ½ inch stacked washers (b, h)	36	36	29	24	21	18	16

- The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- The maximum gap between the face of the ledger board and face of the wall sheathing shall be ½ inch.
- Ledgers shall be flashed to prevent water from contacting the house band joist.
- Lag screws and bolts shall be staggered in accordance with Section R507.2.1.
- Deck ledger shall be minimum 2 × 8 pressure-preservative-treated No. 2 grade lumber, or other approved materials as established by standard engineering practice.
- When solid-sawn pressure-preservative-treated deck ledgers are attached to a minimum 1-inch-thick engineered wood product (structural composite lumber, laminated veneer lumber or wood structural panel band joist), the ledger attachment shall be designed in accordance with accepted engineering practice.
- A minimum 1 × 9½ Douglas Fir laminated veneer lumber rim board shall be permitted in lieu of the 2-inch nominal band joist.
- Wood structural panel sheathing, gypsum board sheathing or foam sheathing not exceeding 1 inch in thickness shall be permitted. The maximum distance between the face of the ledger board and the face of the band joist shall be 1 inch.

Capacity of lag or carriage bolts shall not exceed 400 lbs. per bolt unless design provided.

PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS

MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS

	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Ledger ^a	2 inches ^d	¼ inch	2 inches ^b	1 ⅝ inches ^b
Band Joist ^c	¾ inches	2 inches	2 inches ^b	1 ⅝ inches ^b

- 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 R507.2.1 (1).
- Maximum 5 inches.
- For engineered rim joists, the manufacturer's recommendations shall govern.
- The minimum distance from bottom row of lag screws or bolts to the top edge of the ledger shall be in accordance with Figure R507.2.1(1).

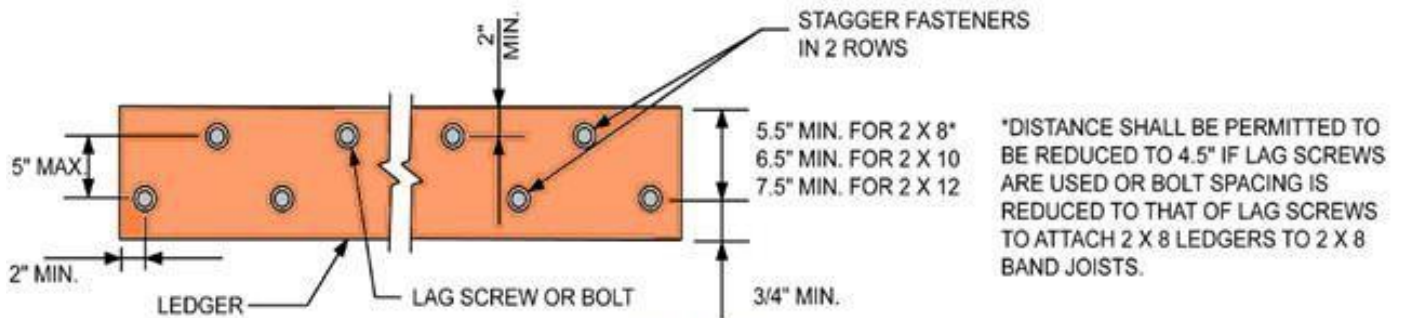
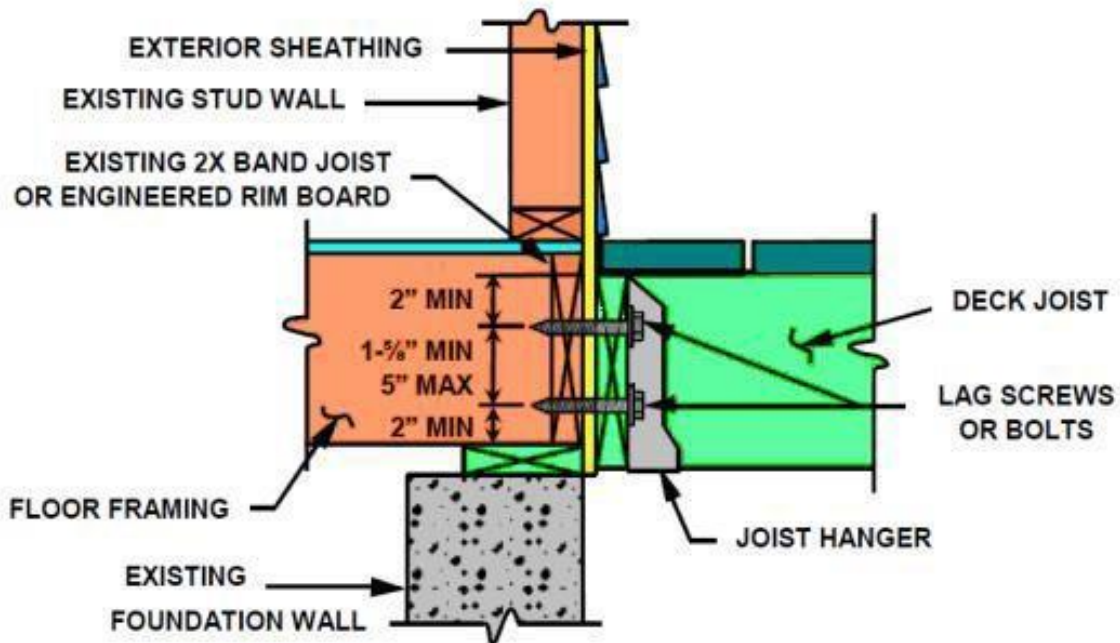
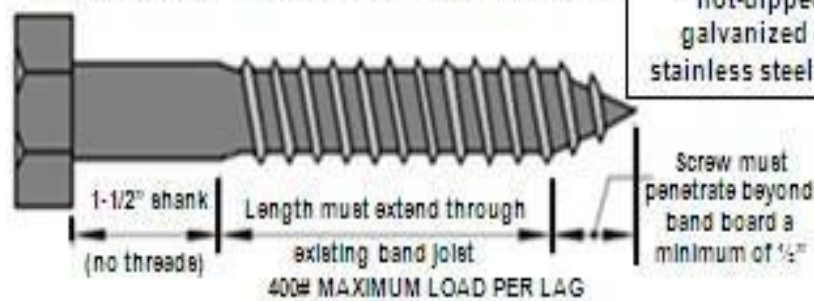


FIGURE R507.2.1(1)
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS

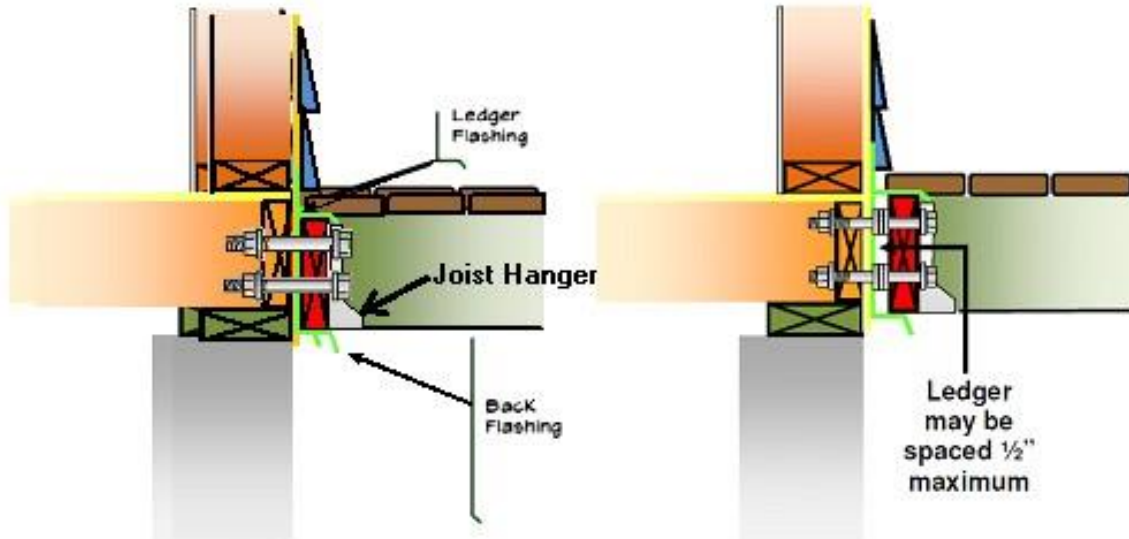
PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS



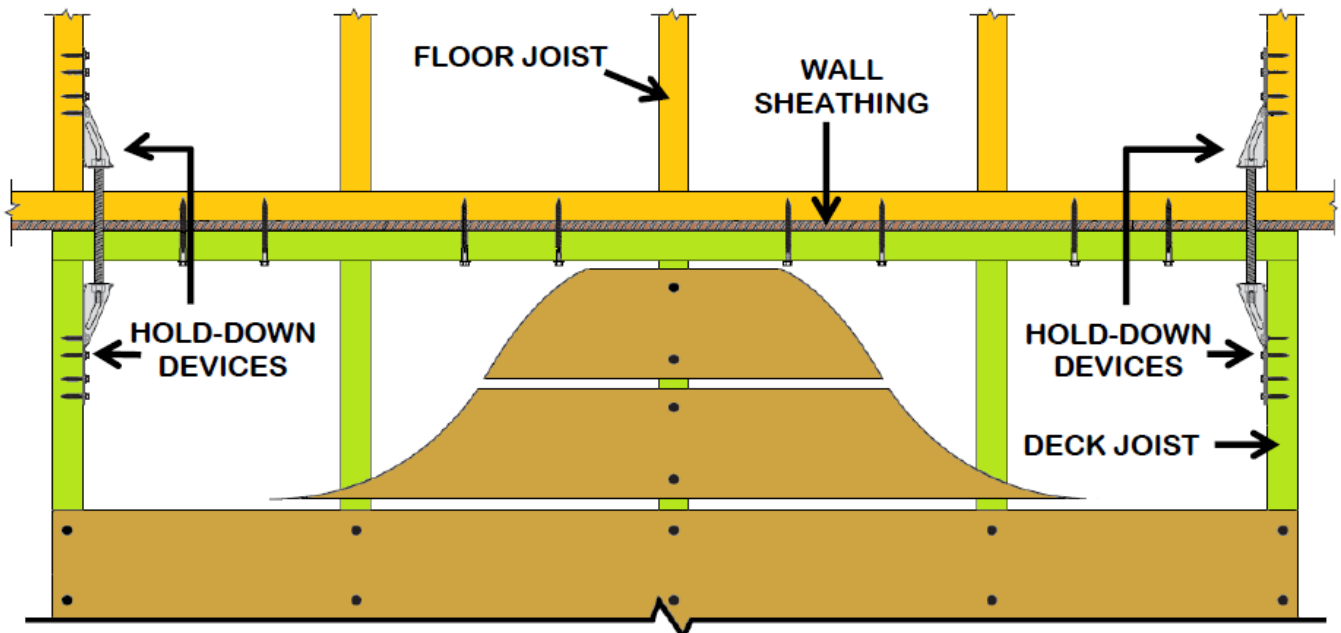
1/2" DIAMETER LAG SCREWS MINIMUM



LEDGER FLASHING DETAIL

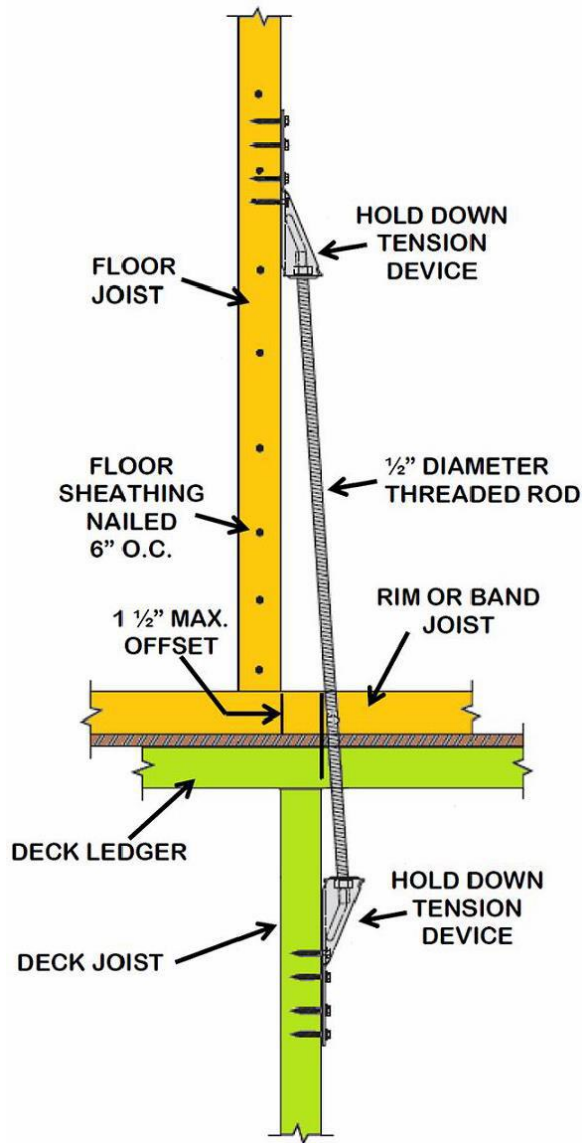


LATERAL LOAD CONNECTIONS TWO MINIMUM PER DECK (See "Alternate Methods" page 10)

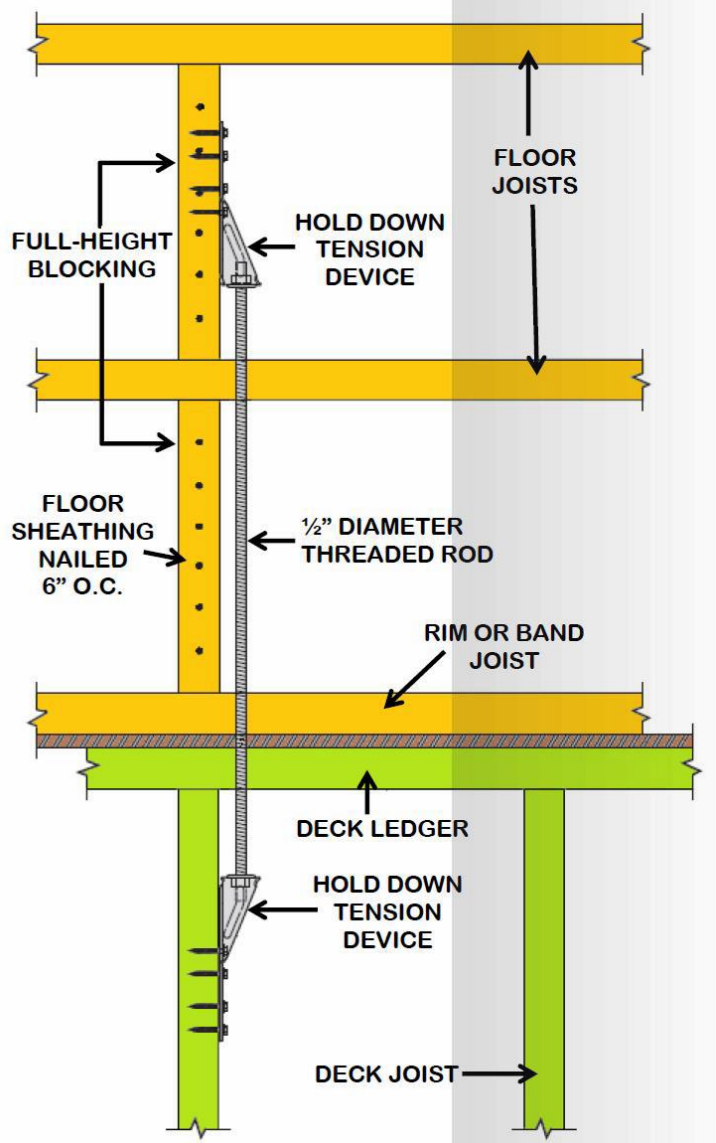


- HOLD-DOWN TENSION DEVICES MUST BE INSTALLED IN NOT LESS THAN TWO LOCATIONS PER DECK
- EACH DEVICE MUST HAVE AN ALLOWABLE STRESS DESIGN CAPACITY OF NOT LESS THAN 1500 POUNDS.
- FLOOR SHEATHING IN THE DWELLING MUST BE NAILED TO THE JOISTS TO WHICH HOLD DOWNS ARE CONNECTED AT 6" MAXIMUM O.C.
- ALTERNATIVELY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

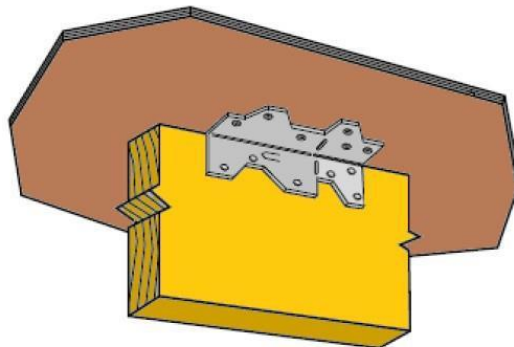
FLOOR JOISTS PERPENDICULAR TO DECK LEDGER



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

ALTERNATIVE DECK LATERAL LOAD CONNECTORS (or approved equivalent)



LTS19-TZ Deck Lateral Load Connector

The LTS19-TZ holdown can be used to build stronger, safer, deck structures. It will meet the new lateral connection requirements outlined in the 2015 International Residential Code (IRC) by attaching deck floor joist members to the main structure. The LTS19-TZ can also be used for deck rail post reinforcement.

Materials: Strap: 16Ga G-185 galvanizing
Washer - 3Ga USP primer

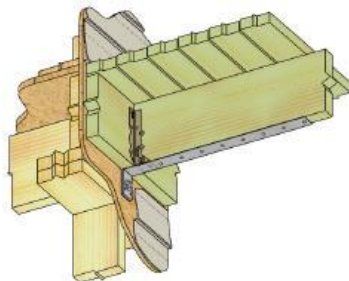
Codes: ER-200, FL14500

Installation:

- The LTS19-TZ must be installed flush to the surface of the outside wall of the home.
- Use the building code specified 3/8" lag screw and washer to secure the base of the LTS19-TZ to the main house structure. The minimum embedment depth for the lag screw is 3".
- Tighten lag screw until snug to the base of the LTS19-TZ, with a wrench or socket, to prevent loosening of the lag screw.
- Use all specified 10d common nails to attach the strap portion of the connector to the bottom of the deck floor joist.
- See additional installation instructions on detail drawing.



LTS19-TZ



LTS19-TZ Application



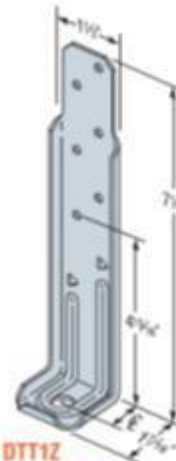
Decks & Fences

DTT Deck Tension Ties

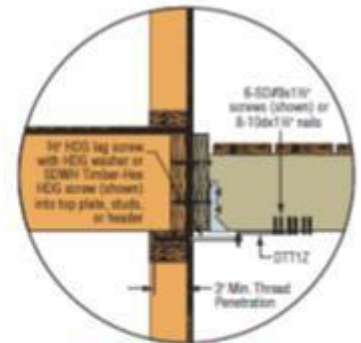
DTT tension ties are safe, cost-effective connectors designed to meet or exceed code requirements for deck construction. These versatile DTT connectors are also load rated as a holdown for light-duty shearwalls and braced wall panel applications.

For new construction or to make an existing current deck code-compliant, the DTT1Z can be used as a tension-tie to satisfy the 2015 IRC provision for a 750 lbs. lateral load connection to the house at four locations per deck. This new code detail permits the lateral connection from the deck joists to be made to top plates, studs, or headers within the supporting structure, which eliminates the need to access to the floor joists inside the home.

The new DTT1Z fastens to the narrow or wide face of a single 2x with Simpson Strong-Tie® Strong-Drive® SD Connector screws or nails and accepts a 3/8" machine bolt, anchor bolt, or lag screw (*washer required*) or can be installed with the new Strong-Drive SDWH Timber-Hex HDG screw with an integral washer. The DTT2 fastens easily to the wide face of a single or double 2x using Simpson Strong-Tie Strong-Drive SDS Heavy-Duty Connector screws (included) and accepts a 1/2" machine bolt or anchor bolt.



DTT1Z
U.S. Patent Pending



Typical DTT1Z Deck-to-House Lateral Load Connection
For more information on lateral load connections, see technical bulletin T-DECKLTLLOAD

MATERIAL: 14 gauge

FINISH: DTT1Z/DTT2Z—ZMAX® coating;
DTT2SS—Stainless steel; see Corrosion Information, pages 13-15.

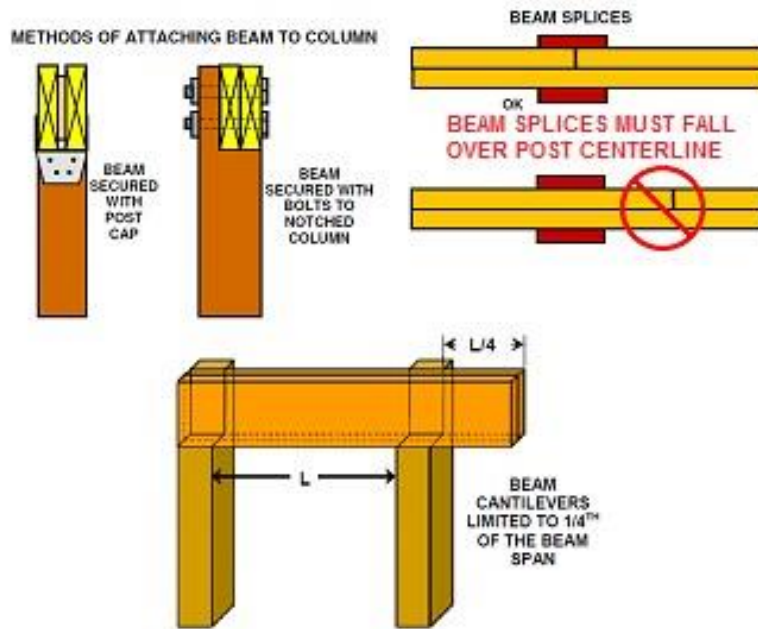
INSTALLATION:

- Use all specified fasteners. See General Notes.
- A standard cut washer (*included*) must be installed between the nut and the seat.
- Simpson Strong-Tie Strong-Drive SDS Heavy-Duty Connector screws install best with a low speed high torque drill with a 3/8" hex head driver.
- Strong-Drive SD Connector screws install with a 1/4" hex head driver.
- Strong-Drive SDWH Timber-Hex HDG screws install with a 1/2" hex head driver.

BEAMS

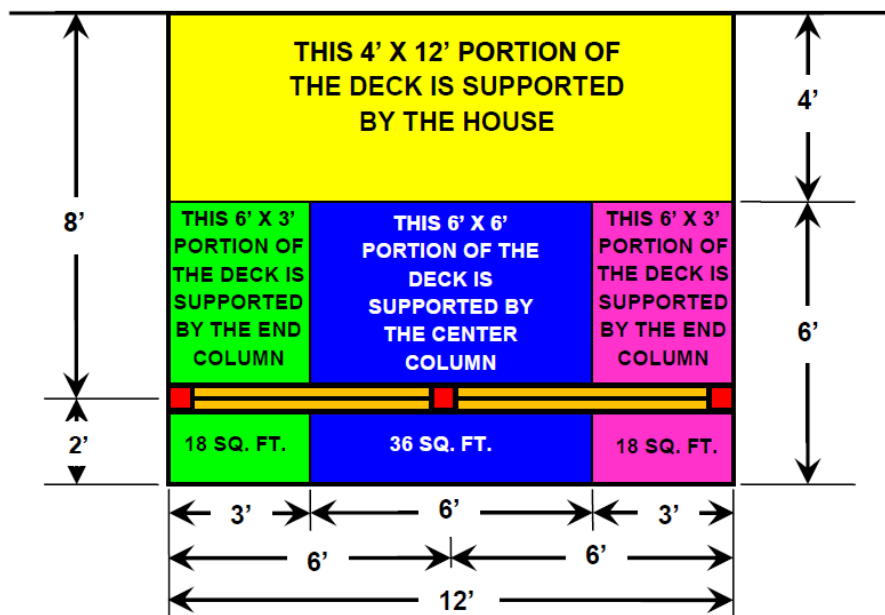
Construct beams using two or more 2 inch nominal pieces of lumber. Nail beams together using 10d nails at 32 inches o.c. along each edge of the beam and staggered. A spacer may be used to fir the beam to a 3½ -inch width. Beams should be installed with any arch or crown facing up. Attachments to columns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

BEAM SPANS (Wet Service) (Center of one column to center of next) (Source AF&PA; rev. 8-17-10)								
Species	Beam	Joist Spans						
		6'	8'	10'	12'	14'	16'	18'
Southern Pine	2-2X6	7'1"	6'2"	5'6"	5'0"	4'8"	4'4"	4'1"
	2-2X8	9'2"	7'11"	7'1"	6'6"	6'0"	5'7"	5'3"
	2-2X10	11'10"	10'3"	9'2"	8'5"	7'9"	7'3"	6'10"
	2-2X12	13'11"	12'0"	10'9"	9'10"	9'1"	8'6"	8'0"
	3-2X6	8'7"	7'8"	6'11"	6'3"	5'10"	5'5"	5'2"
	3-2X8	11'4"	9'11"	8'11"	8'1"	7'6"	7'0"	6'7"
	3-2X10	14'5"	12'10"	11'6"	10'6"	9'9"	9'1"	8'7"
	3-2X12	17'5"	15'1"	13'6"	12'4"	11'5"	10'8"	10'1"
Cedar	2-2X6	5'5"	4'8"	4'2"	3'10"	3'6"	3'1"	2'9"
	2-2X8	6'10"	5'11"	5'4"	4'10"	4'6"	4'1"	3'8"
	2-2X10	8'4"	7'3"	6'6"	5'11"	5'6"	5'1"	4'8"
Redwood	2-2X12	9'8"	8'5"	7'6"	6'10"	6'4"	5'11"	5'7"
Ponderosa Pine	3-2X6	7'4"	6'8"	6'0"	5'6"	5'1"	4'9"	4'6"
	3-2X8	9'8"	8'6"	7'7"	6'11"	6'5"	6'0"	5'8"
	3-2X10	12'0"	10'5"	9'4"	8'6"	7'10"	7'4"	6'11"
	3-2X12	13'11"	12'1"	10'9"	9'10"	9'1"	8'6"	8'1"



COLUMNS

		MAXIMUM POST HEIGHT IN FEET													
SPECIES	SIZE	SQUARE FEET OF DECK SUPPORTED													
		36	48	60	72	84	96	108	120	132	144	156	165	180	192
SOUTHERN PINE	4X4	10	10	10	9	9	8	8	7	7	6	6	6	6	6
	4X6	14	14	13	12	11	10	10	9	9	8	8	8	7	7
	6X6	17	17	17	17	17	17	17	17	16	16	15	14	13	13
REDWOOD CEDAR	4X4	10	10	9	8	7	7	6	6	5	4				
	4X6	14	13	12	11	10	9	8	8	7	7	7	6	6	5
	6X6	17	17	17	17	17	16	13	7						



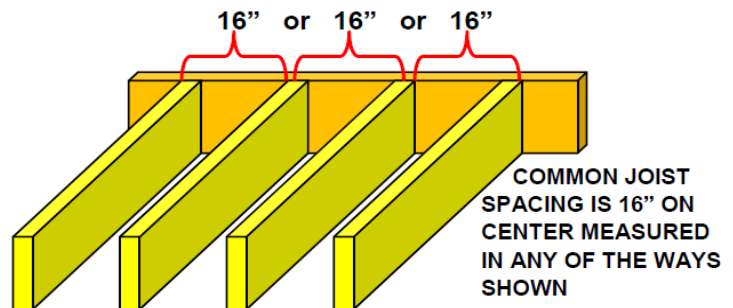
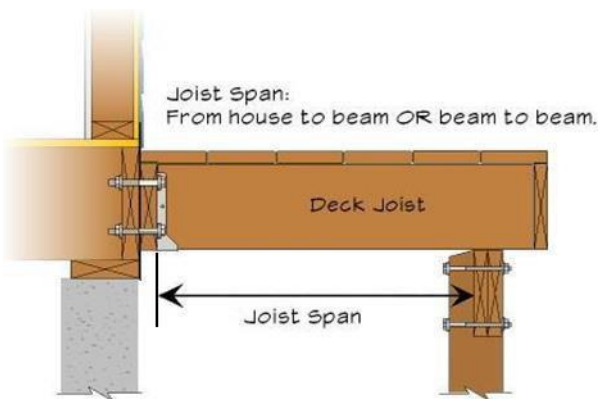
JOISTS

JOIST SPANS (Wet Service)

(Source AF&PA; rev. 8-17-10)

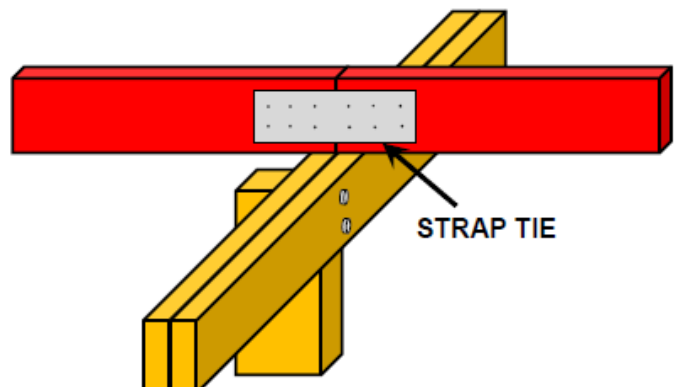
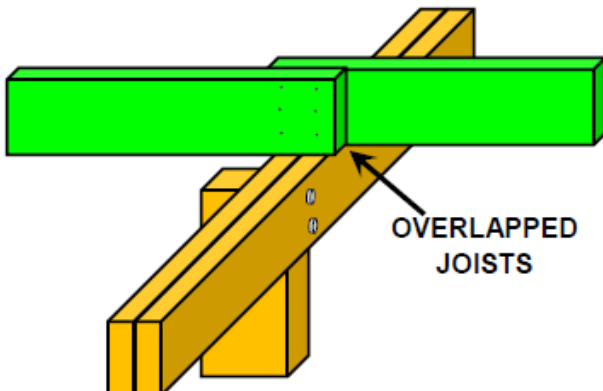
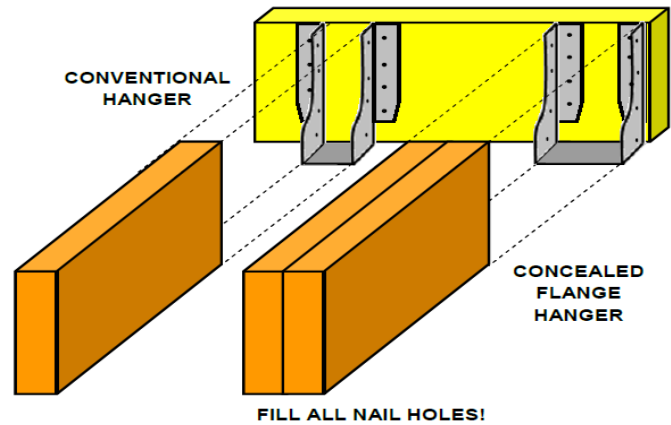
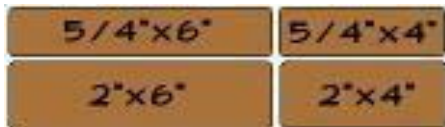
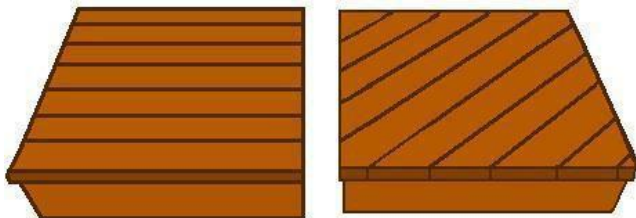
JOIST SIZE	SOUTHERN PINE			WESTERN CEDAR/PONDEROSA PINE		
	12" o.c.	16" o.c.	24" o.c.	12" o.c.	16" o.c.	24" o.c.
2X6	10'4"	9'5"	7'10"	8'10"	8'0"	7'0"
2X8	13'8"	12'5"	10'2"	11'8"	10'7"	8'8"
2X10	17'5"	15'10"	13'5"	14'11"	13'0"	10'7"
2X12	21'2"	18'10"	15'5"	17'5"	15'1"	12'4"

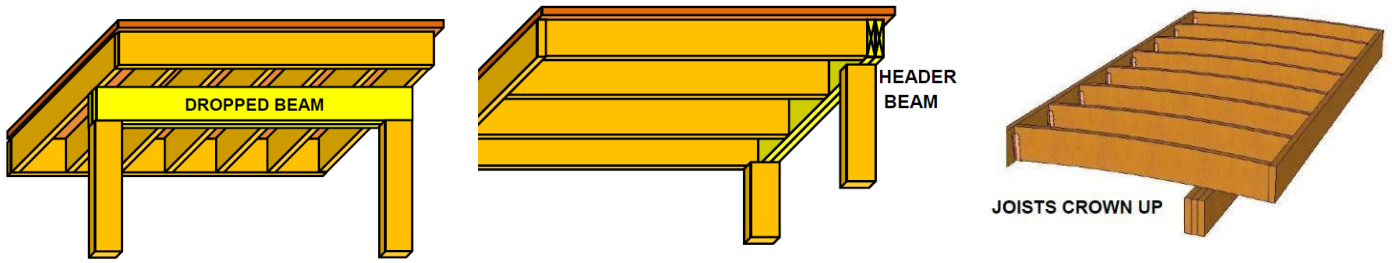
JOIST DETAILS



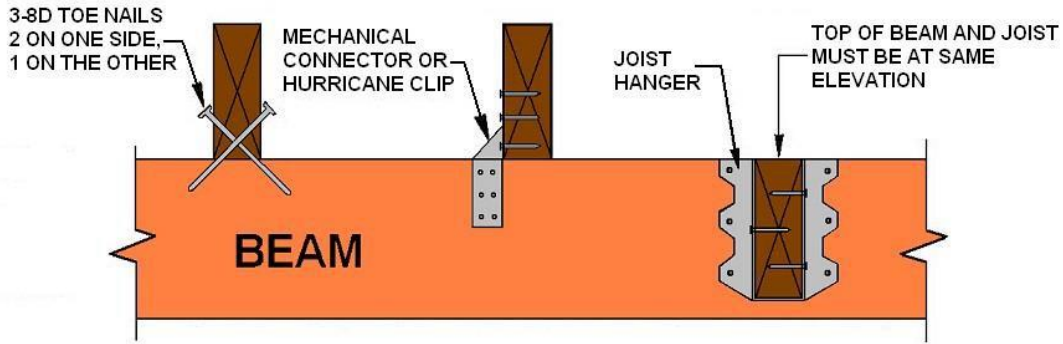
Joist spacing is determined by the type of decking used. 16" o.c. spacing must be used with 5/4 decking or when 2x6 or 2x4 decking is used at a 45° angle. 12" o.c. spacing required when 5/4 decking is used at a 45° angle.

WOOD DECKING



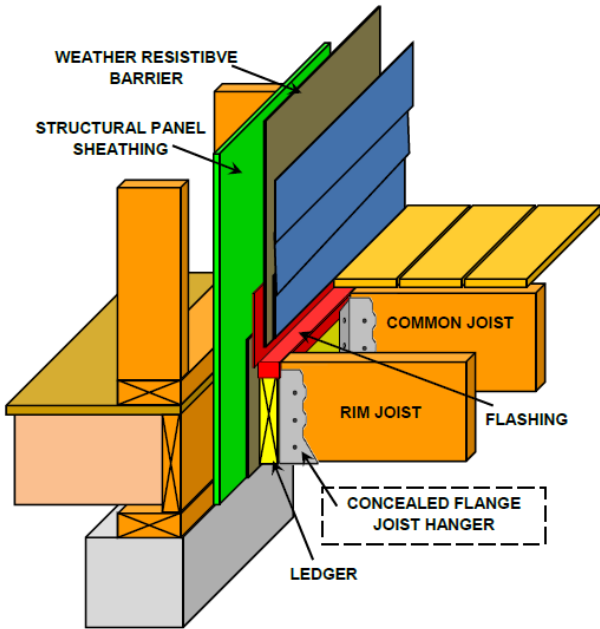


JOIST TO BEAM ATTACHMENTS

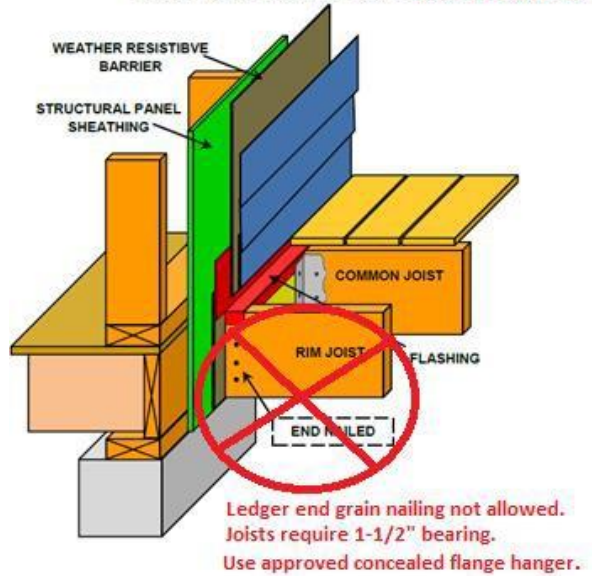


Joists must bear on a beam, ledger strip, or joist hangers. Joist hangers must be installed in accordance with the manufacturer's recommendations. **Fill all nail holes in joist hangers.**

RIM JOIST ATTACHED TO LEDGER WITH CONCEALED FLANGE HANGER



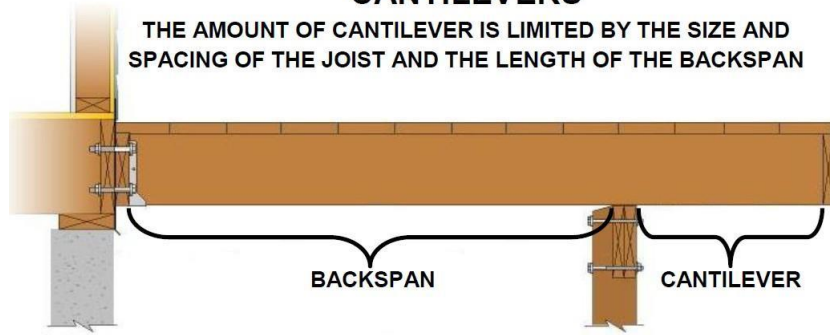
RIM JOIST ATTACHED TO LEDGER BY END NAILING - NOT ALLOWED



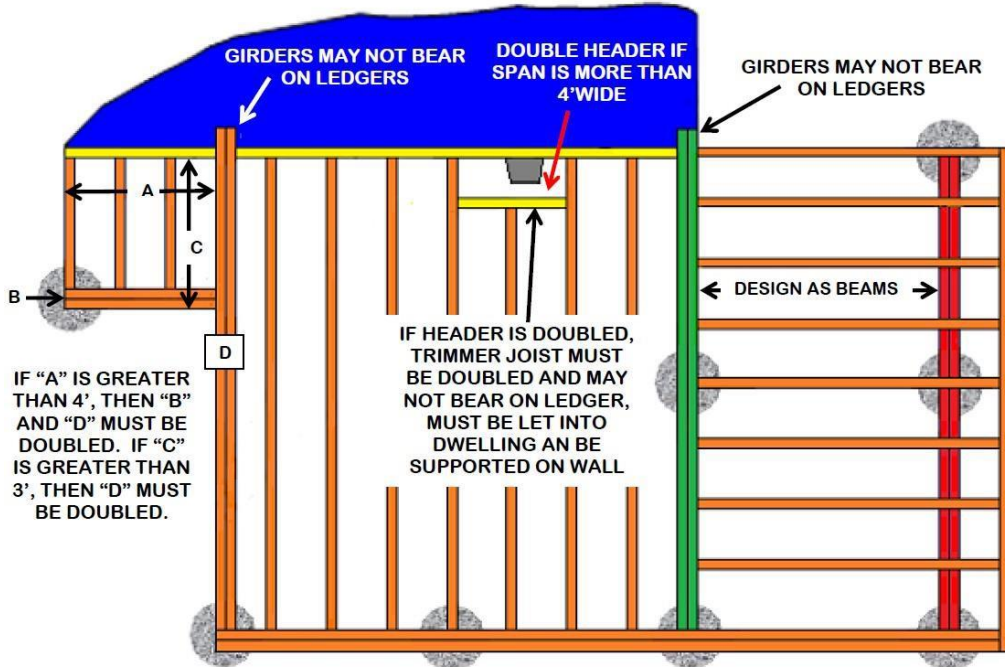
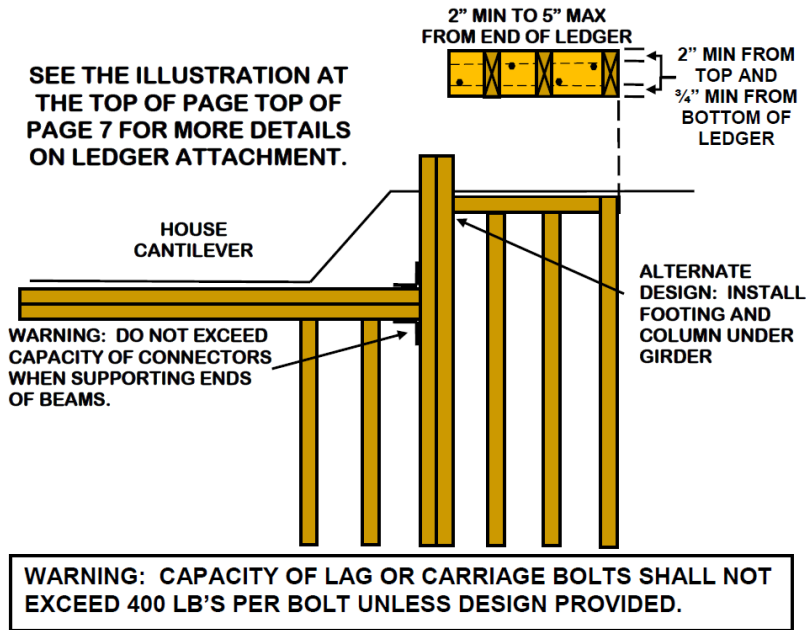
MAXIMUM CANTILEVER SPANS FOR JOISTS WITH BACKSPAN AT LEAST 2:1		
JOIST SIZE	SPACING O.C.	MAX. CANTILEVER
2X8	12"	39"
2X8	16"	34"
2X10	12"	57"
2X10	16"	49"
2X10	24"	40"
2X12	16"	67"
2X12	24"	54"

CANTILEVERS

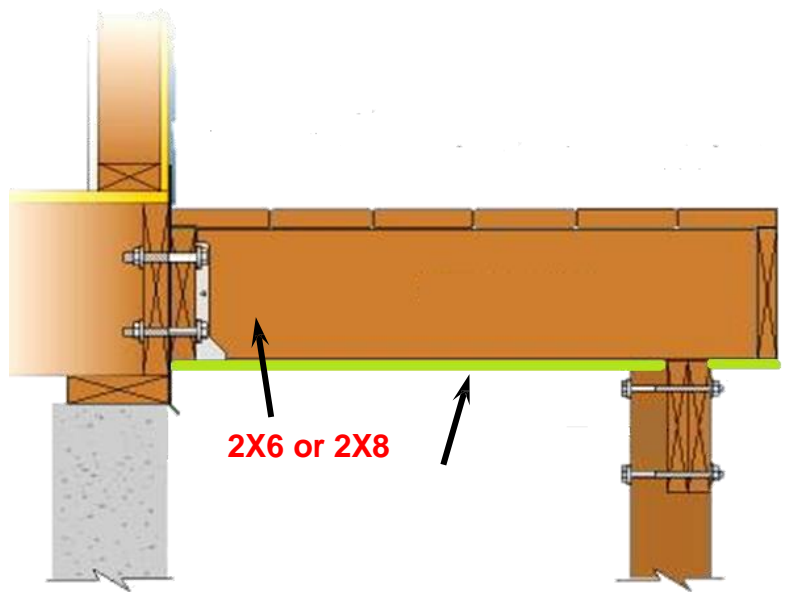
THE AMOUNT OF CANTILEVER IS LIMITED BY THE SIZE AND SPACING OF THE JOIST AND THE LENGTH OF THE BACKSPAN



SPECIAL FLOOR FRAMING DETAILS



NOTE: Some Composite deck manufacturers prohibit the use of their product with a ceiling

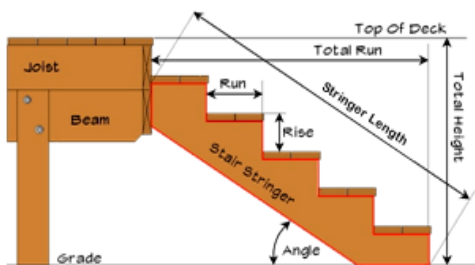


STAIRS

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.

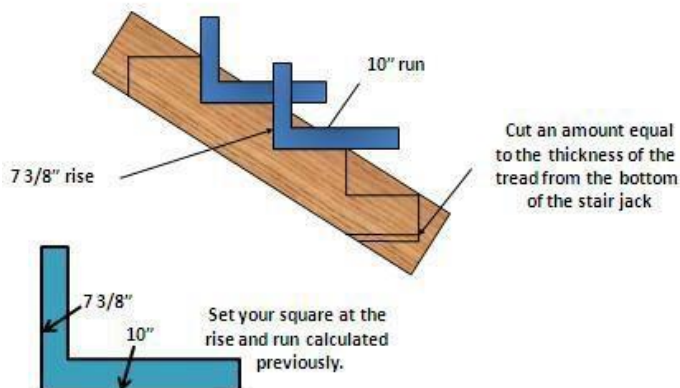
STAIR TERMINOLOGY



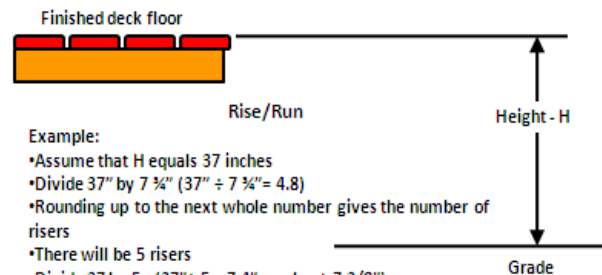
Stair Basics

- 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.

LAYING OUT STAIR JACKS



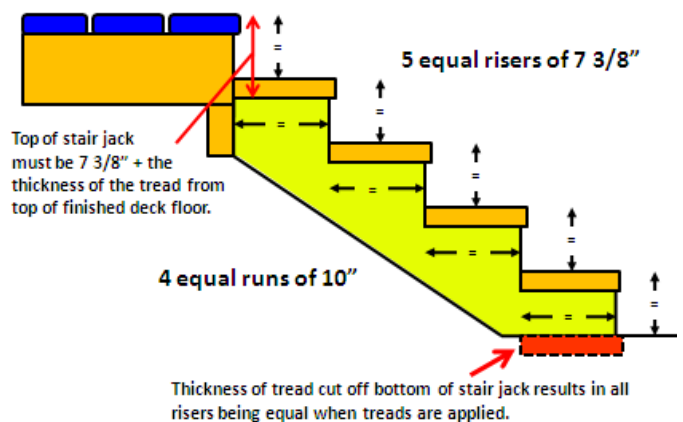
DETERMINING RISE/RUN

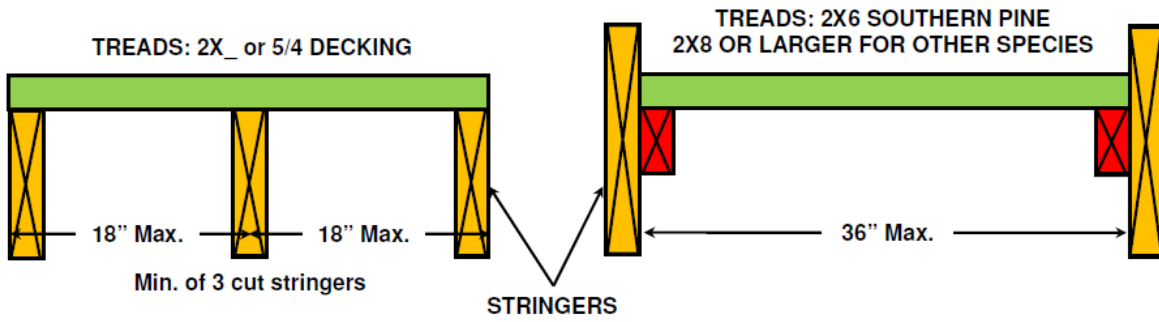


Example:

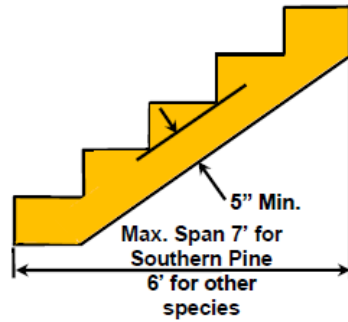
- Assume that H equals 37 inches
- Divide 37" by $7 \frac{3}{4}$ " ($37 \div 7 \frac{3}{4} = 4.8$)
- Rounding up to the next whole number gives the number of risers
- There will be 5 risers
- Divide 37 by 5. ($37 \div 5 = 7.4$ " or about $7 \frac{3}{8}$ ")
- Each riser will be $7 \frac{3}{8}$ "
- For 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

THE COMPLETED STAIR

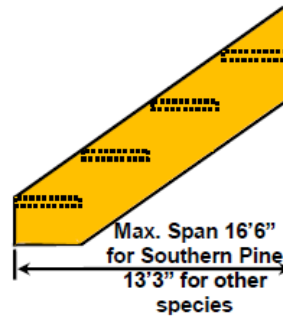




STAIR STRINGER SPANS
LANDINGS OR COLUMNS AND BEAMS MAY BE USED TO SHORTEN STRINGER SPANS

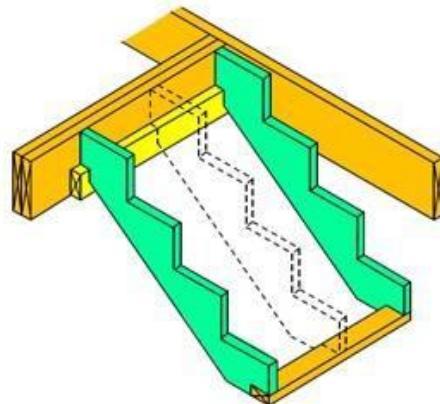
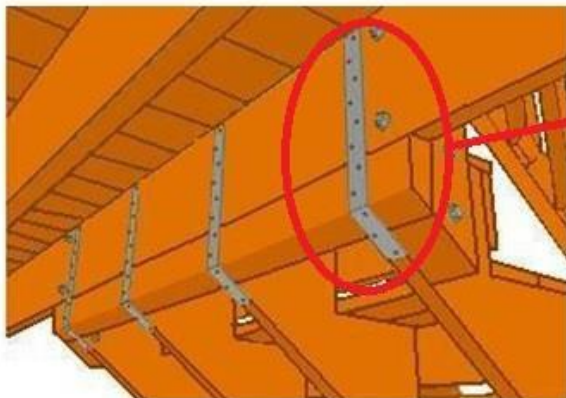
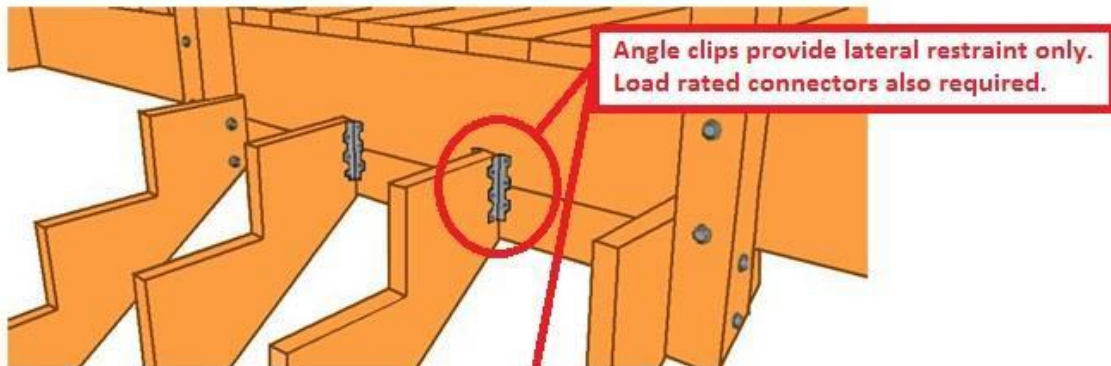


CUT STRINGER



SOLID STRINGER

STAIR ATTACHMENTS



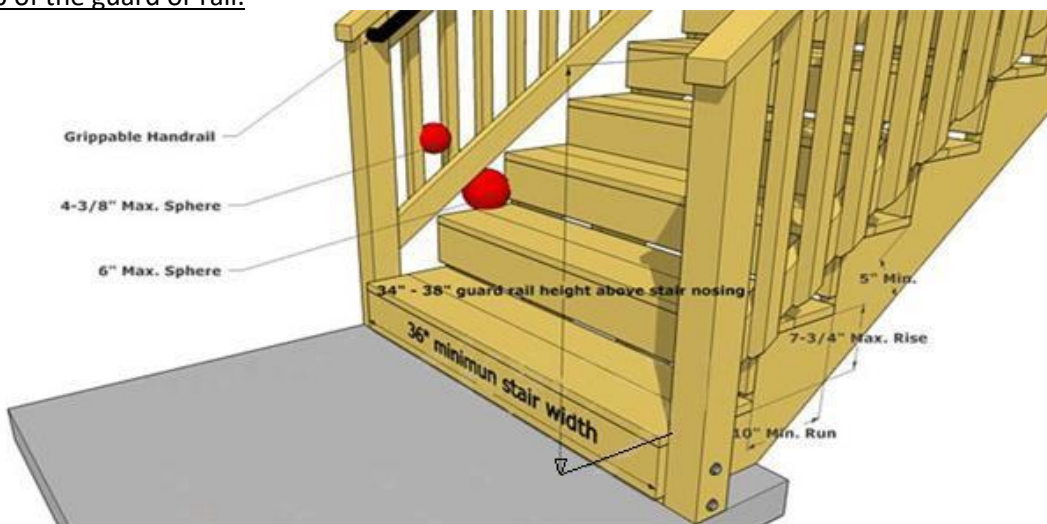
GUARDS AND HANDRAILS

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

Handrails must be provided on at least one side when there are four or more risers. Handrails must have returns on each end or terminate in a newel post. Other handrail shapes having an equivalent gripping shape may be used with prior approval of the Building Department.

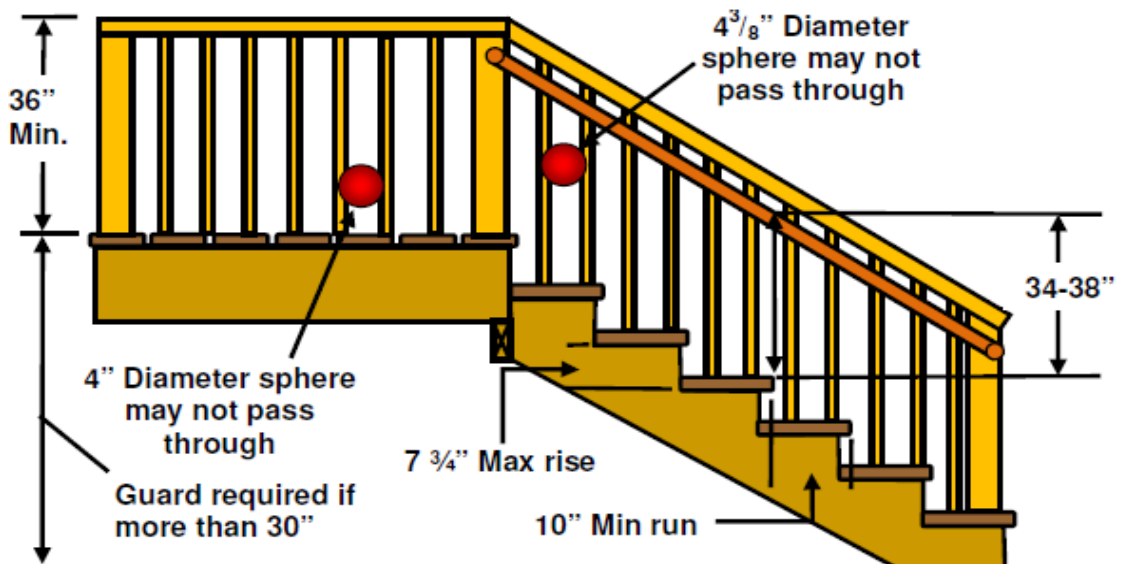
Handrails must be continuous for the entire length of the stairs and may not be interrupted by newel posts except at landings.

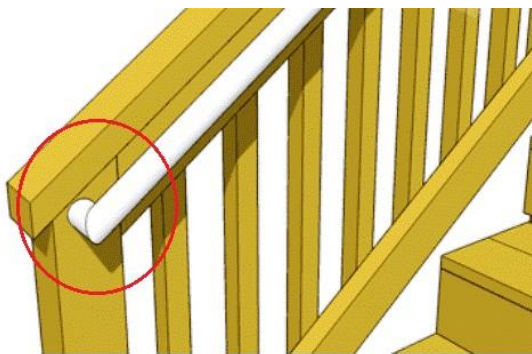
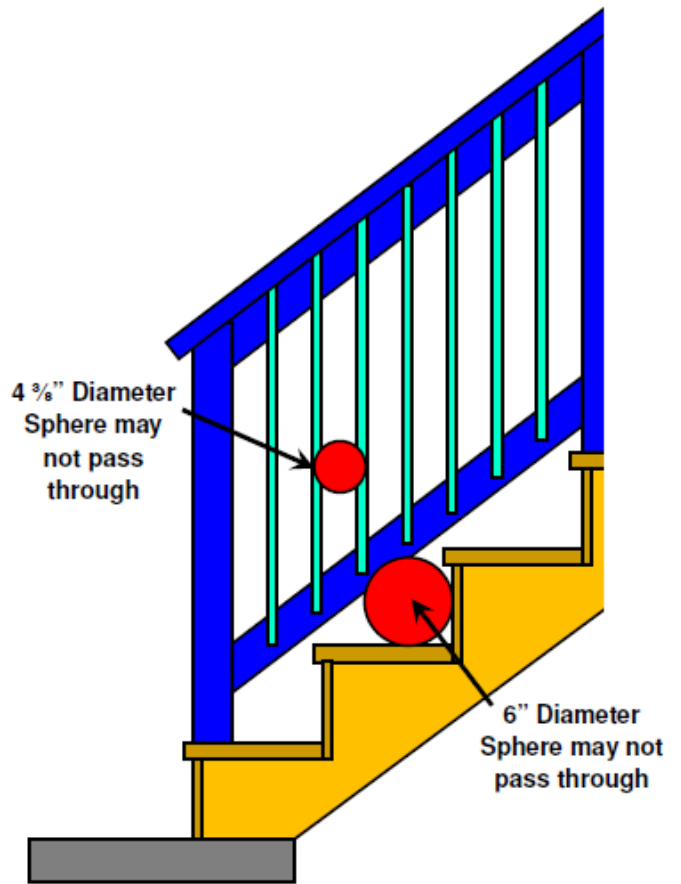
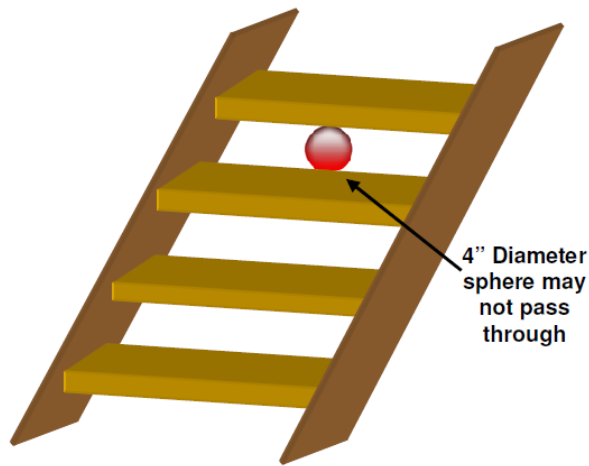
Hand rails and guards must be designed to support a 200 lb. load applied in any direction at any point along the top of the guard or rail.



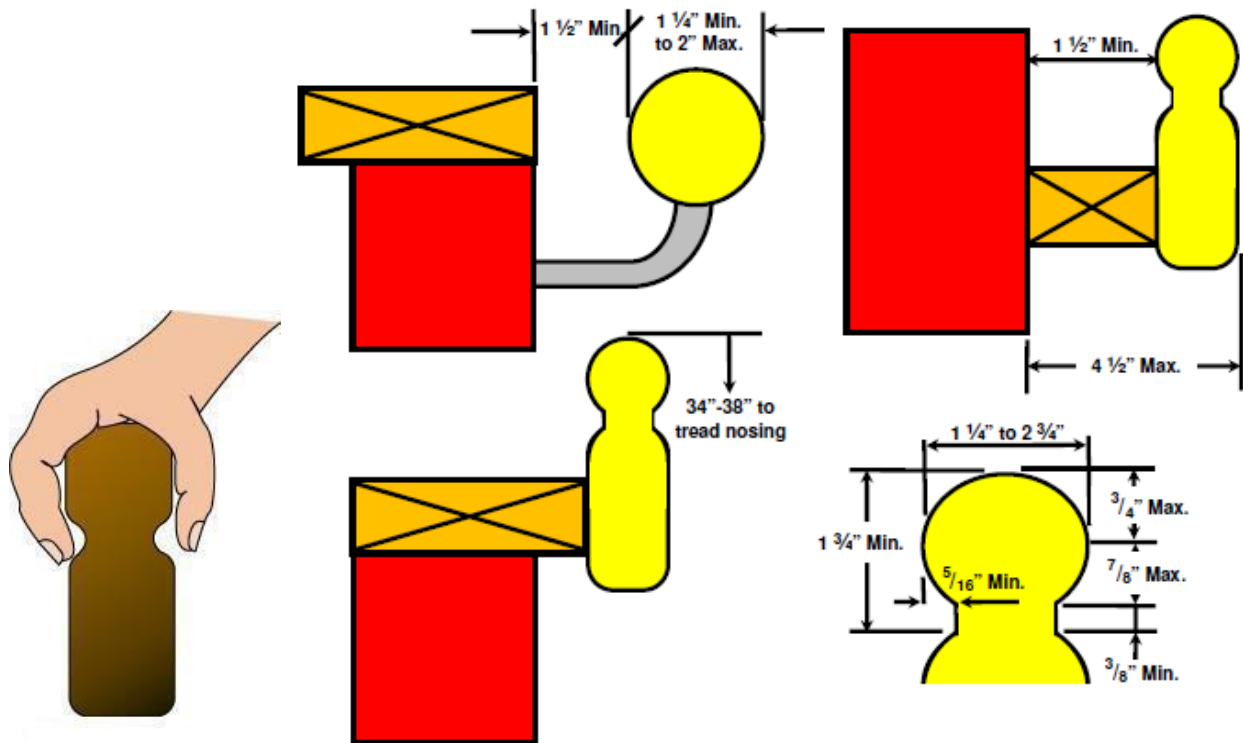
LANDING SHALL SPAN FULL WIDTH OF STAIRS & EXTEND A MINIMUM OF 36 INCHES IN THE DIRECTION OF TRAVEL.

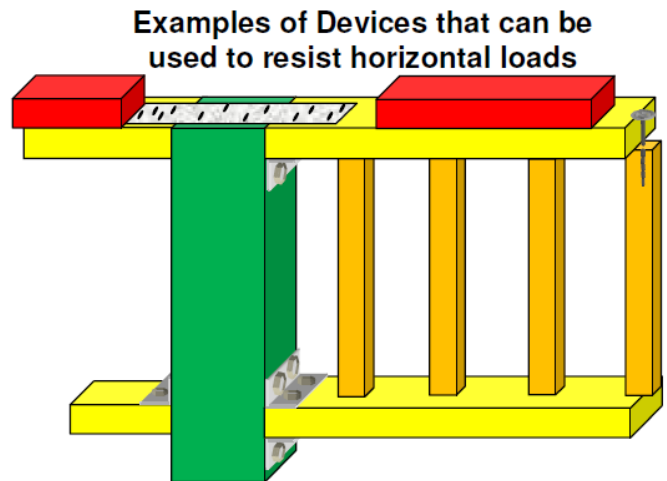
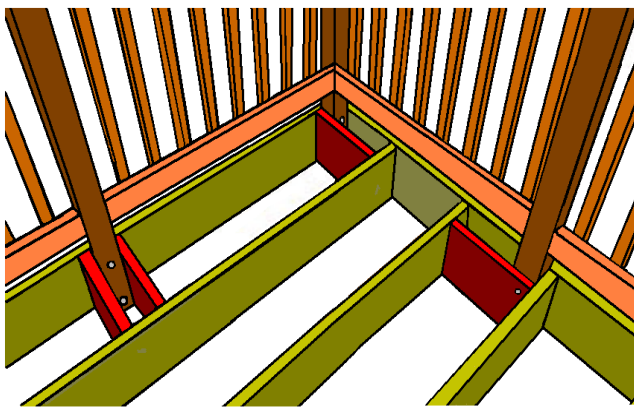
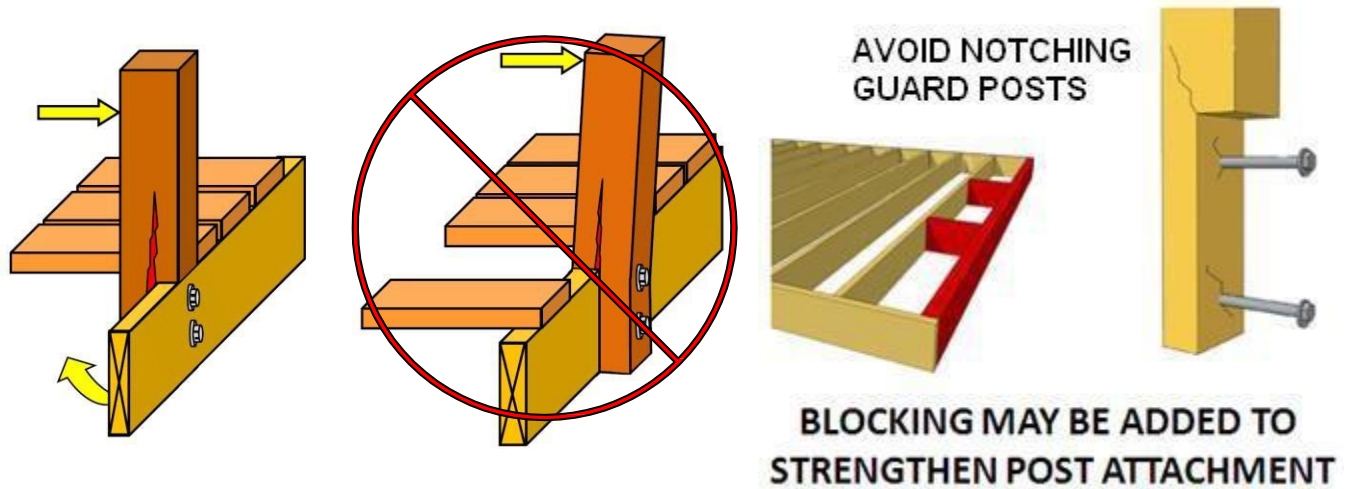
STAIRS MUST BEAR ON STRUCTURAL MATERIAL (i.e. treated lumber, concrete, gravel) AND BE PERMANENTLY RESTRAINED FROM LATERAL MOVEMENT.





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.