DECKS

Building Inspections Department
7071 University Ave N.E., Fridley, MN 55432
Phone: 763-572-3604 | Email: BuildingInspections@fridleymn.gov
www.fridleymn.gov

BUILDING PERMITS

Building permits are required for decks with the following exception: freestanding decks, regardless of size, if they are not more than thirty inches (30") above adjacent grade.

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

Building permits can be obtained from the Building Inspections Department by filling out an application online and submitting your building plans. Building permits are typically processed within 1 to 10 business days from receipt of complete application/plans.

PERMIT EXPIRATION

If you suspend work on your deck for more than one hundred eighty (180) days from permit issuance or your last inspection, your permit may expire. If unforeseen circumstances delay construction, contact the Building Inspections Department regarding extensions by letter or email ***before*** your permit expires.

PLANS

The Building Inspections 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 built. Please follow the Deck Plan Worksheet (on the next page). Plans must be neat and be of a scale of at least ¼" = 1' Plans are reviewed for code compliance and a copy is returned to the applicant with notes to identify required corrections. ***PLEASE REVIEW THE PLANS WHEN THEY ARE RETURNED TO YOU SO THAT YOU WILL BE AWARE OF ANY CORRECTIONS NEEDED.***

INSPECTIONS

1. Call minimum 24 hours in advance for inspections.
2. Please have the permit number and type of inspection (ex. footing) ready
3. Footing Inspection - Holes dug, loose material/water removed.
4. Framing Inspection - Beams, joists, and stair risers (before decking is installed) are in place.
5. Final Inspection - All work complete and all stairs, handrails, and guards in place. ***Installation instructions for composite decking on site.***
6. If work is approved, the inspector will sign the inspection card and you may proceed with the next step.
7. 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 Inspection Department at 763-572-3604 if you have questions. If necessary, we will be happy to meet with you on the site to help resolve any concerns or problems.

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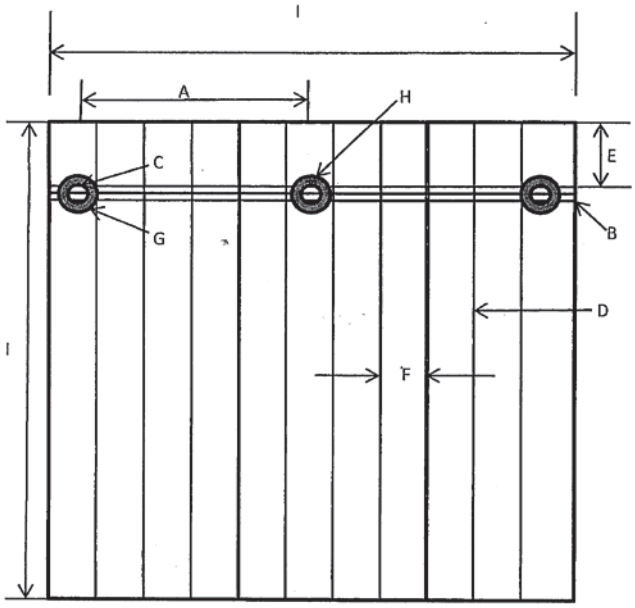
CITY OF Big Lake
www.biglakemn.org

DECK PLAN WORKSHEET



EXISTING HOUSE

FILL IN THE BLANKS:

A. Spacing in between posts _____

B. Beam size (2 – 2 x 10, etc.) _____

C. Post size (4 x 4; 6 x 6, etc.) _____

D. Joist length and size _____

E. Joist overhang _____

F. Spacing between joists (12", 16", or 24" O.C.) _____

G. Corner footing size _____

H. Intermediate footing size _____

I. Overall deck size _____

J. Type of material (cedar, treated, etc.) _____

K. Height above ground _____

L. Type of decking (5/4" x 6"; 2" x 6", etc.) _____

******A COMPLETE AND DETAILED PLAN WILL RESULT ******
IN A COMPLETE AND DETAILED PLAN REVIEW

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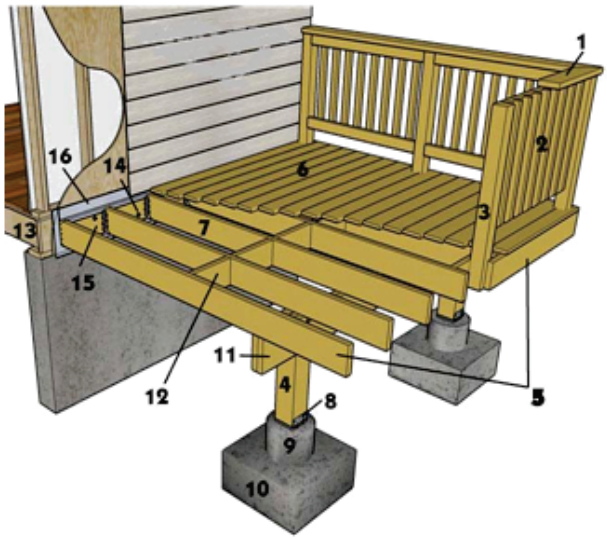
TERMINOLOGY

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



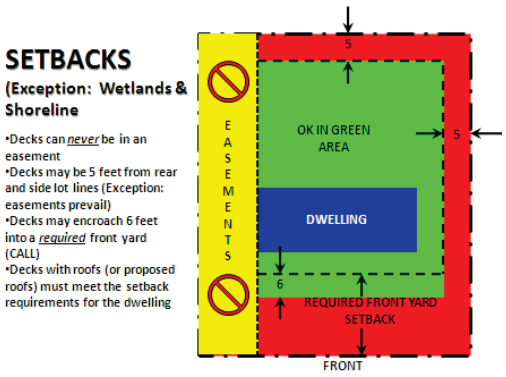
THINK YOU MIGHT ENCLOSE YOUR DECK IN THE FUTURE?

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 porches than for decks, it is important that you indicate on you 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. Decks must be at least three (3) feet from a side lot line and fifteen (15) feet from a rear property line. 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. ***Questions regarding zoning regulations should be directed to the Planning Department at 763-572-3595.***

SURVEY MARKER EXAMPLES



MATERIALS

Fasteners

Nails and timber rivets must be hot-dipped galvanized per ASTM A153, stainless steel, silicon bronze or copper.

Bolts and lag screws (including nuts and washers) must be hot-dipped galvanized per ASTM A153, Class C (Class D for 3/8-inch diameter or less) or mechanically galvanized per ASTM B695, Class 55 or 410 stainless steel, silicon bronze or copper.

Metal connectors must be ASTM A653 type G185 zinc coated galvanized steel or post hot-dipped galvanized per ASTM A123 providing a minimum average coating weight of 2.0 oz/ft (total both sides) or stainless steel.

Lumber

All wood used in deck construction shall be No. 2 grade or better, preservative-treated, or *approved*, naturally durable lumber and termite protected.

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 manufactured decking product.

Radius-edged Patio Decking (5/4 decking) has been specifically developed for outdoor decks. ***Redwood and cedar patio decking is intended to be used flat-wise in load-bearing applications where spans do not exceed 16" o.c. (12" o.c. when installed diagonally to joists). Southern pine decking may span 24" o.c. or 16" o.c. when installed diagonally to joists.***

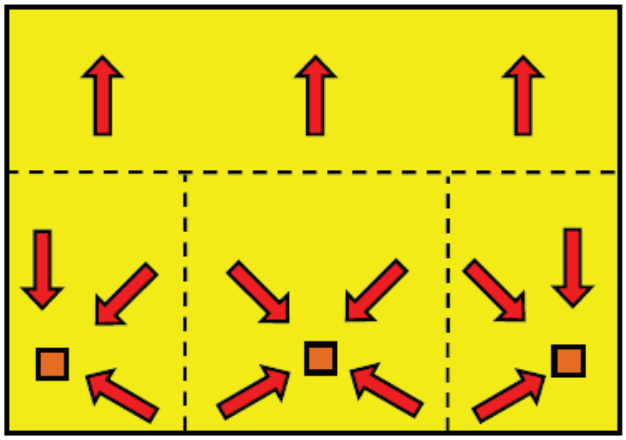
Manufactured decking products may be used only when approved by the Building Department. This approval is based on the material carrying an NER or similar report. Decking without a research report will not be approved. Ask the decking supplier to provide you with a copy of the research report. ***Caution – 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 DECK BOARD SPANS	PERPINDICULAR TO JOIST	DECKING DIAGONAL TO JOIST
1-1/4-INCH SOUTHERN PINE PERPENDICULAR TO JOIST	16" O.C.	12" O.C.
2-INCH THICK WOOD	24" O.C.	16" O.C.
PLASTIC COMPOSITE	SECTION R507.2	SECTION R507.2

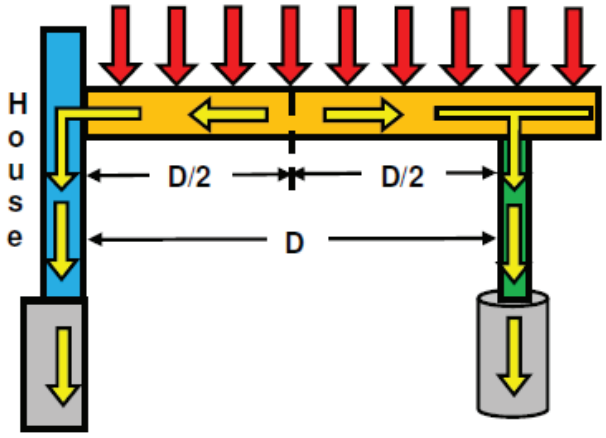
Call Gopher State One Call for utility locations at least two working days before you dig. Dial 811 or online at www.gopherstateonecall.org.

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

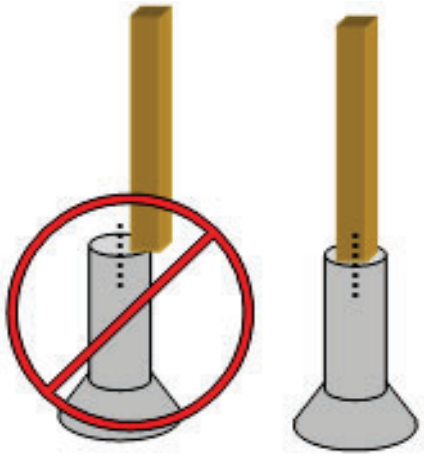


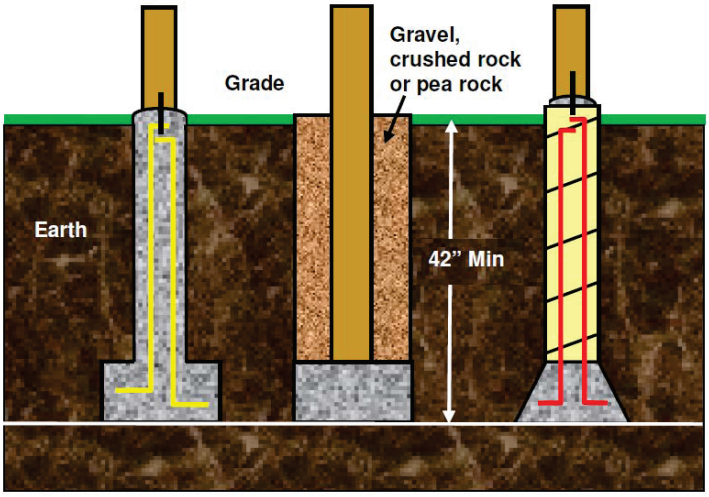
Deck footings should be sized according to the following table. Footings must extend ***at least 42 inches below grade*** (frost line) except for decks that are not connected to a dwelling.

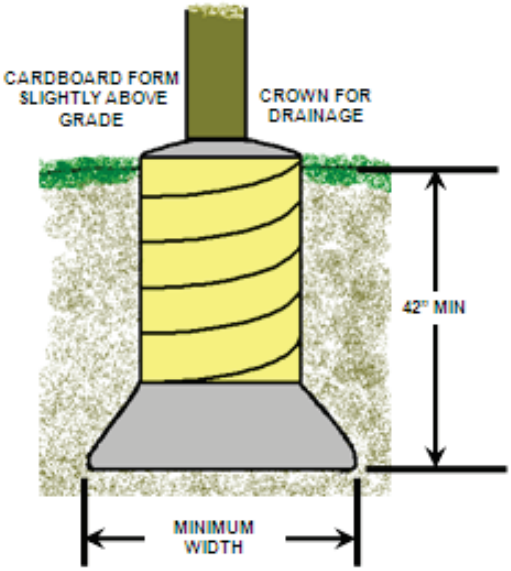
Deck Footing Sizes (2500 psf soils) – Not for use with hot tubs	
Tributary Area (sq. ft.)	**Diameter of a round footing (Inches)**
20	14
40	14
60	15
80	17
100	19
120	21
140	23
160	24

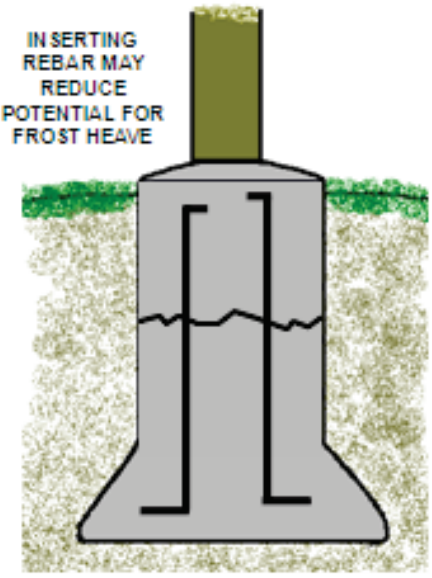
Required footing sizes are determined by calculating the area of the deck supported by each footing. Loads shall be assumed to be equally shared between the supporting elements. ***Don't overlook cantilevers.***

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

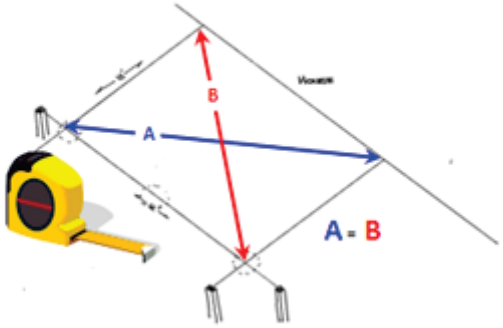




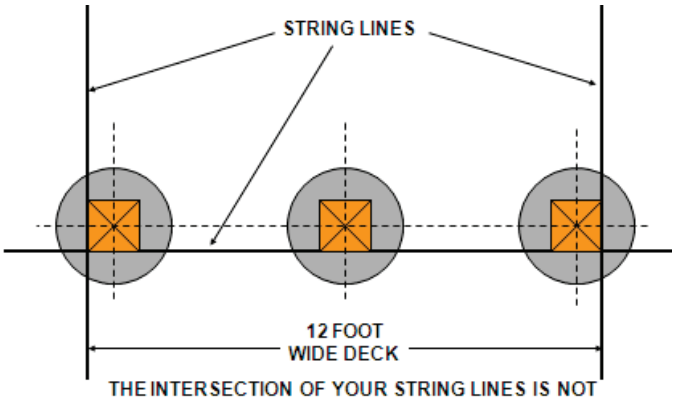




WHERE DO I PUT MY FOOTINGS?

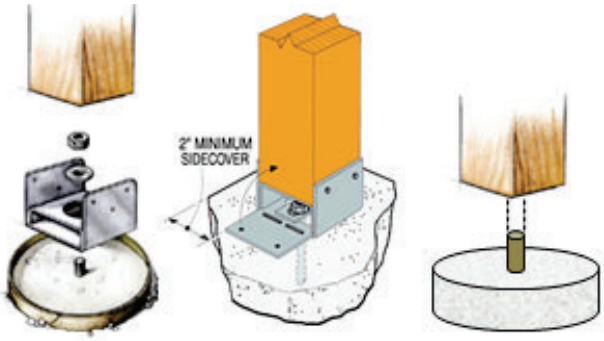


STRING LINES TO SQUARE DECK



THE INTERSECTION OF YOUR STRING LINES IS NOT THE CENTER OF THE FOOTING. ADJUST ACCORDING TO THE LOCATION AND SIZE OF YOUR COLUMN.

ANCHORING POST BASE



DECK FRAMING

Ledger Board

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

TABLE R507.2
FASTENER SPACING FOR A SOUTHERN PINE OR HEM-FIR DECK LEDGER AND A 2-INCH-NOMINAL SOLID-SAWN SPRUCE-PINE-FIR 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						
½-inch diameter lag screw with ½-inch maximum sheathing [b,c]	30	23	18	15	13	11	10
½-inch diameter bolt with ½-inch maximum sheathing [c]	36	36	34	29	24	21	19
½-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 ½-inch thickness of stacked washers shall be permitted to substitute for up to ½-inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

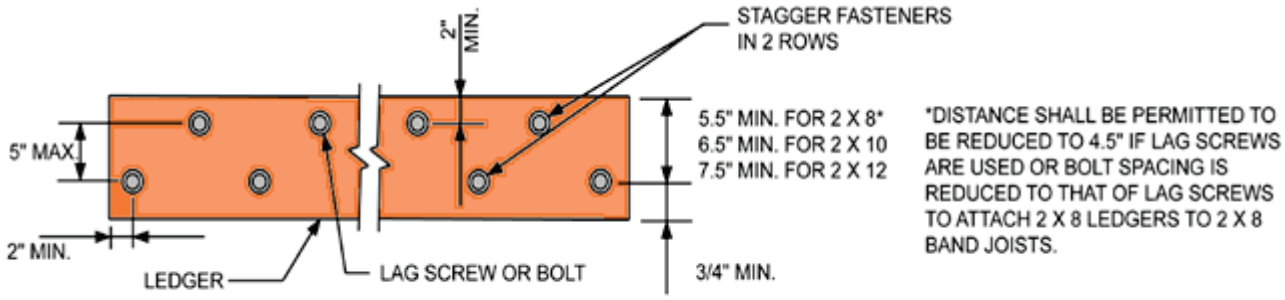


FIGURE R507.2.1(1)
PLACEMENT OF LAG SCREWS AND BOLTS IN LEDGERS

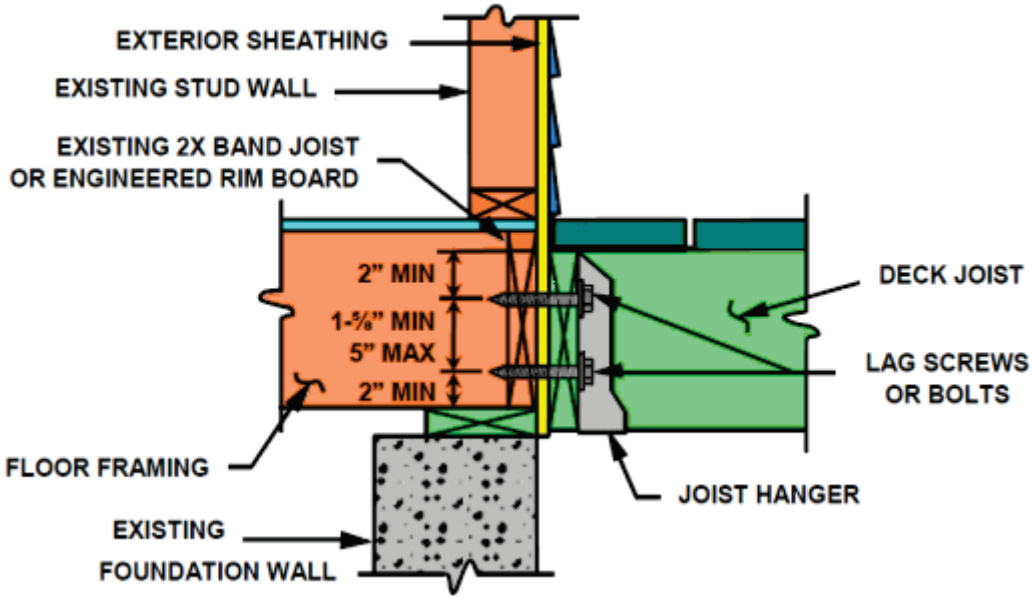
TABLE 507.9.1.3 (2)
PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS
MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS

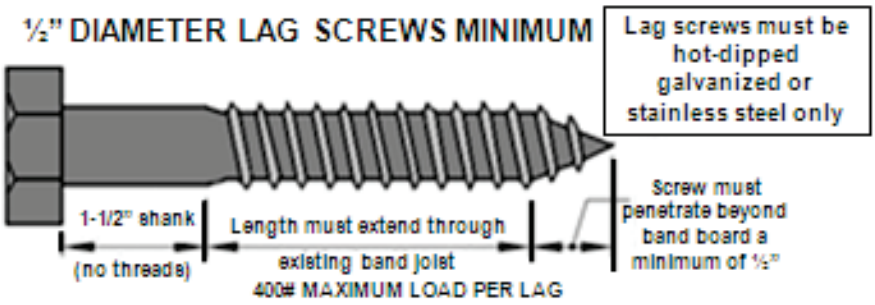
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Ledger [a]	2 inches [d]	¾ inch	2 inches [b]	1 5/8 inches [b]
Band Joist [c]	¾ inch	2 inches	2 inches [b]	1 5/8 inches [b]

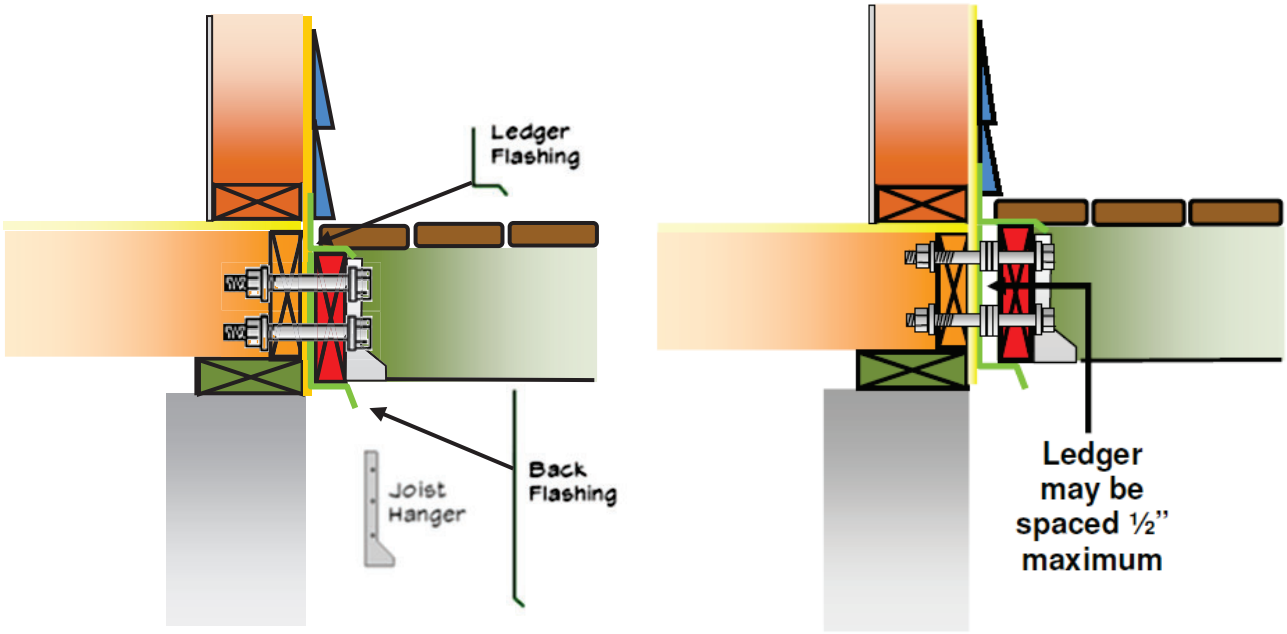
For SI: 1 inch = 25.4 mm.

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).

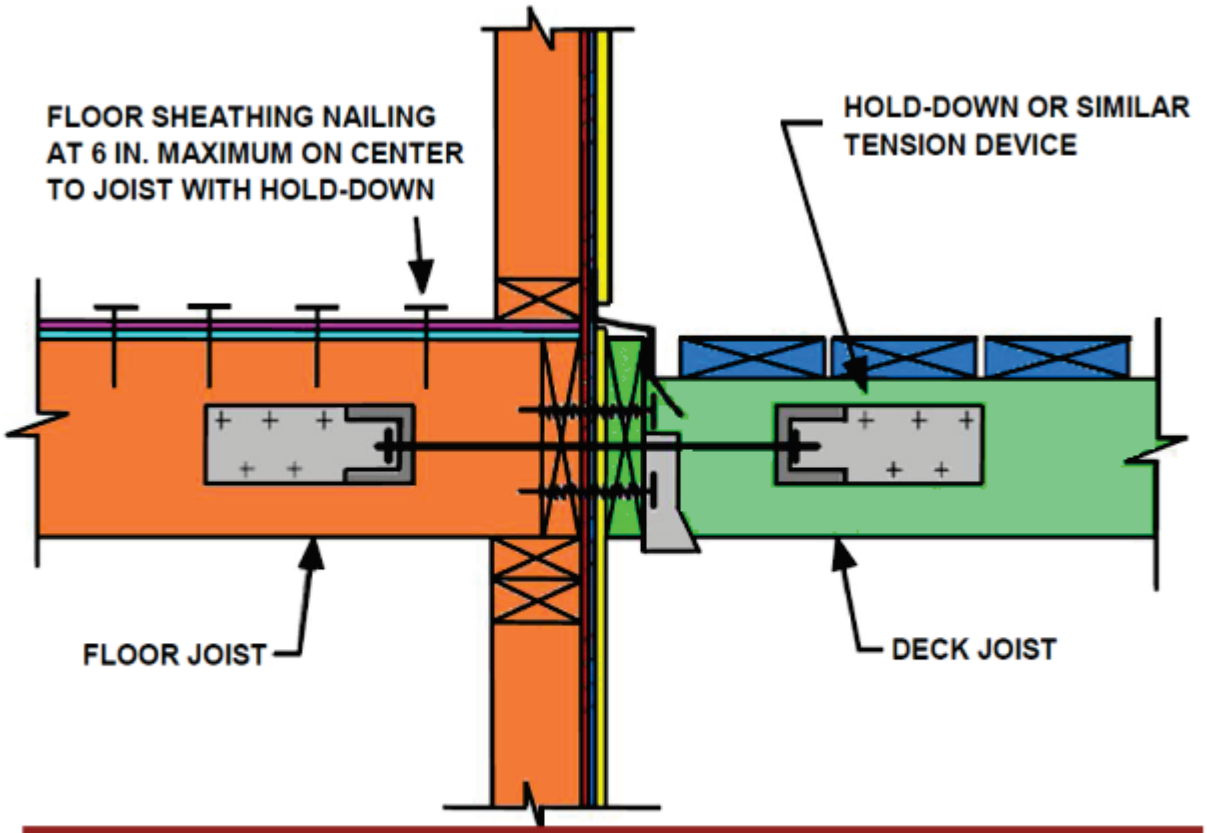
PLACEMENT OF LAG SCREWS AND BOLTS IN BAND JOISTS







HOLD-DOWN TENSION DEVICE



- 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.

BEAMS

Construct beams using two or more 2 inch nominal pieces of lumber. Nail beams together using 16d nails at 16 inches o.c. along each edge of the beam. 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. MBC TABLE R507.5

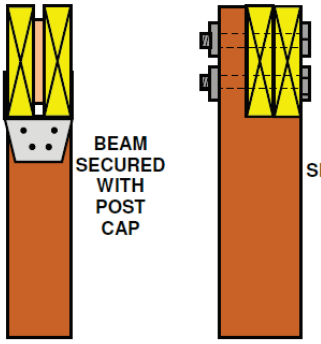
TABLE R507.5
DECK BEAM SPAN LENGTHS [a] [b] [g] (feet – inches)

SPECIES [c]	SIZE [d]	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern pine	1 – 2 X 6	4-11	4-0	3-7	3-3	3-0	2-10	2-8
	1 – 2 X 8	5-11	5-1	4-7	4-2	2-10	3-7	3-5
	1 – 2 X 10	7-0	6-0	5-5	4-11	4-7	4-3	4-0
	1 – 2 X 12	8-3	7-1	6-4	5-10	5-5	5-0	4-9
	2 – 2 X 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
	2 – 2 X 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
	2 – 2 X 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0
	2 – 2 X 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0
	3 – 2 X 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3 – 2 X 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
	3 – 2 X 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6
	3 – 2 X 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 X 6 or 2 – 2 X 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3 X 8 or 2 – 2 X 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 X 10 or 2 – 2 X 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3 X 12 or 2 – 2 X 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4 X 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 X 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 X 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 X 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3 – 2 X 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3 – 2 X 8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3 – 2 X 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3 – 2 X 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.

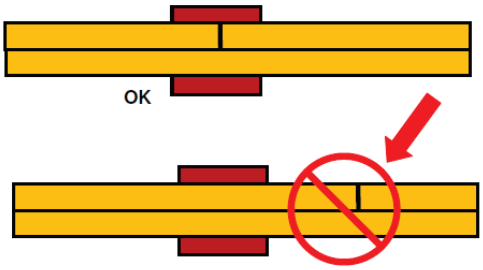
METHODS OF ATTACHING BEAM TO COLUMN

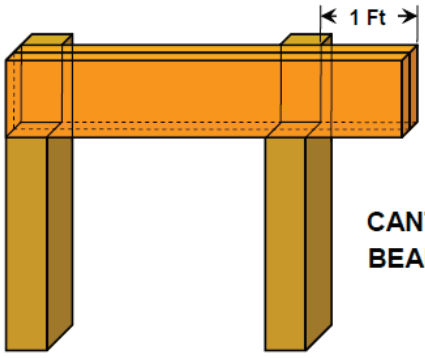


BEAM SECURED WITH POST CAP

BEAM SECURED WITH BOLTS TO NOTCHED COLUMN

BEAM SPLICES



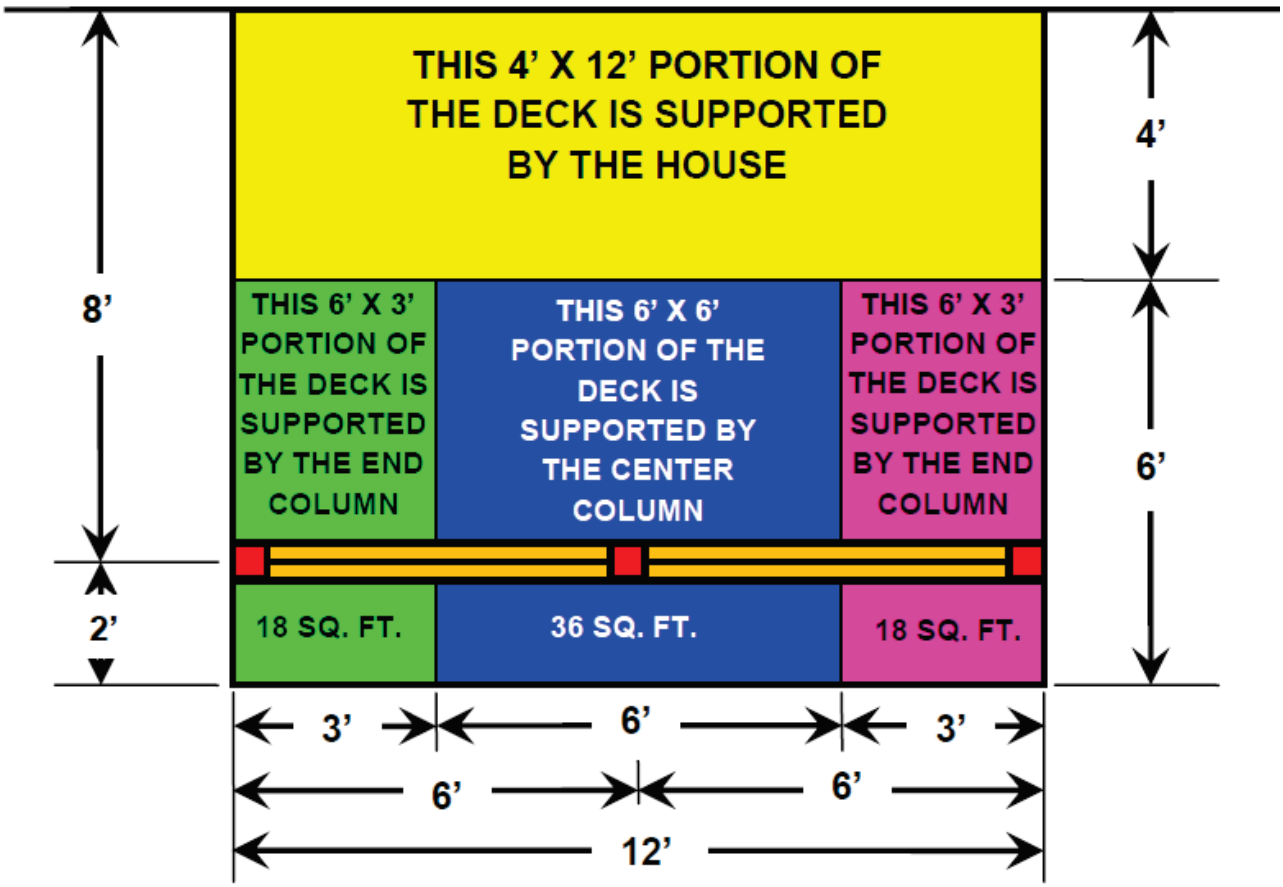


MAXIMUM CANTILEVER FOR A BEAM IS ONE FOOT

COLUMNS

DECK POST SIZE	MAXIMUM HEIGHT
4X4	6-9
4X6	8
6X6	14
8X8	14

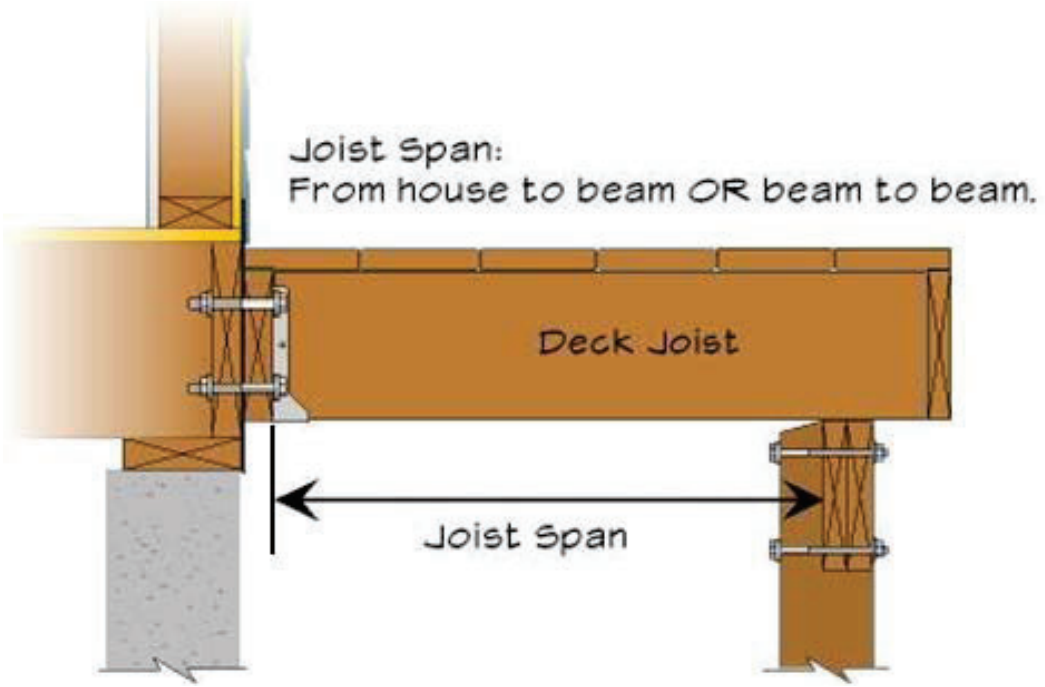
MEASURED TO THE UNDERSIDE OF THE BEAM.



JOISTS

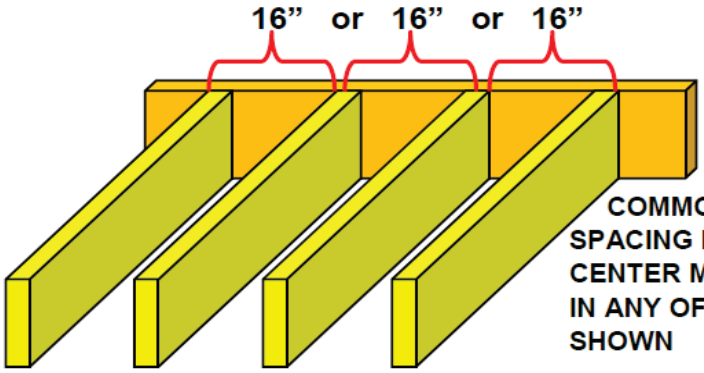
TABLE R507.6
DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. – in.)

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.
2 X 6	9-11	9-0	7-7	8-10	8-0	7-0
2 X 8	13-1	11-10	9-8	11-8	10-7	8-8
2 X 10	16-2	14-0	11-5	14-11	13-0	10-7
2 X 12	18-0	16-6	13-6	17-5	15-1	12-4

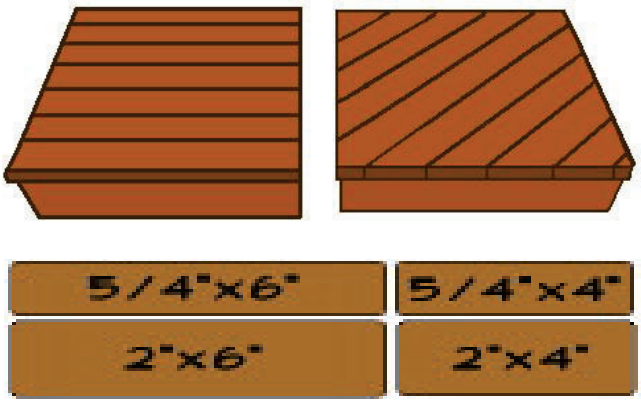


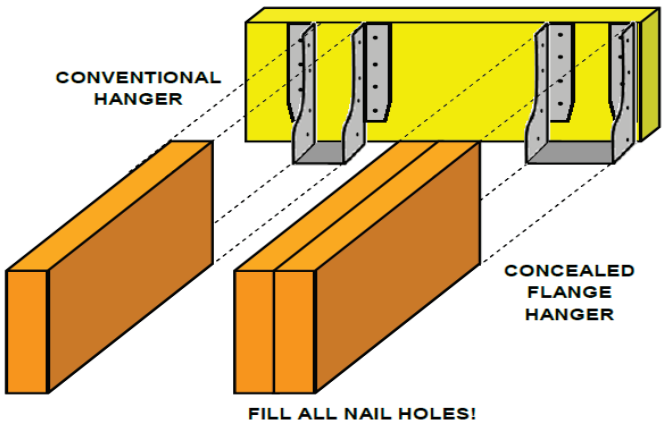
JOIST DETAILS

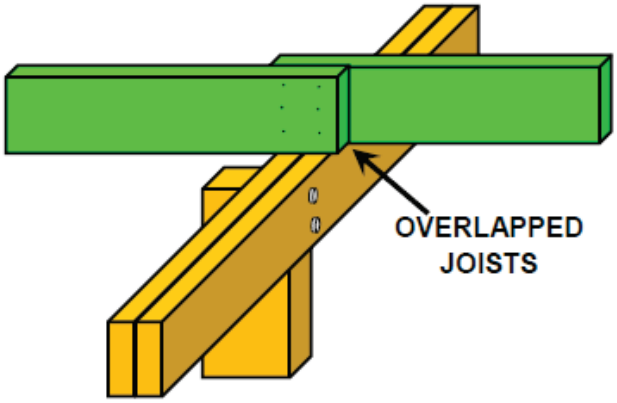
JOIST SPACING IS DETERMINED BY THE TYPE OF DECKING USED. 16" O.C. SPACING MUST BE USED WITH 5/4 DECKING OR WHEN 2X6 OR 2X4 DECKING IS USED AT A 45° ANGLE. 12" O.C. SPACING REQUIRED WHEN 5/4 DECKING IS USED AT A 45° ANGLE.

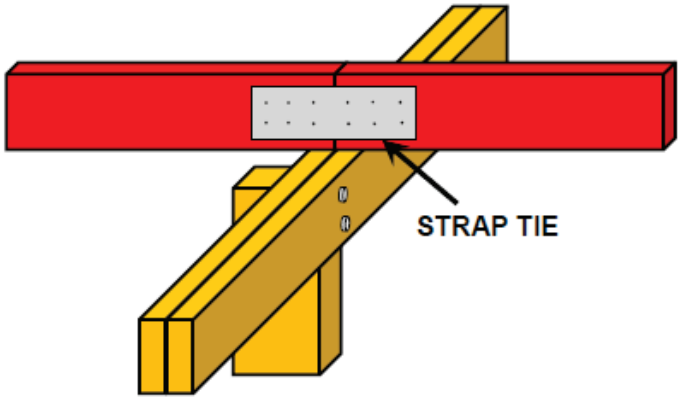


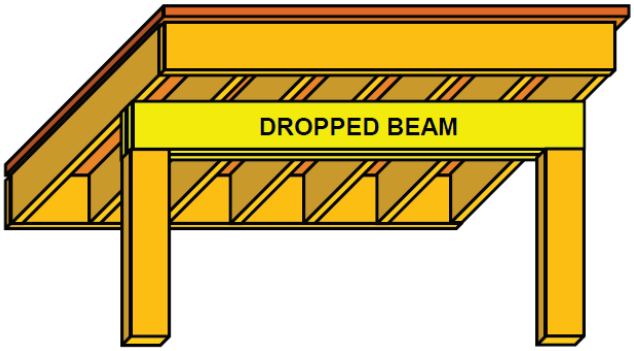
COMMON JOIST SPACING IS 16" ON CENTER MEASURED IN ANY OF THE WAYS SHOWN

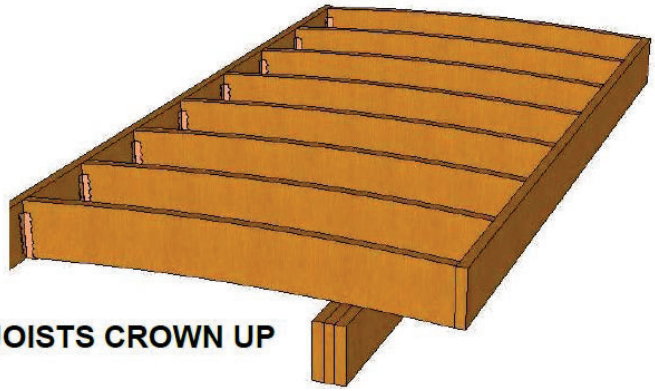


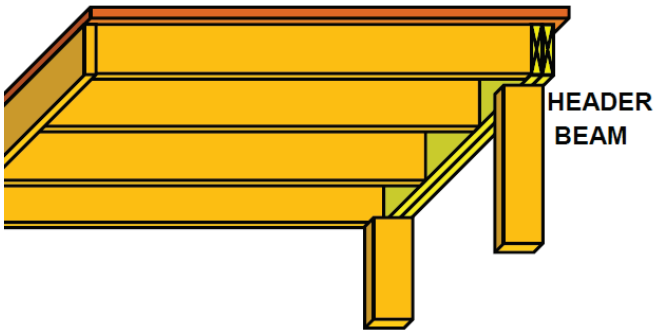




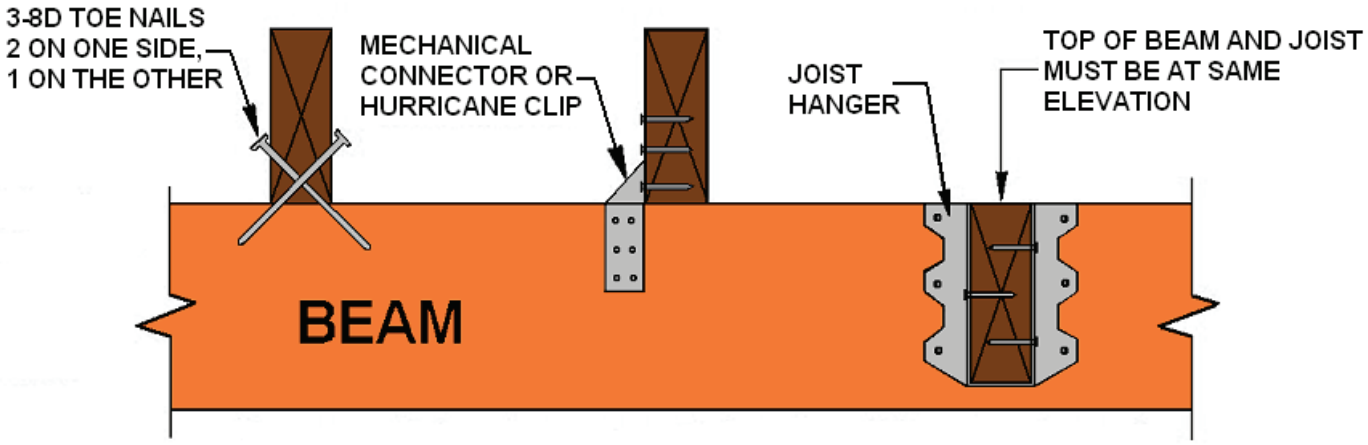




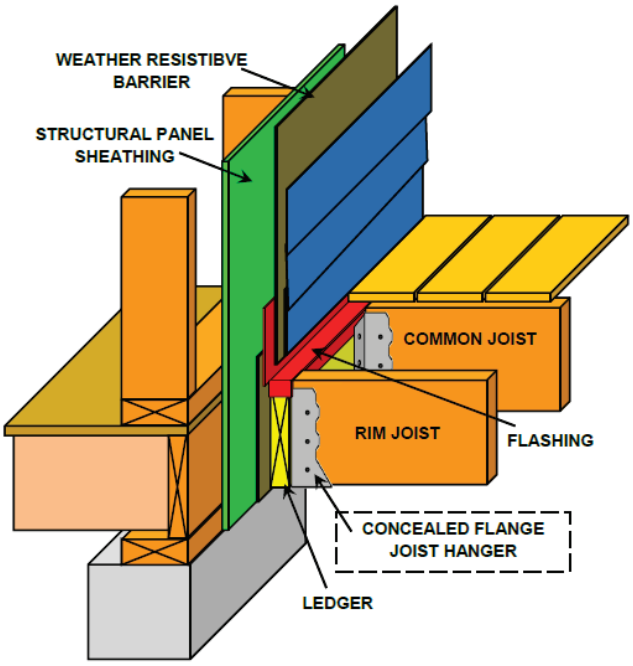




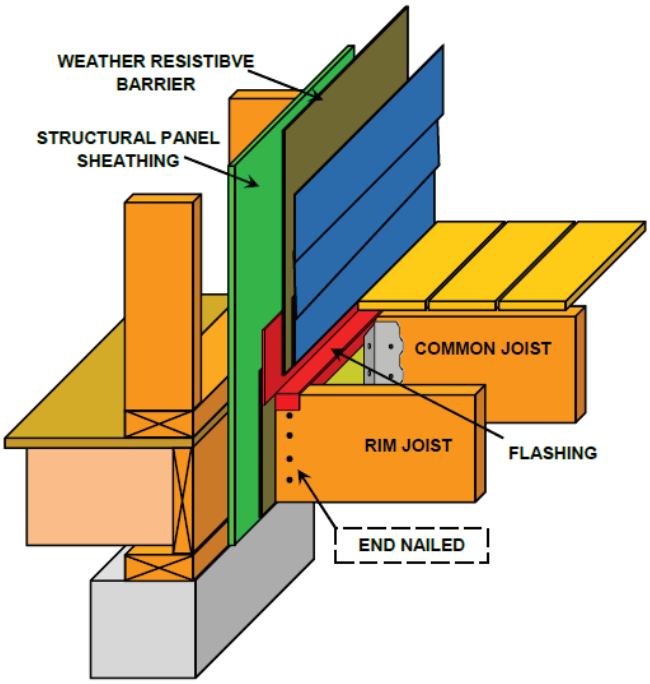
JOIST TO BEAM ATTACHMENTS



RIM JOIST ATTACHED TO LEDGER WITH CONCEALED FLANGE HANGER



RIM JOIST ATTACHED TO LEDGER BY END NAILING

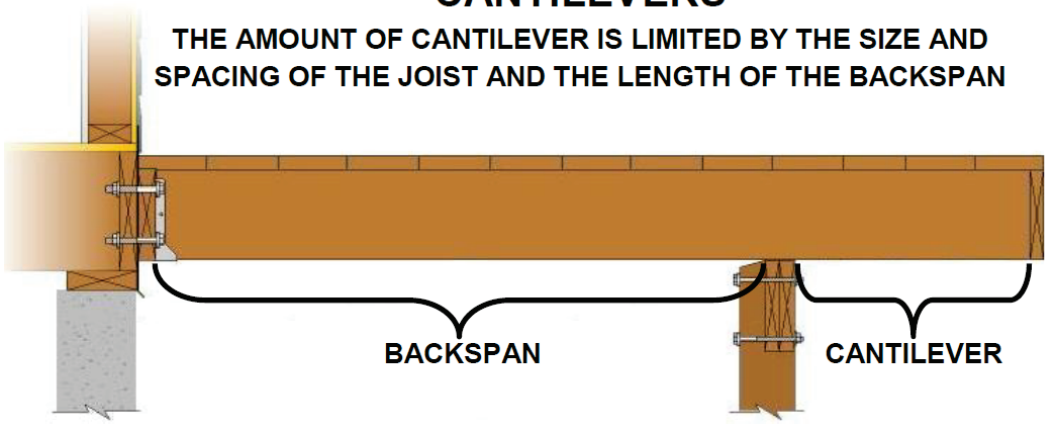


MAXIMUM CANTILEVER SPANS FOR JOISTS WITH BACKSPAN AT LEAST 2:1		
JOIST SIZE	**SPACING O.C.**	**MAX. CANTILEVER**
2 X 8	12″	2-1
2 X 8	16″	2-3
2 X 10	12″	3-4
2 X 10	16″	3-6
2 X 10	24″	2-10
2 X 12	16″	4-2
2 X 12	24″	3-4

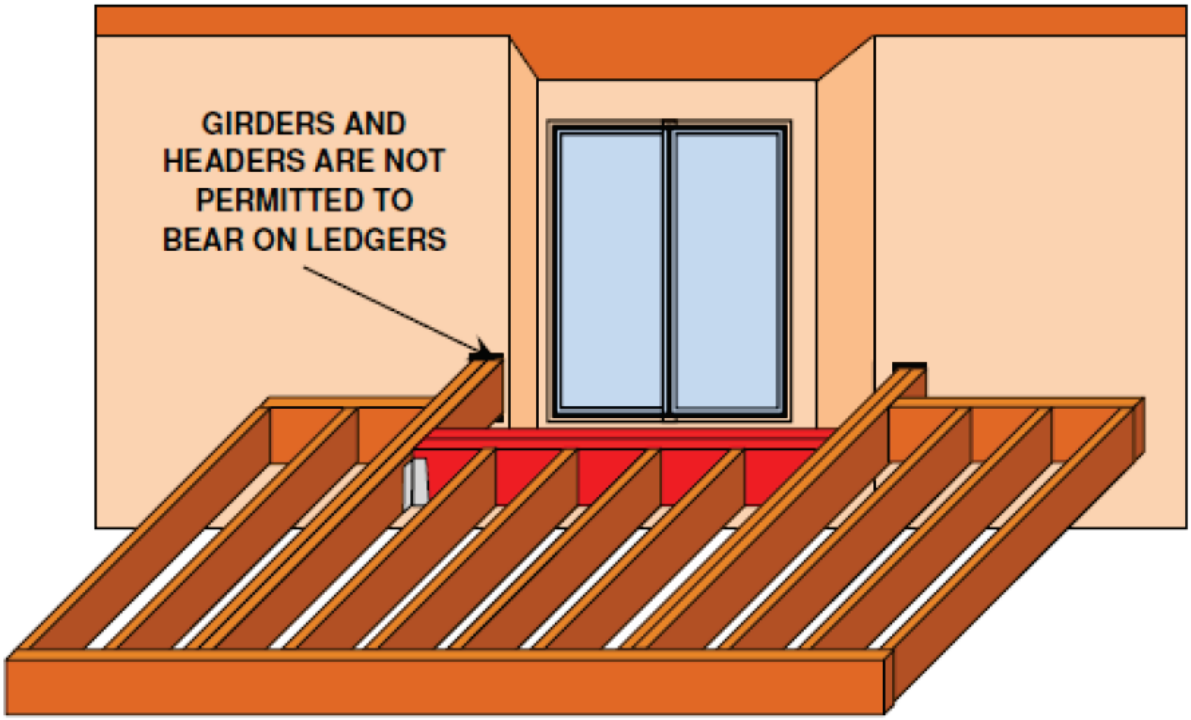
Joists must bear on a beam, ledger strip, or joist hangers. Joist hangers must be installed in accordance with the manufacturer's recommendations. ***Fill all nail holes in joist hangers.***

CANTILEVERS

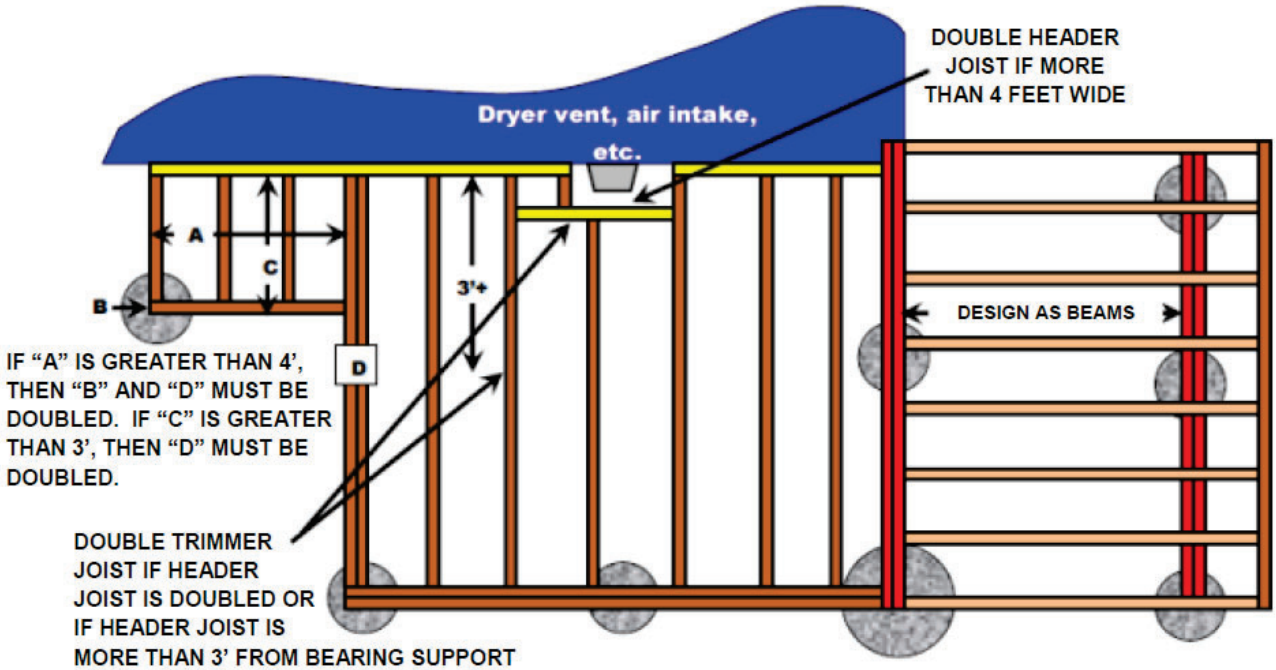
THE AMOUNT OF CANTILEVER IS LIMITED BY THE SIZE AND SPACING OF THE JOIST AND THE LENGTH OF THE BACKSPAN



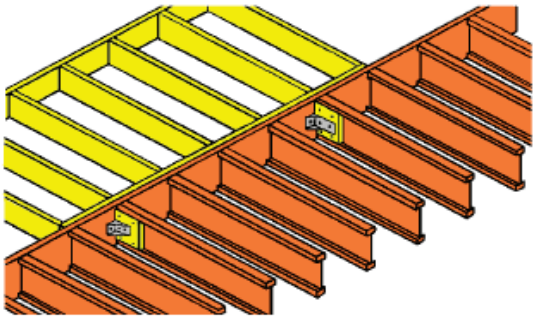
HOUSE CANTILEVERS

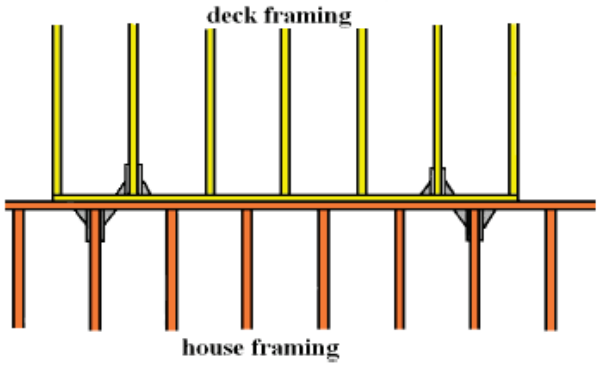


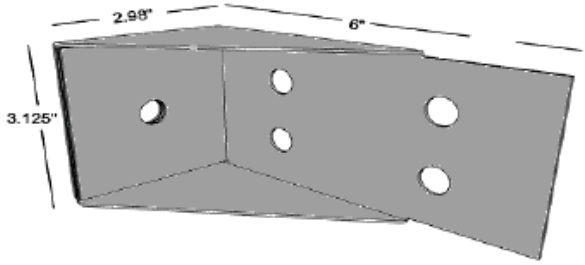
SPECIAL FLOOR FRAMING DETAILS



DECK ATTACHMENTS TO I-JOIST OR TRUSS FLOOR SYSTEMS

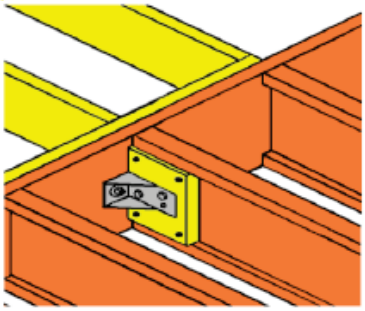


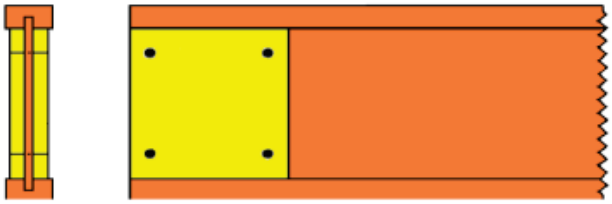


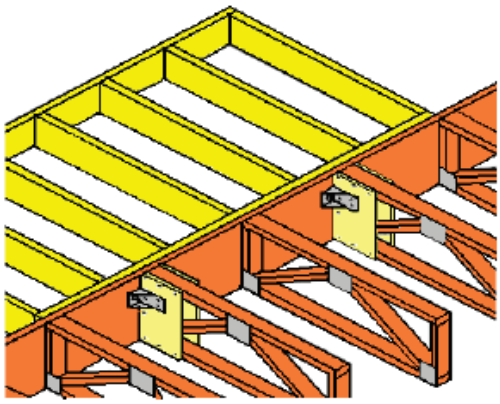


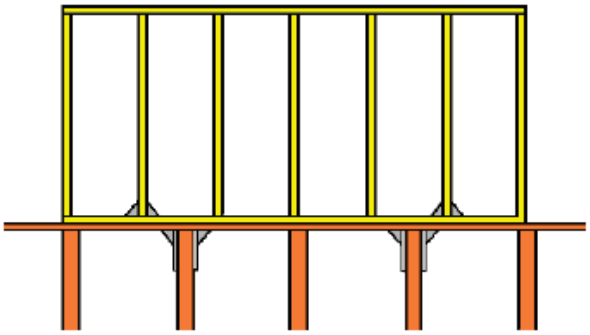
INSTALL CONNECTOR IN ACCORDANCE WITH MANUFACTURERE'S INSTALLATION INSTRUCTIONS

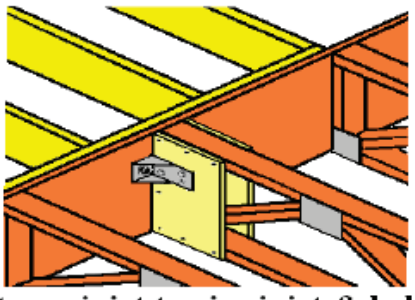
RULES UNDER STATE CONSIDERATION MAY REQUIRE DECKS ATTACHMENTS TO FLOORS CONSTRUCTED OF I-JOISTS OR TRUSSES BE DESIGNED.



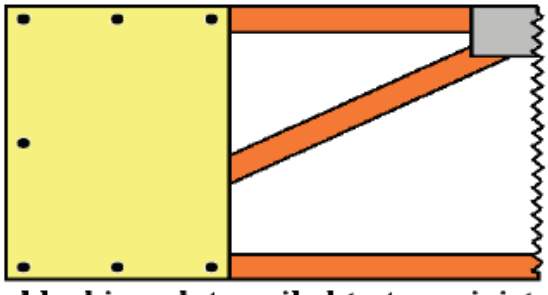








truss joist to rim joist & ledger



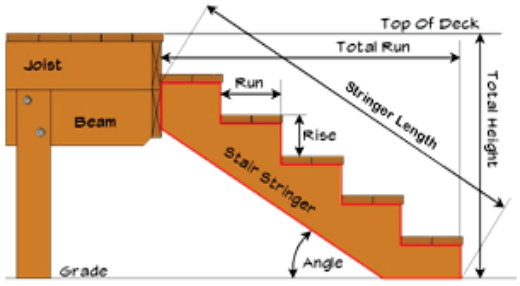
blocking plate nailed to truss joist

STAIRS

Stairs must have a maximum rise of 7 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 ⅜ inch. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than ⅜ 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.

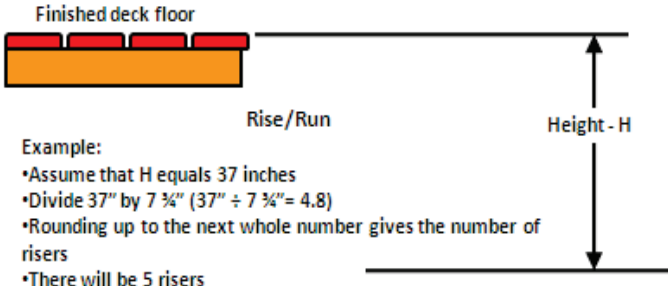
STAIR TERMINOLOGY



Stair Basics

- The maximum riser height is 7 ¾ 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 ⅜ inch.

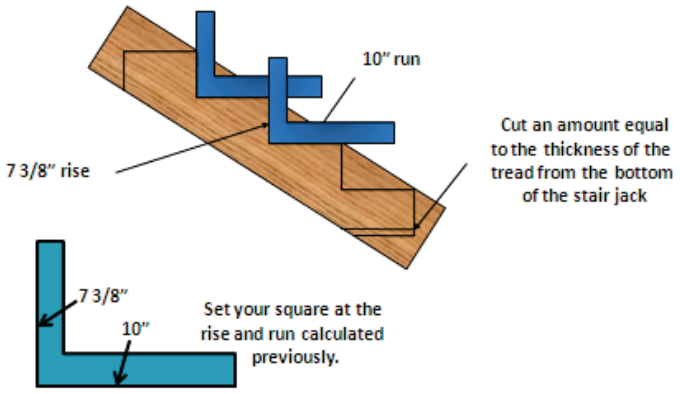
DETERMINING RISE/RUN



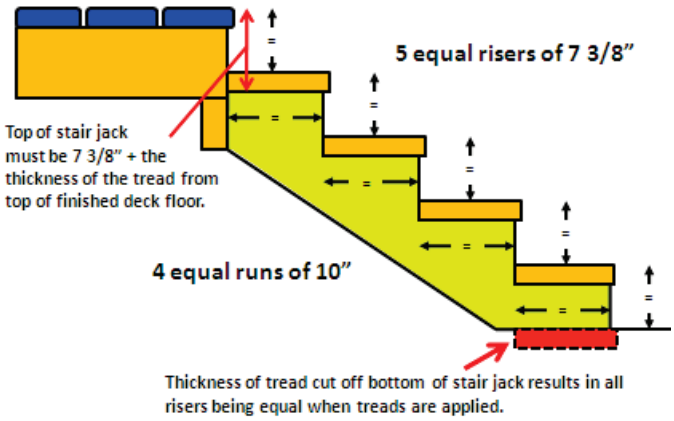
Example:

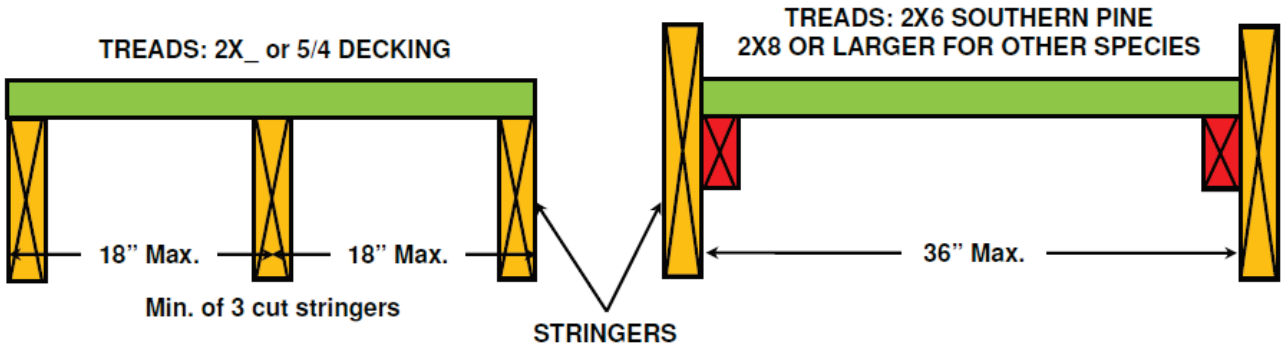
- Assume that H equals 37 inches
- Divide 37" by 7 ¾" (37" ÷ 7 ¾"= 4.8)
- Rounding up to the next whole number gives the number of risers
- There will be 5 risers
- Divide 37 by 5. (37"÷ 5 = 7.4" or about 7 3/8")
- Each riser will be 7 3/8"
- For 5 risers there will be 4 treads
- Since each tread must 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" X 4 treads = 40")

LAYING OUT STAIR JACKS



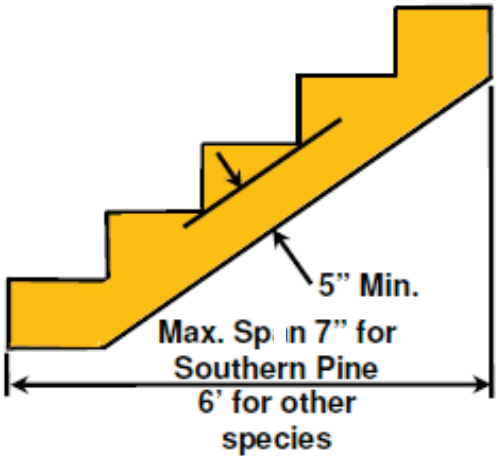
THE COMPLETED STAIR



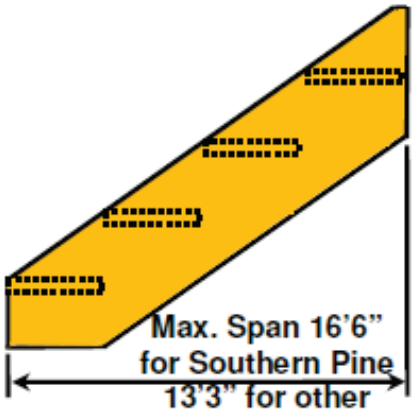


STAIR STRINGER SPANS

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

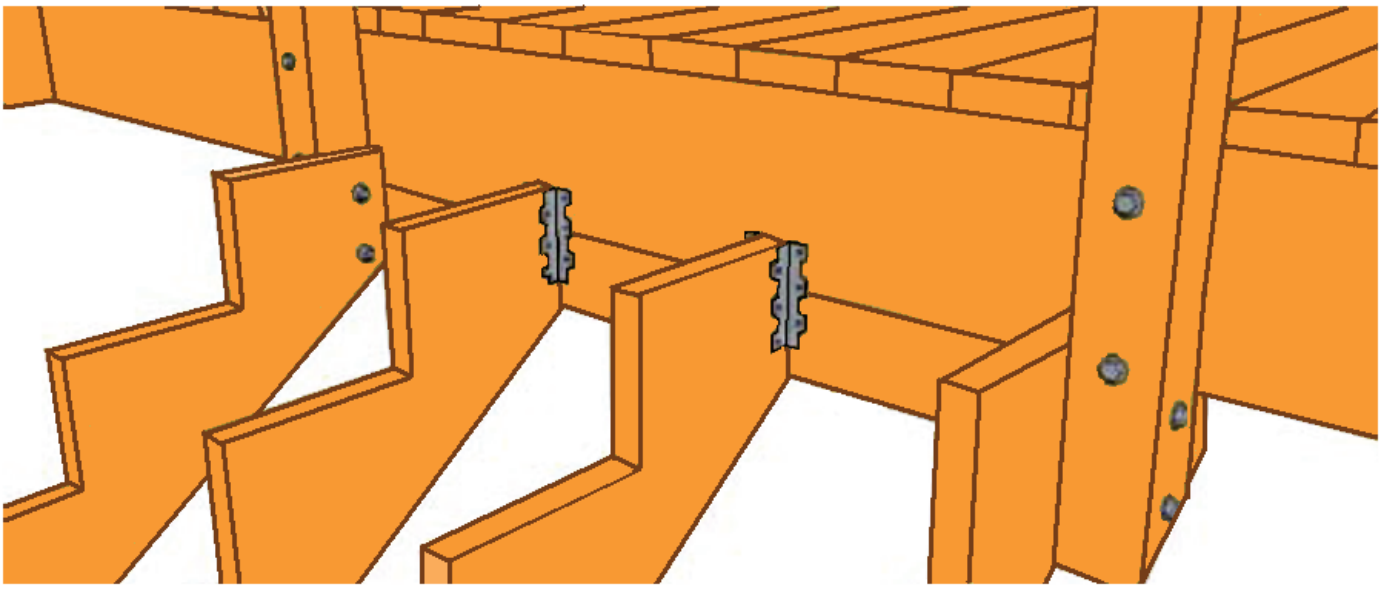


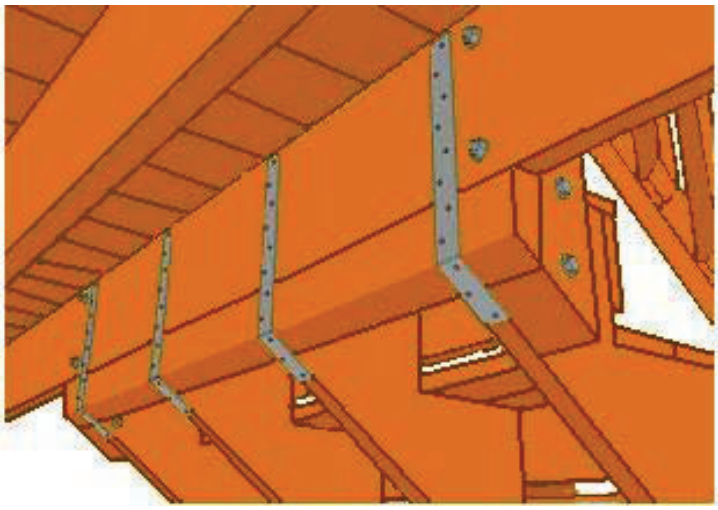
CUT STRINGER

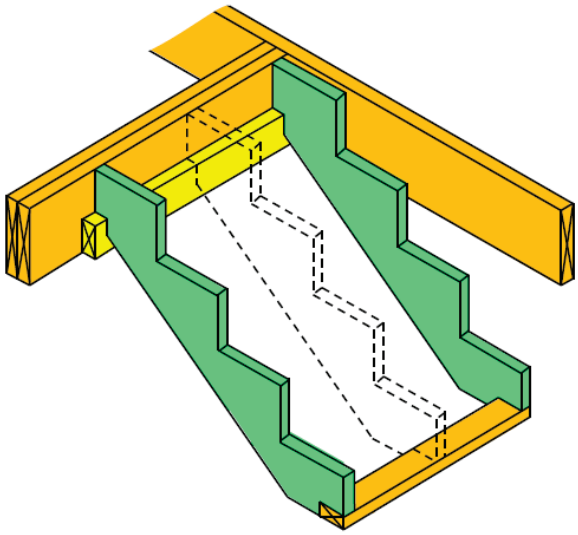


SOLID STRINGER

STAIR ATTACHMENTS







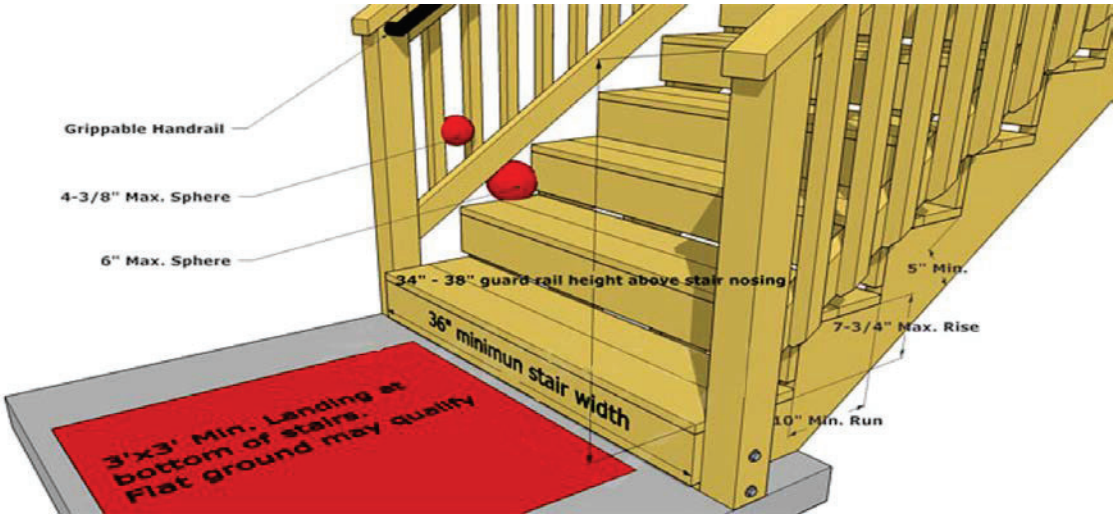
GUARDS AND HANDRAILS

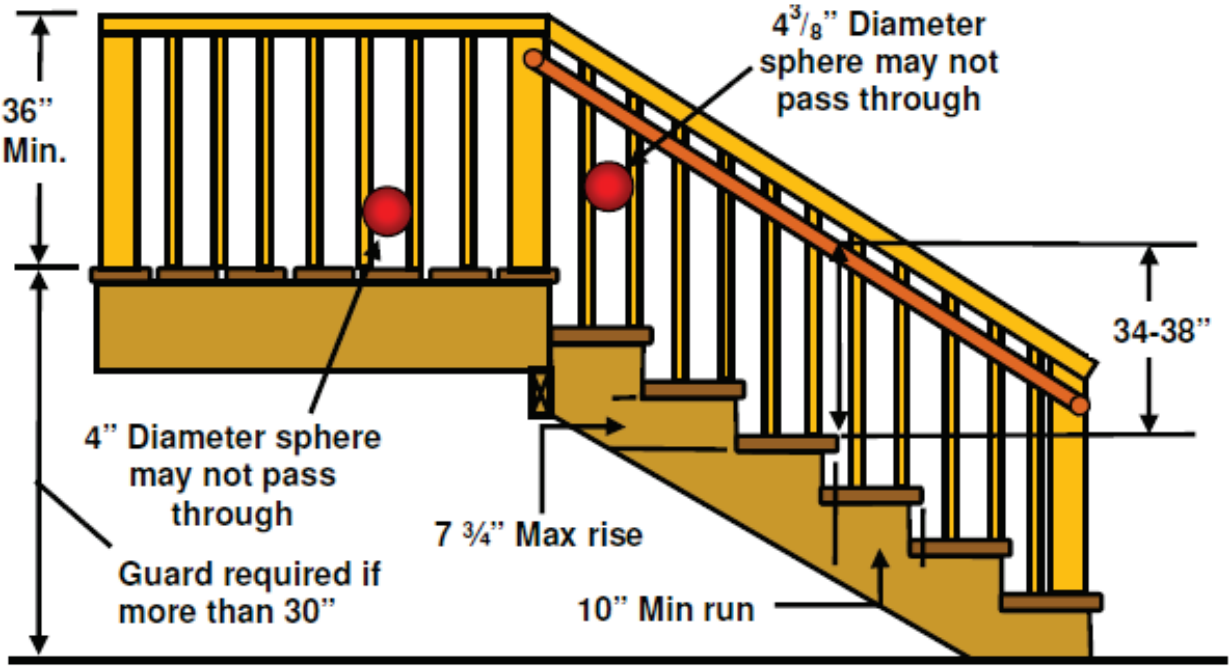
Guards and handrails must be provided as shown on the following illustrations. Guards must continue down stairs where the stair is more than 30 inches above grade. The height of guards on stairs must be 34 inches minimum.

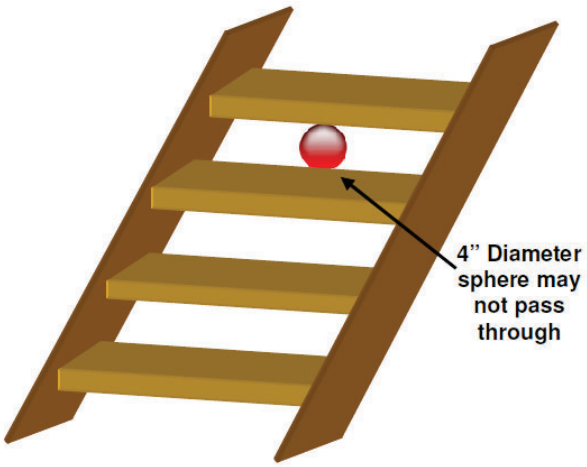
Handrails must be provided on at least one side when there are four or more risers. Handrails must have returns on each end or terminate in a newel post. Other handrail shapes having an equivalent gripping shape may be used with prior approval of the Building Department.

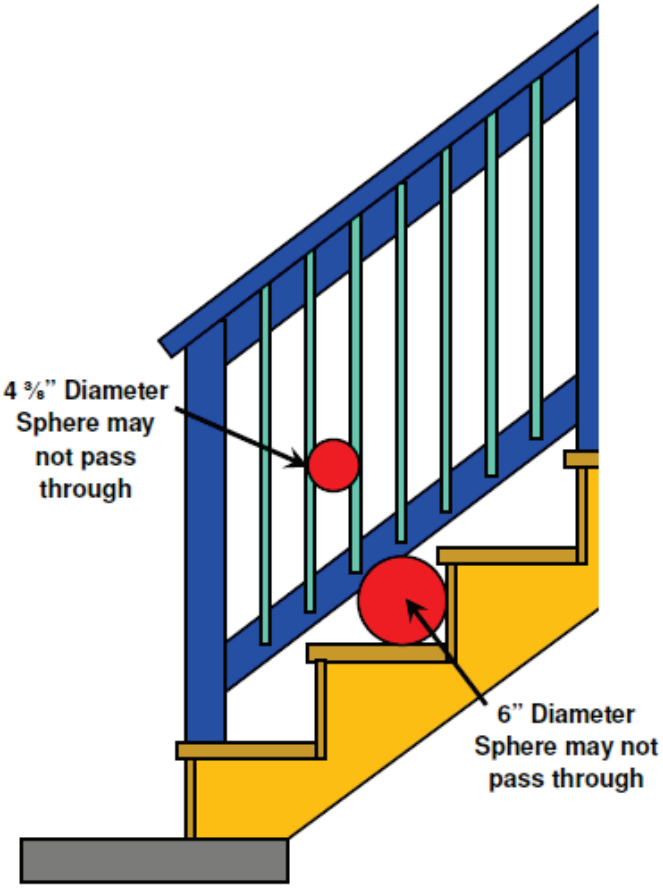
Handrails must be continuous for the entire length of the stairs and may not be interrupted by newel posts except at landings.

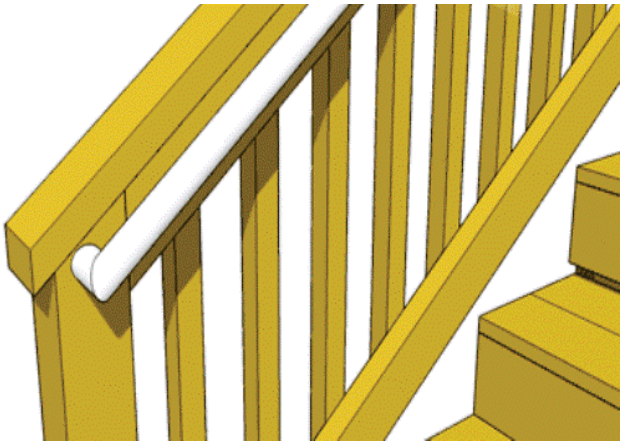
<u>Hand rails and guards must be designed to support a 200 lb load applied in any direction at any point along the top of the guard or rail.</u> The bottoms of the stringers should rest on a sound foundation such as a gravel bed, a concrete pad, pavers, or similar.



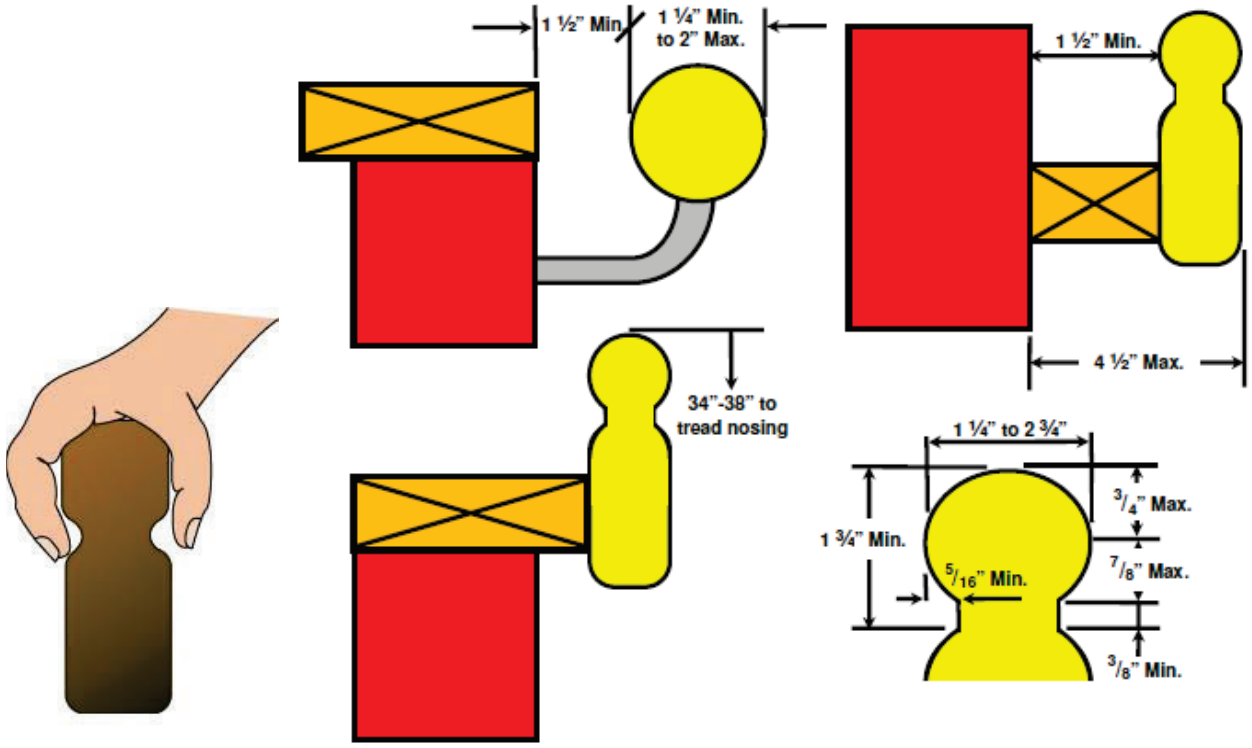


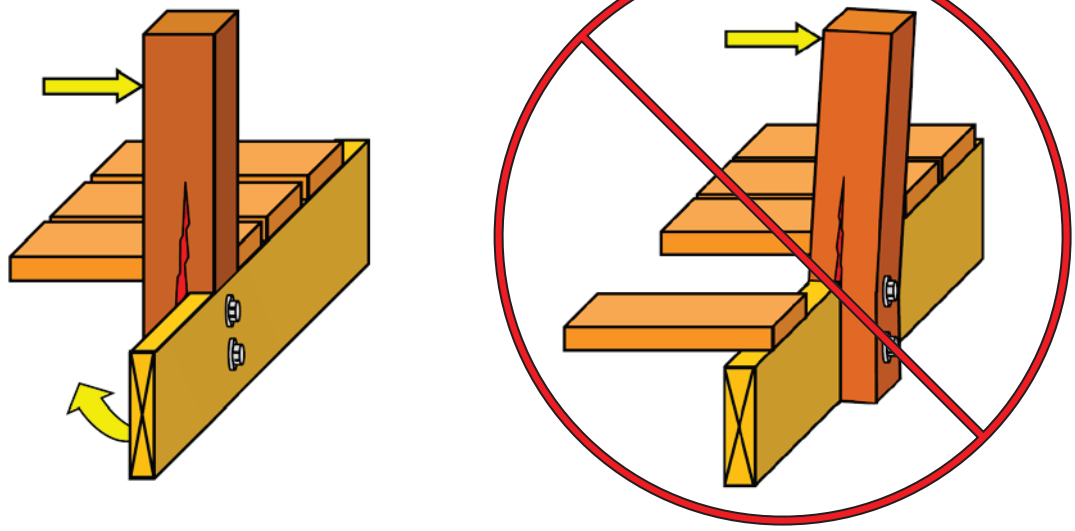




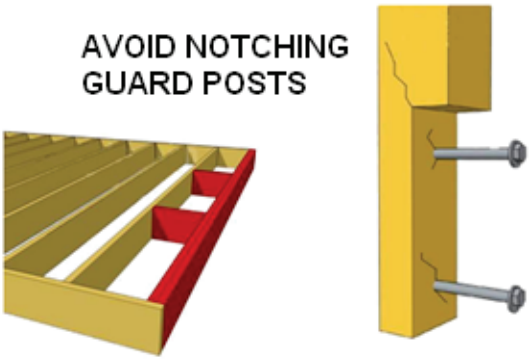


HANDRAILS MUST RETURN TO A NEWEL POST AND BE CONTINUOUS WITHOUT INTERUPTION FOR THE LENGTH OF THE FLIGHT

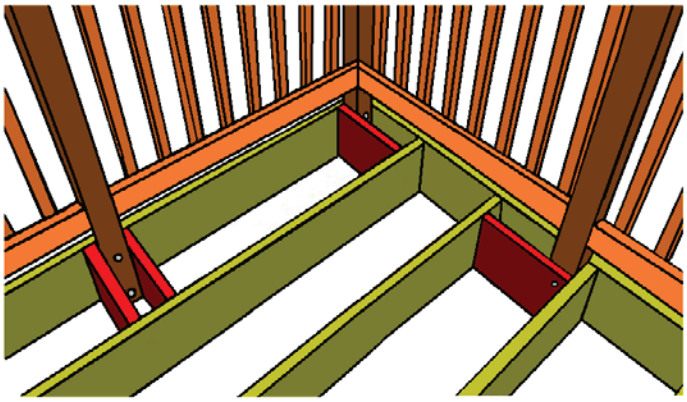

1 ½" Min.
1 ¼" Min. to 2" Max.
1 ½" Min.
4 ½" Max.
34"-38" to tread nosing
1 ¼" to 2 ¾"
3/4" Max.
1 ¾" Min.
7/8" Max.
5/16" Min.
3/8" Min.



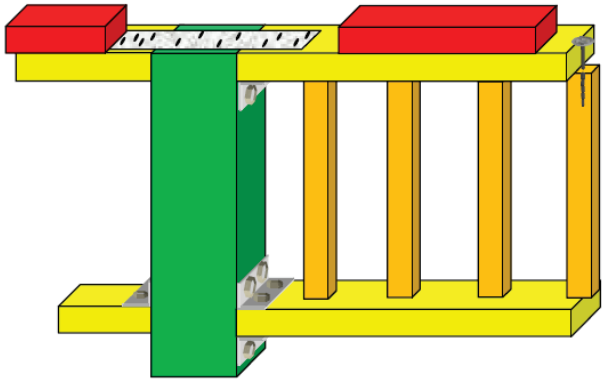
AVOID NOTCHING
GUARD POSTS



BLOCKING MAY BE ADDED TO STRENGTHEN POST ATTACHMENT



Examples of Devices that can be used to resist horizontal loads



COMPOSITES AND OTHER DECK/RAILING PRODUCTS

THIS HANDOUT DOES NOT COVER DECK OR RAILING PRODUCTS MADE OF COMPSITES, ALUMINUM, STEEL, GLASS, OR ANY OTHER MAN MADE PRODUCT. THOSE PRODUCTS 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.