



CITY OF SPRING LAKE PARK

Code Enforcement Division

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Spring Lake Park, Minnesota 55432

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DECKS

All governing codes and noted sections are based on the 2020 Minnesota Residential Code

WHEN IS A DECK PERMIT REQUIRED?

One and Two Family Residential Deck

A permit is required for all decks & deck repair (decking & guardrails) with the following exceptions:

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

Freestanding decks do not require a permit if they are not more than 30 inches above adjacent grade and does not have a door exiting onto the deck. Freestanding decks do not require footings that extend below the frost depth. It is still important to consider zoning ordinances and/or homeowners association requirements prior to constructing a free standing deck.

Home Owner's Association: Requirements are not enforced by the City of Spring Lake Park. It is the responsibility of the property owner to verify compliance with those requirements.

REQUIREMENTS FOR PERMIT APPLICATION SUBMITTAL

1. A completed and signed, Building Permit.
2. A copy of your property survey showing the property lines, existing buildings, and location of the proposed deck – include distances to property lines.
3. Two copies of deck plans. All structural members must be sized and properly spaced to support all loads. All of the following items must be included with the deck plans:

USE THIS HANDOUT TO CONFIRM PROPOSED SIZES, SPANS, AND SPACINGS ARE CODE COMPLIANT.

All dimensions drawn to scale

Size and depth of footings

Size and spacing of posts

Size of beams and headers

Stair location (if applicable)

Size of ledger and band joists

Lateral load connection details

Size, direction and spacing of joists

Elevation plan with height and guard design

Type, size, and direction of decking

Type and size of all materials used

Cantilevered floor system specs

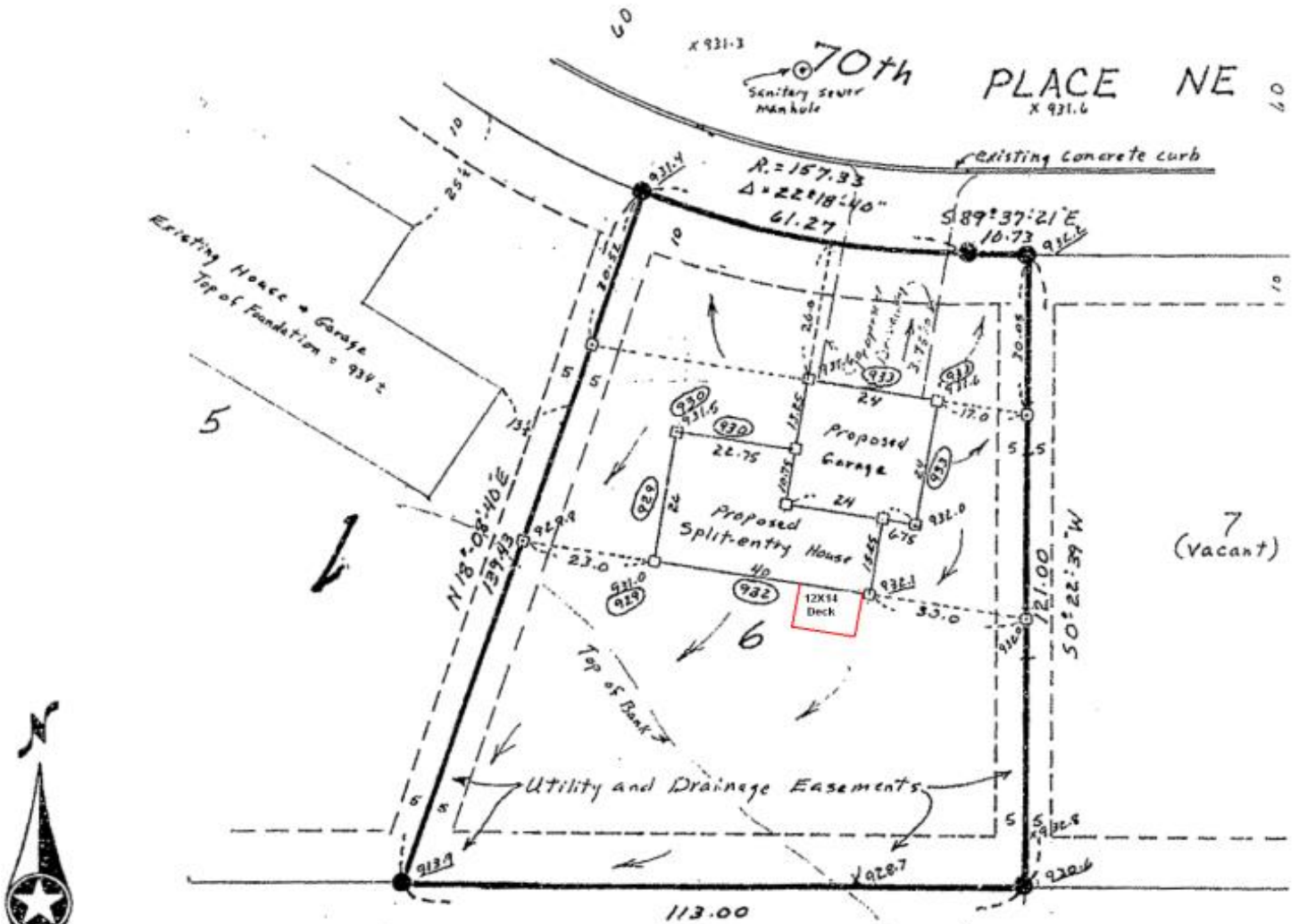
4. Structurally engineered plans are required when deck is supporting a hot tub / spa.

The deck plans must replicate the proposed deck, exactly. Plan review for code compliance is completed prior to permit issuance. NOTE: Plans created at home centers are seldom acceptable for plan review. They are often lacking information, and they often increase the time it takes to process the permit. The deck may be required to be freestanding – the details in this handout explain the freestanding deck requirements.

Use the following samples, examples and tables help with your design. Please do not submit any portion of this handout as your deck submittal documents.

SAMPLE CERTIFICATE OF SURVEY

THIS ILLUSTRATION IS AN EXAMPLE ONLY. IT IS INTENDED TO BE USED AS A REFERENCE FOR ITEMS TO BE INCLUDED ON DECK PLANS. IT IS NOT INTENDED TO SHOW COMPLIANCE WITH ANY CODES. CHANGES IN THE HEIGHT, SIZE, AND SHAPE OF A DECK WILL CAUSE VARIATIONS IN CODE REQUIREMENTS.



Benchmark: Top of first hydrant on East side of Fish Lake Road NW. of I. 494

- Bridge, Elevation = 936.97.
 SCALE: 1 INCH = $\frac{30}{1}$ FEET.
 ○ DENOTES 1/2 INCH IRON PIPE SET.
 ● DENOTES FOUND IRON MONUMENT.
 BEARINGS SHOWN ARE ASSUMED.
 □ DENOTES wood hub and Tac set.
 □ DENOTES wood hub set.

Proposed lowest floor elev. = 929.5
 Proposed Garage floor elev. = 933.0
 Proposed Top of foundation elev. = 933.5

- x 930 Denotes existing elevation.
- x 930 Denotes existing + proposed elev.
- 930 Denotes proposed elevation.

I HEREBY CERTIFY THAT THIS SURVEY, PLAN, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.

Jeff J. Cas
 DATE April 19, 1984 REG. NO. 251251

PERMIT PROCESS AND FEES

The Building permit fee is based on the project construction value and is designed to cover the cost of a plan review and all necessary field inspections that will be conducted during construction. Please allow 7-10 days for issuance of the permit. This process may be delayed if the plans are incomplete. You will be notified when your permit is ready to be picked up and paid for.

INSPECTIONS

Permit, approved plans, inspection record card, and all inspection notices shall be on site at all times.

Scheduling Inspections:

- Please plan inspections at least 2 business days in advance. Longer delays may occur during periods of busy construction. Have address & permit number ready when scheduling.
- **Footing / Ledger Inspection** - Holes dug, loose material/water removed, prior to placing concrete – bottom of footing must be sandy original soil (no black organic soil, or fill).
Unless the deck is built as free-standing, the inspector must have access to the inside of the home at the final inspection, to verify proper attachment of deck to home.
- **Underfloor Framing Inspection** – This inspection is required when the clear space under the deck joists is less than 48" above grade.
- **Final Inspection** – When all work complete and all stairs, handrails, and guards in place. Permit holder or designee shall meet on site for final inspection.
Access to inside of home required if the deck ledger attachment did not pass at time of original footing / ledger inspection.

ZONING REGULATIONS

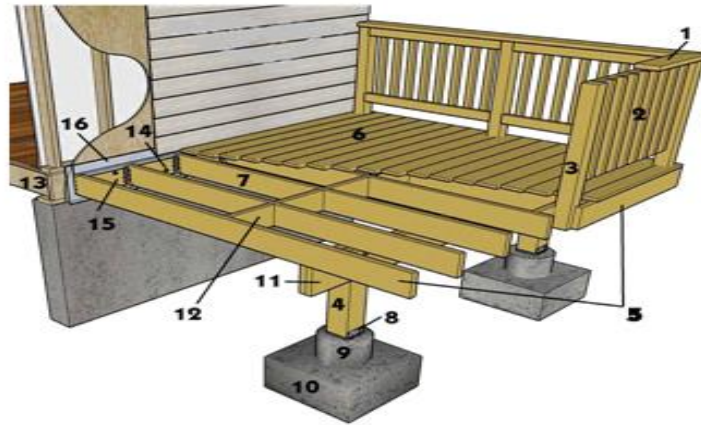
Decks are permitted as an addition to a dwelling or as a freestanding structure in a side or rear yard. Decks must be at least ten feet from a side lot line and 40 feet from a rear property line. Development resolutions, easements, wetland buffers, and other lot restrictions may require greater setbacks than permitted by the zoning ordinance. The most restrictive setback applies. Setbacks are routinely checked as a part of the plan review and again at the time of the footing inspection. If your deck is to be placed near the required setback, it may be necessary to locate and expose your property markers. The pictures to the right are examples of what your markers may look like - colors may vary.

DO NOT REMOVE THE MARKERS



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. 1/2" BOLTS
15. LEDGER BOARD
16. FLASHING

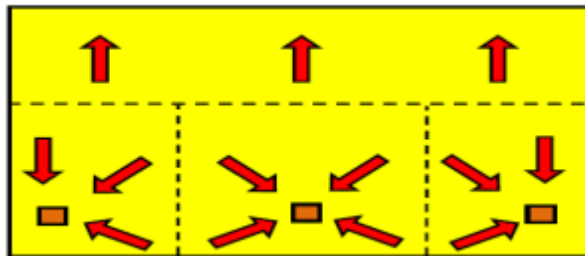


FOOTINGS

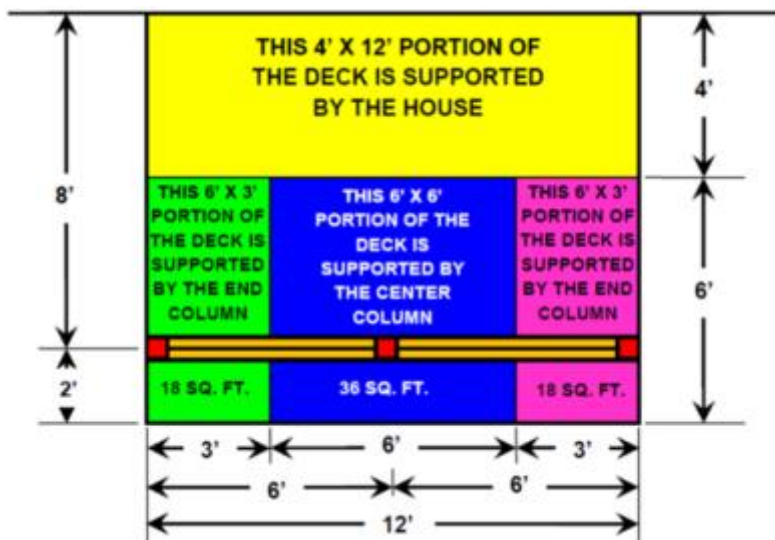
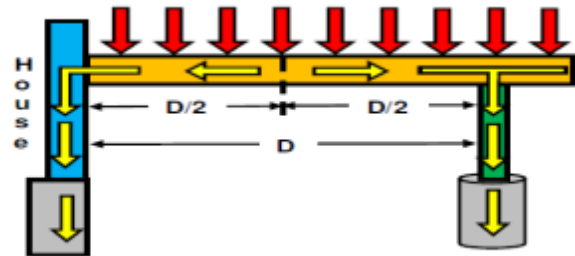
Use this section to calculate footing sizes

When preparing the plans and details for your deck you must calculate and provide the details about the footing sizes. The first step in calculating footing sizes is to determine load at each footing. Use the following illustrations to understand how to calculate the sizes.

UNDERSTANDING LOAD PATHS



Loads are assumed to be uniform across the floor



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

Minimum deck footings should be sized according to the following table. Footings must extend **at least 42 inches below grade** (frost line).

MINIMUM DECK FOOTING SIZES* – NOT FOR USE WITH HOT TUBS							
Max. Area of Deck Supported in Sq Ft	Footing Diameter Required in Inches	Max. Area of Deck Supported in Sq Ft	Footing Diameter Required in Inches	Max. Area of Deck Supported in Sq Ft	Footing Diameter Required in Inches	Max. Area of Deck Supported in Sq Ft	Footing Diameter Required in Inches
10	10	23	15	41	20	65	25
13	11	27	16	47	21	72	26
16	13	32	18	53	23	79	27
19	14	36	19	59	24	86	29

**footing sizes refer to the bottom diameter of a typical bell shaped footing – 12" thickness.*

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; see "Understanding Load Paths" above.**

2020 MN Residential Code Section R403.1 – Footings shall be supported on undisturbed natural soil or engineered fill.

- Some homes in Spring Lake Park are constructed on corrected soil pads. This is because soil conditions prior to development were too low and often unsuitable. These corrected building pads are not much larger than the home structure itself.
- Soils outside of these corrected pads may not be suitable for the construction of decks, porches, or home/garage additions. Any proposed construction of a deck, porch, or an addition may require soils corrections, or an engineer's soils report may be required to verify minimum bearing capacity of 1,500 PSF.

HOW TO DESIGN FOOTING FOR A DECK

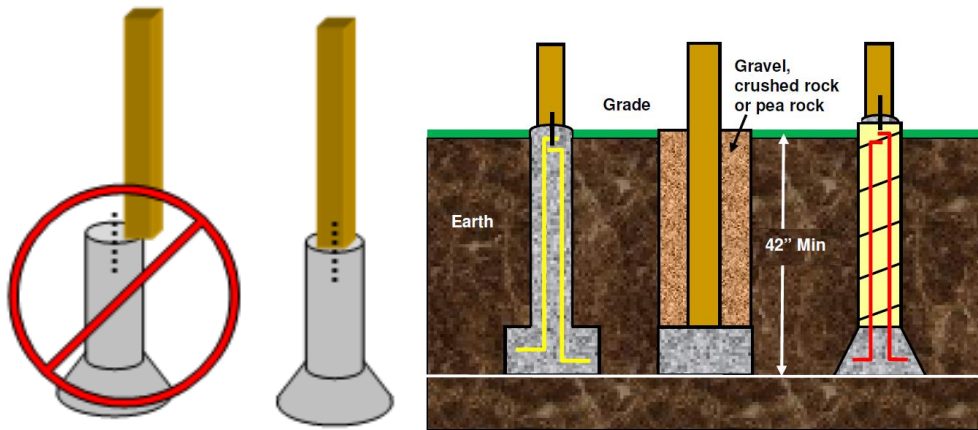
1. **Concrete Footings** – The permit holder is responsible for the design size, but they cannot be a smaller diameter than listed in the Minimum Deck Footing Size Table above. In lieu of using this table, another option is to provide an engineer's soils report to verify minimum bearing capacity, and design them accordingly.

Footings must still be set on sandy/suitable soils (no black organic type soils) or the footing inspection will fail. The footing inspection will fail if suitable soils cannot be verified, and soils corrections and/or deck footings must be designed by a licensed professional engineer.

2. **Non-concrete manufactured pin style footings** – Are not permitted in Spring Lake Park.
3. **Helical piles (screw-pile)** are permitted in accordance with manufacturer's instructions. These are long screw-like piles that can reach suitable soils without the need for soils corrections. Screw-piles must be installed by a certified contractor.

POST

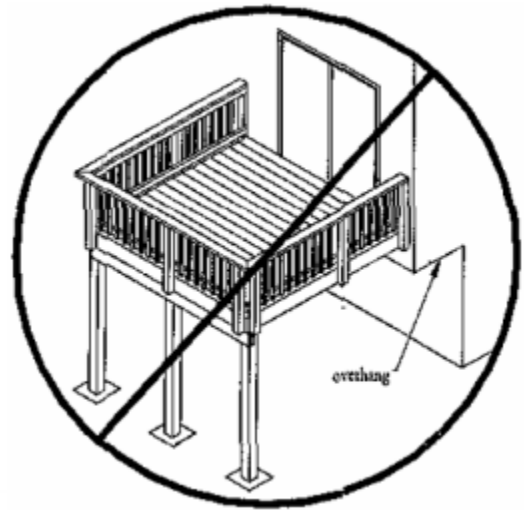
THE REQUIRED AREA OF THE COLUMN SHALL FULLY BEAR ON THE FOOTING



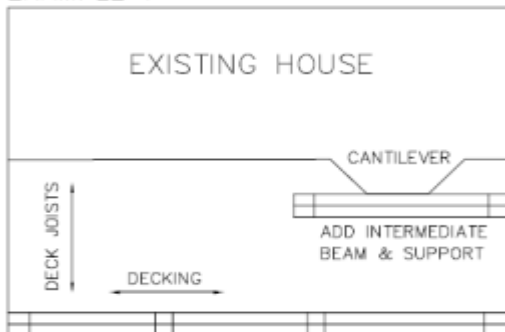
Cantilevered Floor of Existing Dwelling

Unless the cantilevered floor system is specifically designed to support the load of the deck, the deck cannot be attached to the cantilevered floor. If you are unable to provide approval and design specifications from floor system manufacturer or a structural engineer, the deck shall be self-supporting (see this handout for self-supporting deck details)

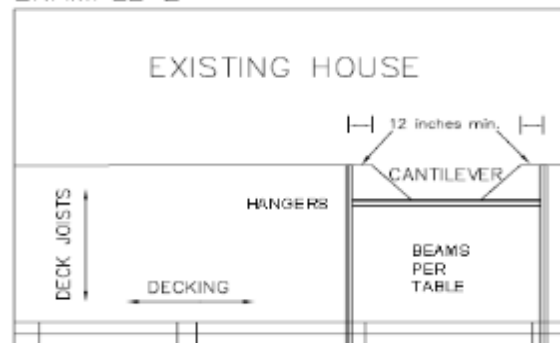
Many house designs have cantilevered (extensions) from the main structure and which typically contain patio doors for future deck additions. The reinforcement selected will be based on the type of floor framing member presently in the house. The illustrations below show two possible solutions for providing such reinforcement.



EXAMPLE 1



EXAMPLE 2



Example 1. Add an intermediate beam, supports and footings. Size the beam and footings to support load.

Example 2 Size beams per table (included in this handout). Provide adequate hangers from all connections.

DECK LEDGER – VERTICAL AND LATERAL LOAD REQUIREMENTS

Important notice: If positive connection cannot be met and verified by inspection – the deck shall be self-supporting (see this handout for self-supporting deck details).

R507.1 Decks.

Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. For decks with cantilevered framing members, connections to exterior walls or other framing members, shall be designed and constructed to resist uplift resulting from the full live load specified in Table R301.5 acting on the cantilevered portion of the deck.

R507.9 Deck ledger connection to band joist.

For decks supporting a total design load of 50 pounds per square foot (2394 Pa) [40 pounds per square foot (1915 Pa) live load plus 10 pounds per square foot (479 Pa) dead load], the connection between a deck ledger of pressure- preservative-treated Southern Pine, incised pressure-preservative-treated Hem-Fir or approved decay-resistant species, and a 2-inch (51 mm) nominal lumber band joist bearing on a sill plate or wall plate shall be constructed with ½ -inch (12.7 mm) lag screws or bolts with washers in accordance with Table R507.9.1.3. Lag screws, bolts and washers shall be hot-dipped galvanized or stainless steel.

TABLE R507.9.1.3(1) 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, and 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 and e}						
½ inch diameter lag screw with 1 ⁵ / ₃₂ inch maximum sheathing ^a	30	23	18	15	13	11	10
½ inch diameter bolt with 1 ⁵ / ₃₂ inch maximum sheathing	36	36	34	29	24	21	19
½ inch diameter bolt with 1 ⁵ / ₃₂ inch maximum sheathing and ½ inch stacked washers ^{b, h}	36	36	29	24	21	18	16

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.

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	¼ inch	2 inches ^b	1 ⅝ inches ^b
Band Joist ^c	¾ inches	2 inches	2 inches ^b	1 ⅝ inches ^b

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).

R507.9.1 Placement of lag screws or bolts in deck ledgers and band joists. The lag screws or bolts in deck ledgers and band joists shall be placed in accordance with Table R507.9.1.3(1) and Figures R507.9.1.3(2) and R507.9.1(1) below.

FIGURE R507.9.1.3(1)

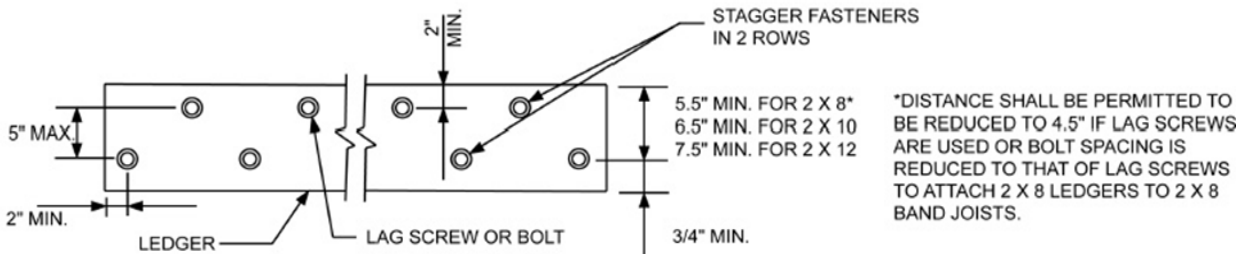
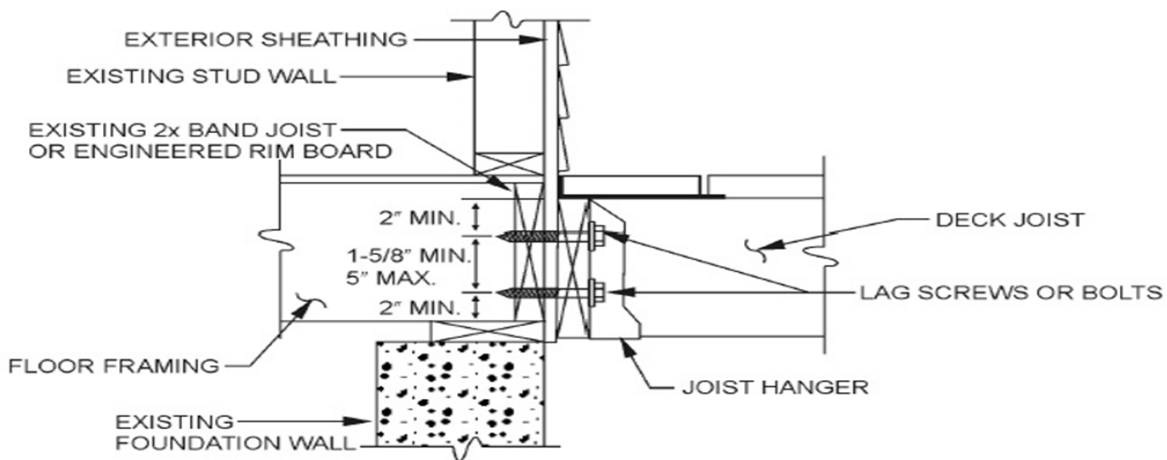


FIGURE R507.9.1.3(2)

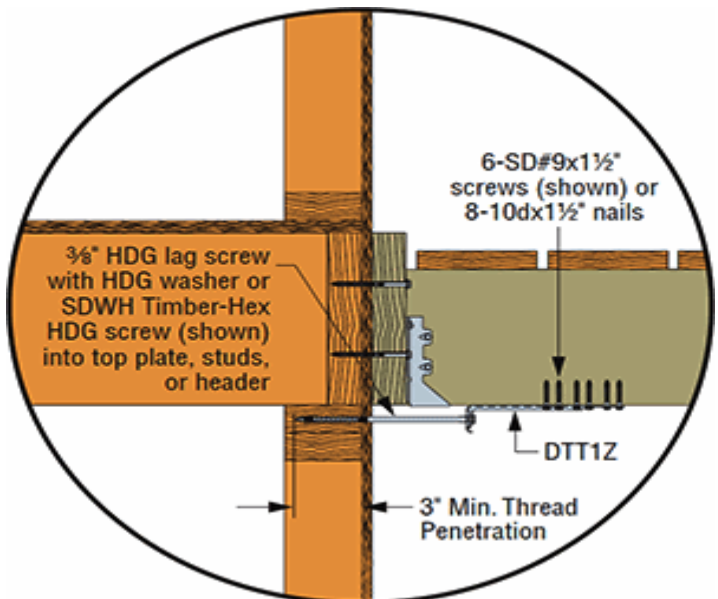


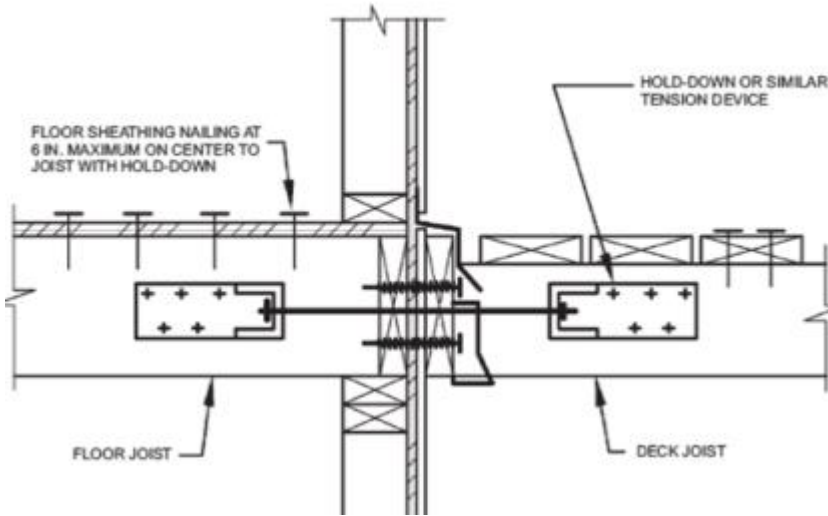
ALTERNATE METHODS FOR LATERAL SUPPORT

MECHANICAL CONNECTIONS

If the deck is freestanding or you are choosing an alternate method for lateral support, the details must be provided with your application for review. This handout contains information and examples of a few alternate design methods, but other methods may be approved. Whichever method is used, installation shall be per manufacturers and MN residential building code requirements.

Simpsons DTT1Z or similar as shown to right would require a minimum of 4 connections.



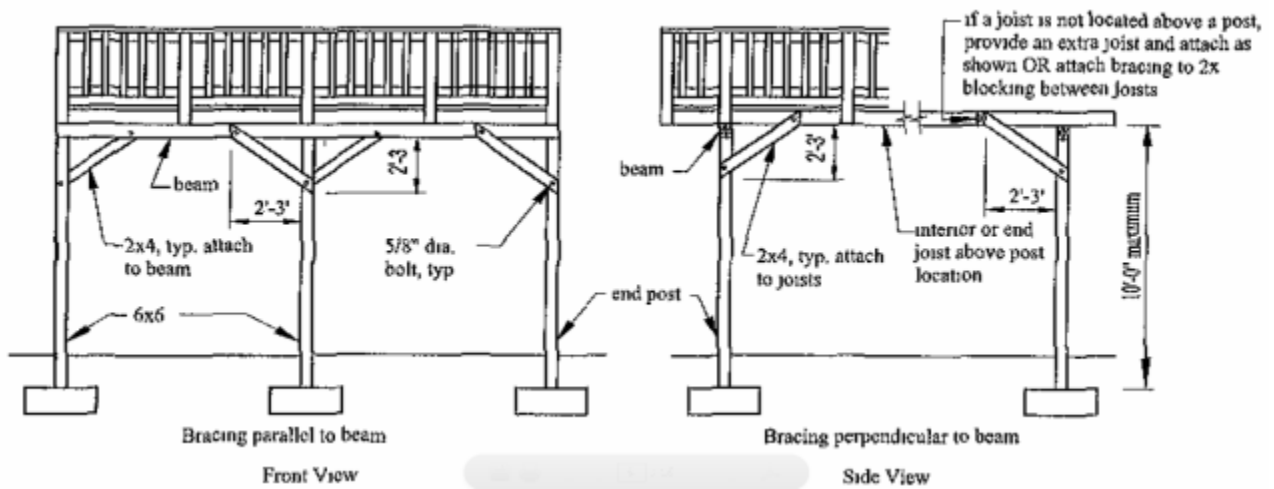


If this method is used, per code section R507.9.2(1) there shall be a minimum of 2 devices installed, and each device shall have an allowable stress design capacity of not less than 1500 pounds.

The hold-down tension device manufacturer prescribes alternate methods for attaching to engineered or manufactured wood floor systems and for achieving floor sheathing attachment where floor covering

already in place.

DIAGONAL BRACING



The illustration above is one example of diagonal bracing that may be used as an alternate method of lateral bracing for all decks. Freestanding decks, regardless of height above ground, shall resist vertical loading, lateral loading and movement. One set of diagonal bracing shall be located between posts and beams or parallel to the house. Another set of diagonal bracing shall be located perpendicular to beams and house in the end spans. This bracing shall be bolted to the post and joist above the post location. If the joist spacing is such that a joist does not align over a post location an extra joist shall be added to facilitate connection of the diagonal bracing. A minimum of one 5/8" bolt shall be used at each connection between bracings posts, beams, and joists when 6x6 inches posts are used. The photo above shows the use of 2x4 bracing. The photo at right shows 6x6 bracing

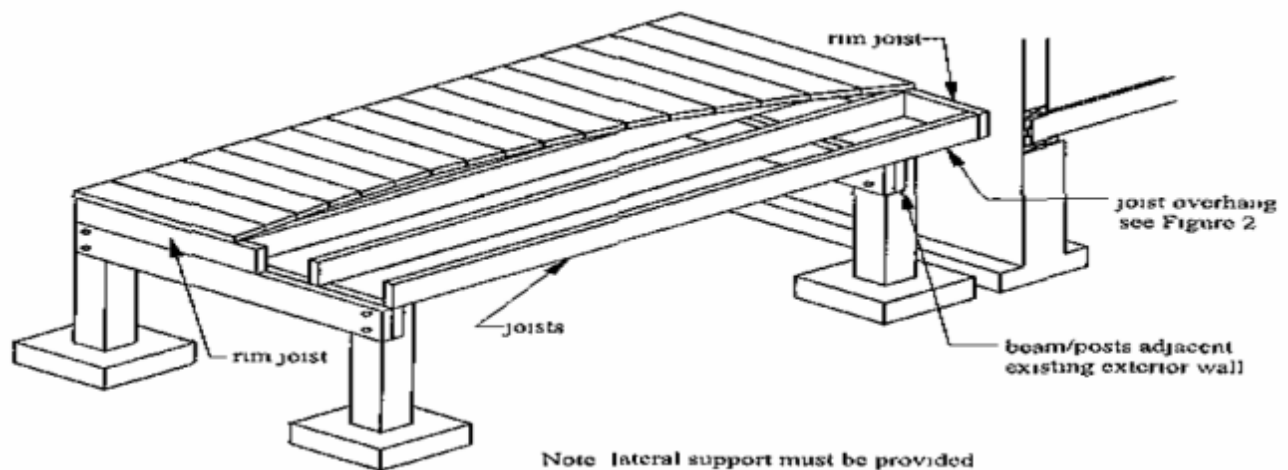


EMBEDDING POSTS

Embedding the uncut treated posts in concrete can be used to provide lateral support. Important note: Due to expansion and contraction of the wood posts there is a potential for accelerated decay, therefore it is a less common method. If this method is chosen, provide specific design details with your deck plans and application (posts to be rated for ground contact use).

Placing the uncut treated post on a concrete footing pad a minimum of 42" below grade and embedding posts by packing dirt or rock back around the posts would require a specific design by a structural or soils engineer, or other alternate methods for lateral load protection.

FREESTANDING/SELF-SUPPORTING DECKS



Sometimes the house has limitations that make attaching a deck to it impossible or undesirable. The deck shall be freestanding/self-supporting when positive connections for vertical and lateral loads cannot be accomplished and inspected.

Freestanding/self-supporting decks shall also be designed for both vertical and lateral loads.

Freestanding decks less than 30" above grade, not attached to the house, and not serving a required exit does not require full frost footings or a building permit. Decks 30" or more above grade; shall have footings that extend below grade and bear on natural, undisturbed soils – but in no case less than 42". Footing located any closer than 5 feet from the foundation must be at the same level as the house footing.

Freestanding/self-supporting decks shall also be designed for both vertical and lateral loads.

Note: The over-excavation at the time the footings are installed for the dwelling disturbs the natural soils. This means, for self-supporting decks, the first row of footings (closest to the house) shall have a minimum depth equal to the depth of the footings of the existing dwelling.

JOIST DETAILS

Joists shall be the same size or smaller than the ledger. 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. Joist spacing is determined by the type of decking used. The floor decking shall determine the spans for joists and stair stringers.

Note: Maximum spans for decking on stairs is often less than the span permitted on the deck.

MAXIMUM WOOD DECK BOARD SPANS (NOT ON STAIRS)	
DECKING MATERIAL	JOIST SPACING
2x6 OR 5/4 SOUTHERN PINE PERPENDICULAR TO JOIST	24" O.C.
5/4 CEDAR OR REDWOOD AND 2X4 PERPENDICULAR TO JOIST OR 5/4 SOUTHERN PINE OR 2X6 AT 45 DEGREES TO JOIST	16" O.C.
5/4 AND 2X4 CEDAR OR REDWOOD AT 45 DEGREE TO JOIST	12" O.C.
MANUFACTURED OR COMPOSITE DECKING	PER MANUFACTURER'S REQUIREMENTS

JOIST SPAN

JOIST SPACING ¹ (Source AF&PA; as amended 6/01/2013)						
JOIST SIZE	SOUTHERN PINE			WESTERN CEDAR/PONDEROSA PINE		
	12" oc	16"oc	24"oc	12" oc	16"oc	24"oc
2X6	9'11"	9'0"	7'7"	8'10"	8'0"	6'10"
2X8	13'1"	11'10"	9'8"	11'8"	10'7"	8'8"
2X10	16'2"	14'0"	11'5"	14'11"	13'0"	10'7"
2X12	18'0"	16'6"	13'6"	17'5"	15'1"	12'4"

Assumes 40 psf live load, 10 psf dead load, L/360 deflection, No. 2 grade lumber, and wet service conditions

BEAMS

BEAM SPANS DIMENSIONAL LUMBER FOR JOISTS FRAMING FROM ONE SIDE ONLY (Center of one column to center of next) (Source American Wood Council 2015)								
Species	Beam Size**	Joist Spans						
		6'	8'	10'	12'	14'	16'	18'
Southern Pine	2-2X6	6'8"	5'8"	5'1"	4'7"	4'3"	4'0"	3'9"
	2-2X8	8'6"	7'14"	6'6"	5'11"	5'6"	5'1"	4'9"
	2-2X10	10'1"	8'9"	7'9"	7'1"	6'6"	6'1"	5'9"
	2-2X12	11'11"	10'4"	9'2"	8'4"	7'9"	7'3"	6'9"
	3-2X6	7'11"	7'2"	6'5"	5'10"	5'5"	5'0"	4'9"
	3-2X8	10'7"	9'3"	8'3"	7'6"	6'11"	6'5"	6'1"
	3-2X10	12'9"	11'0"	9'9"	8'9"	8'3"	7'8"	7'3"
	3-2X12	15'0"	13'0"	11'7"	10'6"	9'9"	9'1"	8'7"

Cedar, Redwood, Ponderosa Pine	2-2X6	5'2"	4'5"	3'11"	3'7"	3'3"	2'10"	2'6"
	2-2X8	6'7"	5'8"	5'1"	4'7"	4'3"	3'10"	3'5"
	2-2X10	8'1"	7'0"	6'3"	5'8"	5'3"	4'10"	4'5"
	2-2X12	9'5"	8'2"	7'3"	6'7"	6'1"	5'8"	5'4"
	3-2X6	7'1"	6'5"	5'9"	5'3"	4'10"	4'6"	4'3"
	3-2X8	9'5"	8'3"	7'4"	6'8"	6'2"	5'9"	5'5"
	3-2X10	11'9"	10'2"	9'1"	8'3"	7'7"	7'4"	6'8"
	3-2X12	13'8"	11'10"	10'6"	9'7"	8'10"	8'3"	7'10"

**Beam depth must be equal to or greater than joist depth if joist hangers are used on beam.

POSTS

		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	17	16	16	15	14	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						

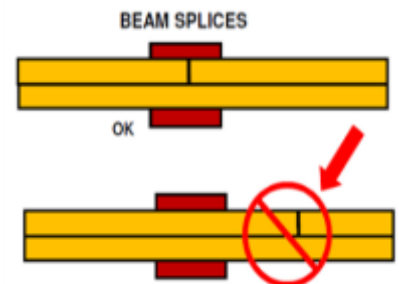
Posts shall be rated for ground contact.

2020 MINNESOTA STATE RESIDENTIAL BUILDING CODE REQUIREMENTS

The bottom of the footing must bear on undisturbed soils – a minimum of 42" below grade or greater; measured either vertically and horizontally. Augured footings shall have smooth forms installed prior to the footing inspection. Deck ledger board must be greater than or equal to the deck joists and not greater than the depth of the existing rim/band joist it will be fastened to. The ledger must be secured and attached to the structure per table R507.2 and R507.2.1 within this handout.

Beam splices must be directly over posts, minimum of 1½" bearing.

Joist hangers are required wherever joists do not have at least 1½" of bearing. (Exceptions: cantilevered ends.)



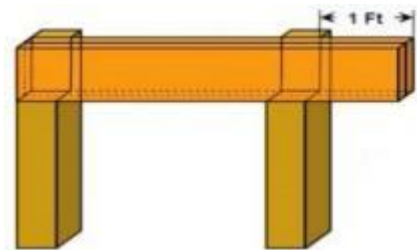
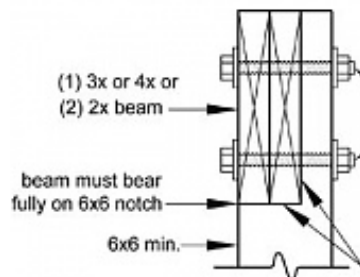
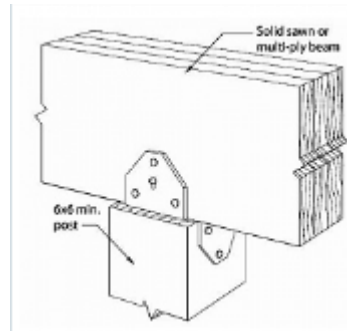
Hot-dipped galvanized or stainless-steel connectors are required for footing to post, post to beam, and beam to joist connections, and joist to ledger.

Structural members of exterior decks must be cedar, redwood, treated wood or an approved composite material.

Hangers, connectors and fasteners used in conjunction with ACQ treated lumber are required to be ACQ compatible.

Special designs or engineering may be required for a 3-season porch or if spas/whirlpool tubs will be placed/located on decks.

Floor joist spacing shall be determined by the type and orientation of decking. For all manufactured/composite deck materials, provide evaluation/testing report from the International Code Council or other approved agency.



Beams may only be

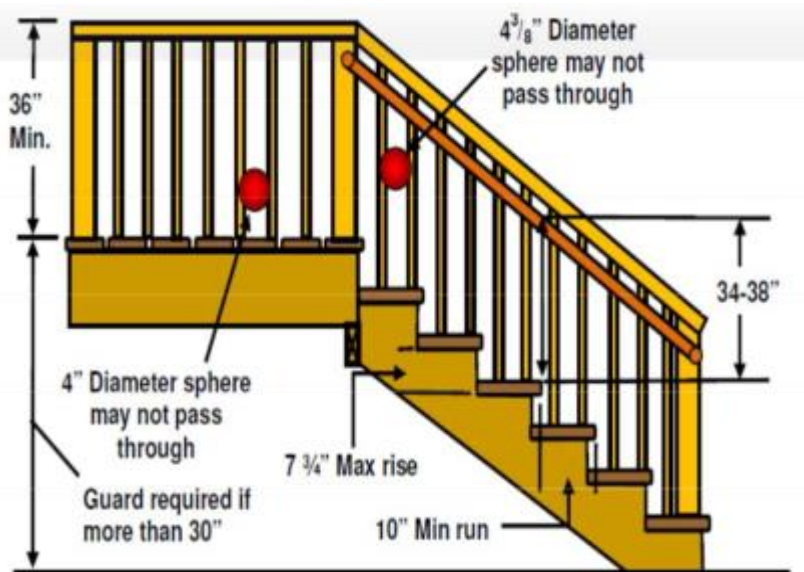
cantilevered a maximum of 1 foot.

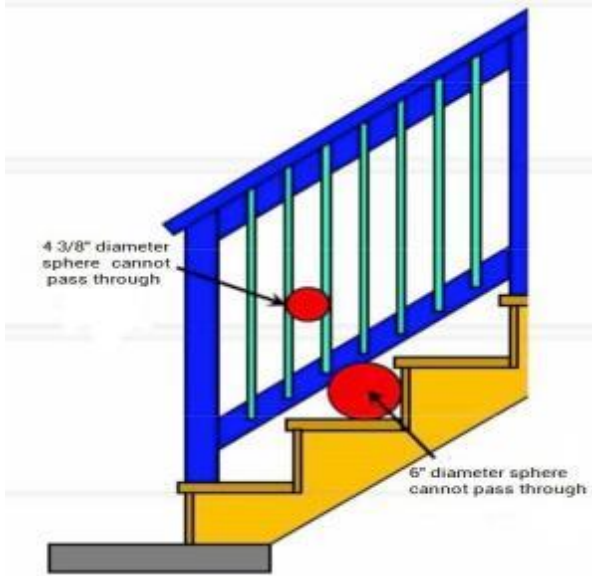
Electrical service lines over or within 3' horizontally of the deck or stairs must have a minimum 10' vertical clearance.

Stairways must be 36" between guards for the full length of the stairway.

Guards are required on all decks more than 30" above grade. Guards must be 36" minimum in height. Open guards must have intermediate rails or an ornamental pattern that a 4" sphere cannot pass through. Guards must be able to withstand 200 lbs. of applied pressure.

The maximum rise is 7 3/4", the minimum run is 10". Treads, risers and nosings shall be consistent within 3/8". Open risers on stairs with a total rise greater than 30" is not permitted to allow the passage of a 4" diameter sphere. A nosing not less than 3/4 inch or greater than 1 1/4" shall be provided on stairways. Spiral stairs are to comply with Section R311.7.9.1.





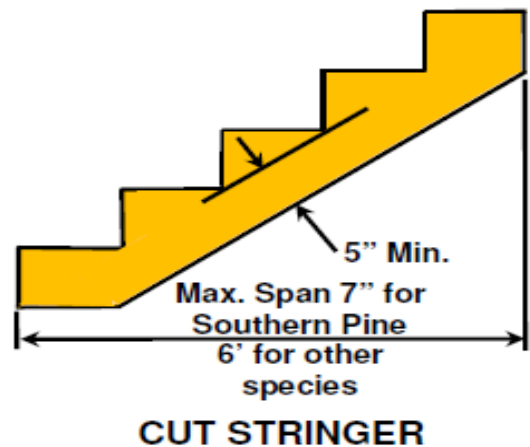
Stairways require a guard not less than 34" in height from the nose of the treads. Open guards shall have intermediate rails or an ornamental pattern such that a sphere 4 3/8" in diameter cannot pass through. The triangular openings formed by the riser, tread and bottom rail of guards shall be such that a sphere 6" in diameter cannot pass through.

If span of stair stringers will exceed 7 feet additional support shall be provided. Include details in plan submittal.

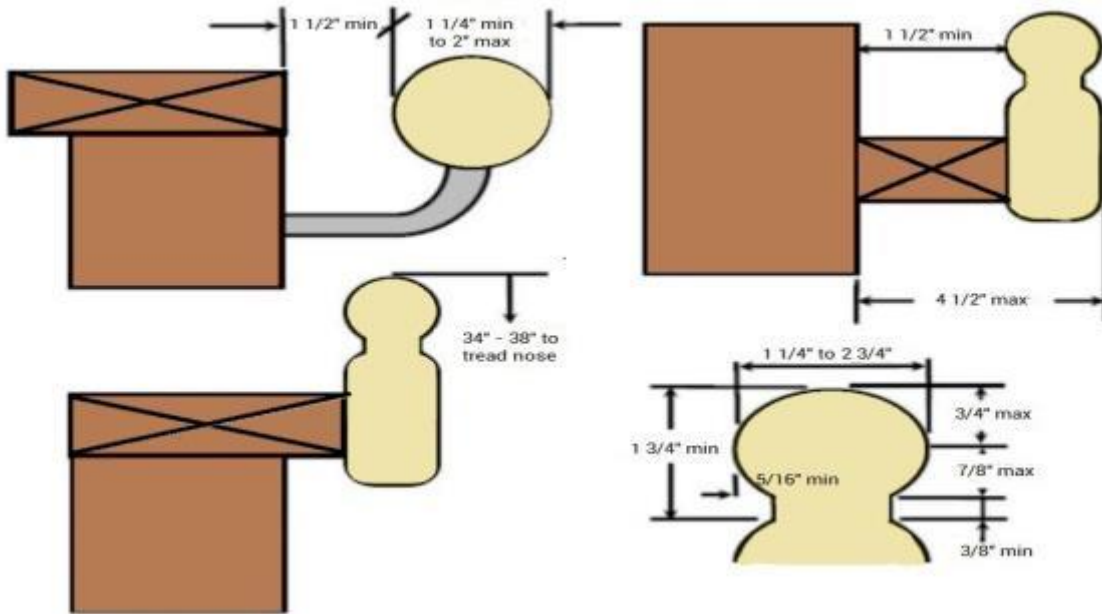
If total height of the deck is 12 feet or greater an intermediate landing shall be installed.

Landings shall be the width of the stairs and not less than 36 inches in the direction of travel.

If there are windows located less than 36" above the walking surface of the stairs or landings see the safety glazing handout for requirements.



CUT STRINGER



Handrails are required on stairs with four or more risers.

Handrails shall have a space of not less than 1½" between the handrail and the wall or guard. The handrails shall be not less than 1¼" or more than 2" in diameter

Handrails must have a continuous graspable surface and be 34" to 38" above the tread nosing and run the full length of the stairs with ends returned.

