

## DECK GUIDELINES

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*All information in this handout pertains to 1 and 2 family residential decks. The Town of Tolland is offering this informational handout as representative of typical issues/questions that may arise on a typical job. The Town assumes no responsibility for any errors, omissions and installer is required to follow applicable codes. No handout could possibly cover all situations, nor is it intended to.*

### IMPORTANT NOTES:

1. If you plan to install a hot tub, spa, pool, screen room, sunroom or future addition on proposed deck, or attach to an existing cantilever, this handout does not apply.
2. If proposed deck is in area of electric or gas service, oil fill and vent or other utilities additional requirements apply and are outside the scope of this handout. Contact the Building Department for additional information as needed.
3. If any direct vent exhaust is located in area of proposed deck, then additional requirements apply. Refer to manufacturers installation instructions of equipment for required clearances.

### PERMIT APPLICATION:

Please submit the following information:

1. Plot plan (building department can supply) with proposed deck drawn to scale. Zoning approval will be required. Health Approval may be required.
2. Floor plan drawn to scale.
  - a) Show deck size.
  - b) Size and spacing of floor joists.
  - c) Size and type of decking material.
  - d) Size, type, location and spacing of posts.
  - e) Size and type of beams.
3. Elevation plan drawn to scale.
  - a) Show height of structure from grade.
  - b) Size and depth of footings.
  - c) Guard and handrail height and spacing (if any).
  - d) Stairwell rise/run and guard and handrail height (if any).
  - e) Show any utilities (i.e.: overhead wires).
  - f) Note attachment detail for ledger and also, include type of flashing to be used on ledger.
4. Permit Fee.  
\$0-\$1,000 = \$20    Over \$1,000 or Fraction Thereof = \$12
5. Other fees. Zoning and Health district fees may apply. Check in Town Hall

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### STRUCTURAL NOTES:

Proper ledger attachment is crucial to structural safety of deck. If structure you are attaching deck onto has any of the following conditions then deck should be independently supported:

1. Cantilevered.
2. Brick or other soft masonry.
3. Supported on piers/posts.

If structure is typical wood frame on continuous foundation without any cantilever then ledger attachment spacing noted below can be used.

On-Center spacing of lag screws (inches)					
Lag Size	Joist span (feet)				
	0-5 ft.	6-7 ft.	7-10 ft.	11-14 ft.	15-18 ft.
½" Dia. Lag	32" o.c.	24" o.c.	16" o.c.	12" o.c.	8" o.c.
Equivalent spacing joists at 16" o.c.	Every other joist space	Each joist space	Each joist space	Each joist space with two every other space	Two in each joist space

- Wood must be pressure treated or naturally decay resistant.
- Fasteners must be compatible with wood used. See attached handout on fastener requirements.
- Piers are required to be 42" deep for frost protection. Piers should be minimum 10" round and depending on size of deck possibly larger.
- Posts must be of sufficient size to support loads, (6"X6" recommended) and positively attached to piers.
- Beams must be positively attached to posts with gussets or hardware designed for this purpose.
- All splices in beams must be supported by posts. No mid-span splices. Beams required to have minimum 1 ½" bearing on wood and 3" on concrete.
- Joists shall be supported by properly sized hanger, or minimum 2"x2" ledger strip.
- If deck is greater than 5' high, depending on size and structural details, diagonal bracing may be required at posts.

### EGRESS INFORMATION

If adding a door to the new deck:

(Amd) **R311.4.2 Door type and size.** The required door shall be a side-hinged door not less than 3 feet in width and 6 feet 8 inches in height. Other doors shall be permitted to be

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side hinged, swinging, sliding, bi-fold or revolving doors, shall not be required to comply with the minimum door width and shall be permitted to be not less than 6 feet 6 inches in height.

(Amd) **311.4.3 Landings at exterior doors.** There shall be a floor or landing a minimum of 3 feet in the direction of travel and 3 feet in width, or a width equal to the width of any adjacent stair, whichever is greater, on each side of each exterior door. The landing on the exterior side of doors shall not be more than 8 ¼ inches below the top of the threshold provided that the door, other than an exterior storm or screen door, does not swing over the landing. In the event that the door, other than an exterior storm or screen door, swings over the landing, the landing shall not be more than 1.5 inches below the top of the threshold.

**Exception:** At other than the required exit door, a landing is not required for the exterior side of the door where a stairway of three or fewer risers, including the top riser from the dwelling to the top tread, is located on the exterior side of a door.

### DECK JOIST TABLE

Southern Pine 2x6 16" on center 9' 5"  
Southern Pine 2x8 16" on center 12' 5"  
Southern Pine 2x10 16" on center 15' 10"  
Southern Pine 2x12 16" on center 18' 10"

The above spans are from Southern Pine Joist and Rafter span chart for a 40-pound per square foot (psf) live load and a 10 psf dead load with a 360 deflection and a moisture content above 19% due to exposed exterior location. Additional span information is available in Building Department during inspector hours of 8:00-9:00 a.m. or 1:00-2:00 p.m., Monday through Thursday.

Or go to the website for Southern Pine Council at [www.southerpine.com](http://www.southerpine.com).

Also check with The American Wood Council at [www.awc.org](http://www.awc.org) for good information on deck structure and design. They have a prescriptive deck guide that is very thorough with good diagrams and information.

As always it is very important to gather as much information as possible before beginning any project!

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## Deck Beam – Span Chart

Maximum Beam Span – Residential Decks (40 spf live load-/10psf dead load)								
Southern Pine CCA #2	Tributary Load Width (Tributary width is the portion of the joist span supported by the beam)							
	Tributary Width	Tributary Width	Tributary Width	Tributary Width	Tributary Width	Tributary Width	Tributary Width	Tributary Width
Beam Size	4'	5'	6'	7'	8'	9'	10'	11'
2x8	6'5"	5'2"	4'3"	3'8"	3'2"	2'10"	2'7"	2'4"
2-2x8	10'1"	9'1"	8'3"	7'4"	6'5"	5'8"	5'2"	4'8"
3-2x8	12'10"	11'10"	10'10"	10'	9'5"	8'6"	7'8"	7'
2x10	8'2"	6'6"	5'5"	4'8"	4'1"	3'8"	3'3"	3'
2-2x10	12'0"	10'9"	9'10"	9'2"	8'2"	7'3"	6'6"	5'11"
3-2x10	15'8"	14'1"	12'10"	11'11"	11'12"	10'7"	9'9"	8'11"
2x12	9'11"	7'11"	6'7"	5'8"	5'	4'5"	4'	3'7"
2-2x12	14'0"	12'7"	11'6"	10'8"	9'11"	8'10"	7'11"	7'3"

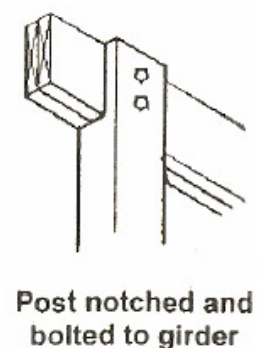
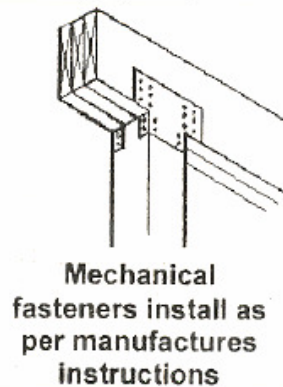
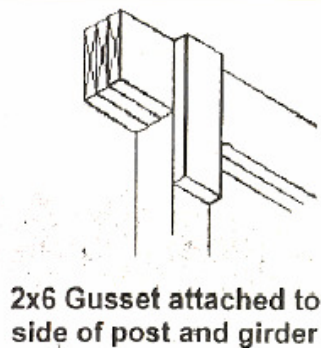
1. For simple spans the tributary width is ½ the joist length – for a center beam the tributary width is the sum of the ½ the span from each side of the beam.

Posts to girder attachment should be braced to prevent girder from “rolling” (Figure 3).

Any seams or splices in the girder **must** be over the posts. No **mid-span breaks!**

### Post to girder Attachment Detail (Figure 3)

#### Post to girder Attachment Detail (Figure 3)



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### STAIRWAYS

**WIDTH:** Stairways shall not be less than 36 inches in clear width at all points above the permitted handrail height and below the required headroom height.

Handrails shall not project more than 4.5 inches on either side of the stairway and the minimum clear width of the stairway at and below the handrail height, including treads and landings, shall not be less than 31.5 inches where a handrail is installed on one side and 27" where handrails are provided on both sides.

**HEADROOM:** The minimum headroom in all parts of the stairway shall not be less than 6 feet 8 inches measured vertically from the sloped plan adjoining the tread nosing or from the floor surface of the landing or platform.

**RISER HEIGHT:** The maximum riser height shall be 8 ¼" inches. The riser shall be measured vertically between leading edges of adjacent treads.

The **greatest** riser height within any flight of stairs **shall not exceed the smallest** by more than 3/8".

**TREAD DEPTH:** The minimum tread depth shall be 9 inches. The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge.

The **greatest** tread depth within any flight of stairs **shall not exceed the smallest** by more than 3/8 inch.

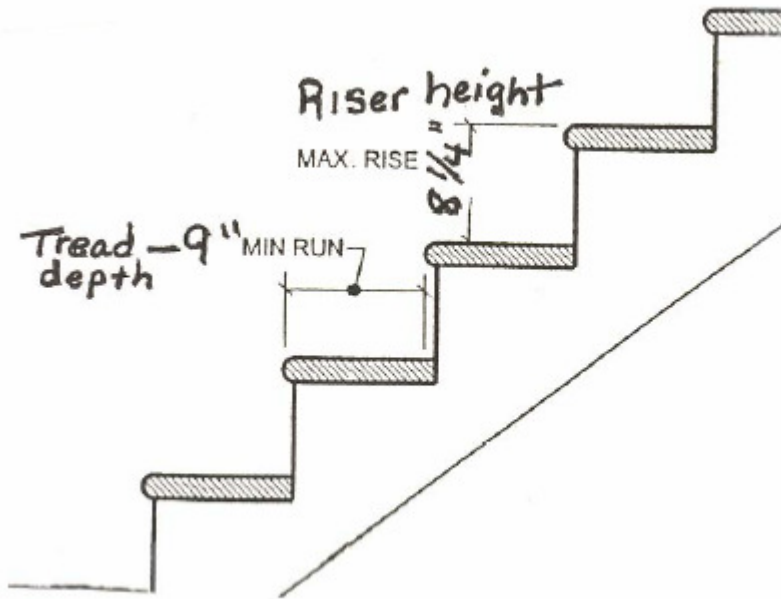
Winder and circular stairway treads shall have a minimum tread depth of 9 inches measured as above at a point 12 inches from the sides where the treads are narrower.

Winder treads shall have a minimum tread depth of 6 inches at any point. The greatest winder tread depth at the 12-inch walk line within any flight of stairs shall not exceed the smallest by more than 3/8 inch.

The greatest circular tread depth at any walking line within any circular flight of stairs, measured at a consistent distance from a side of the stairway, shall not exceed the smallest by more than 3/8 inch.

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### GUARDS

When guards are required, porches, balconies or raised floor surfaces located more than 30 inches (762 mm) above the floor or grade below shall have guards not less than 36 inches (914mm) in height.

Open sides of stairs with a total rise of more than 30 inches (762 mm) above the floor or grade below shall have guards not less than 34 inches (864 mm) in height measured vertically from the nosing of the treads. Porches and decks which are enclosed with insect screening shall be provided with guards where the walking surface is located more than 30 inches (762 mm) above the floor or grade below. R312.2

#### Guard opening limitations.

Required guards on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails or ornamental closures which do not allow passage of a sphere 4 inches (102mm) or more in diameter.

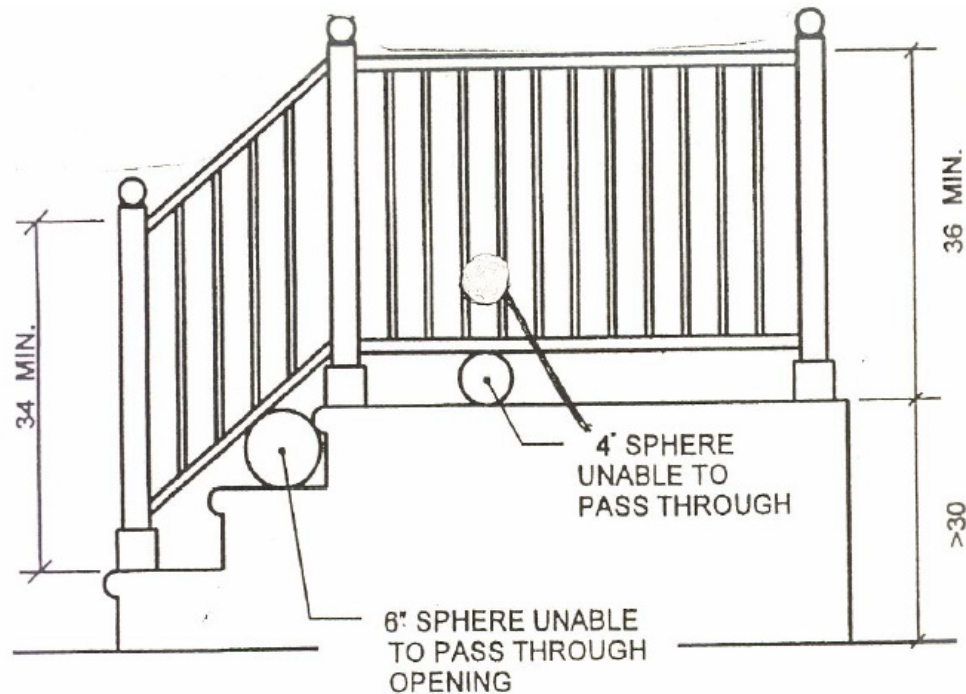
#### Exceptions:

1. The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway are permitted to be of such a size that a sphere 6 inches (152 mm) cannot pass through.

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2. Openings for required guards on the sides of stair treads shall not allow a sphere 4 3/8" inches (107 mm) to pass through.



## HANDRAILS

**HANDRAIL GRIP SIZE:** All required handrails shall be of one of the following types or provide equivalent grasp ability.

Type I: Handrails with a circular cross section shall have an outside diameter of at least 1 1/4 inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6 1/4 inches (160 mm) with a maximum cross section of a dimension of 2 1/4 inches (57 mm).

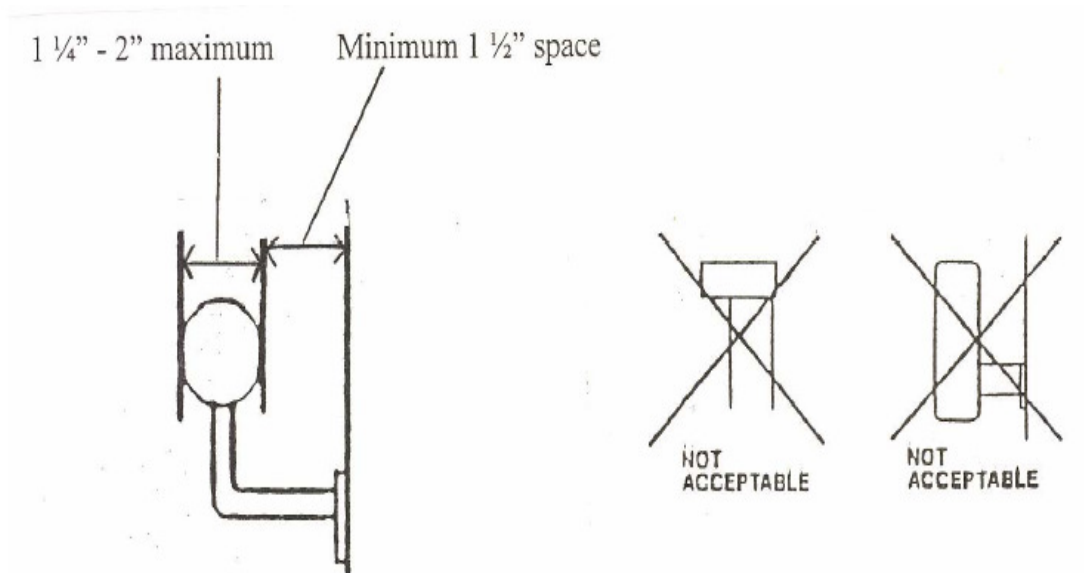
Type II: Handrails with a perimeter greater than 6 1/4 inches (160 mm) shall provide a grasp able finger recess area on both sides of the profile. The finger recess shall begin within a distance of 3/4" inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16 inch (8 mm) within 7/8 inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least 3/8" (10 mm) to a level that is not less than 1 3/4 inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 1/4 inches (32 mm) to a maximum of 2 3/4" inches (70 mm). Edges shall have a minimum radius of 0.01 inches (0.25 mm).

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**CONTINUITY:** Handrails for stairways shall be continuous for the full length of each flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned to a wall or shall terminate in newel posts or safety terminations. Handrails adjacent to a wall shall have a space of not less than 1/2 inch between the wall and the handrails.

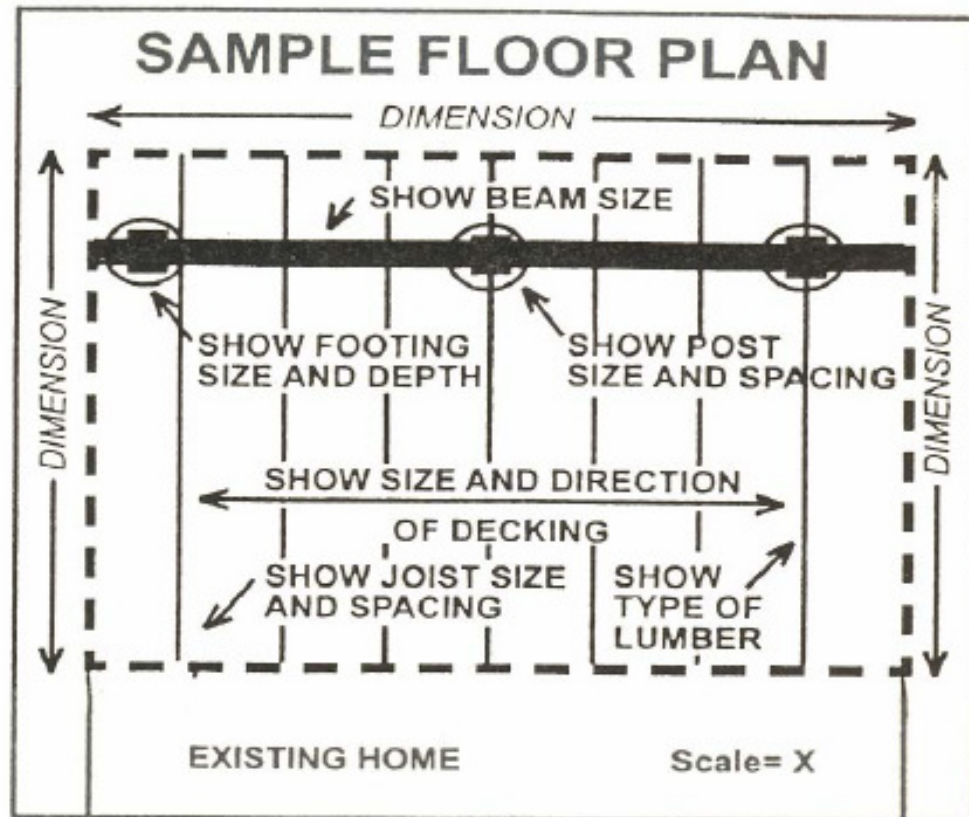
**Exceptions:** 1. Handrails shall be permitted to be interrupted by a newel post at a level landing. 2. The use of a volute, turnout, starting easing or starting newel shall be permitted over the lowest tread.



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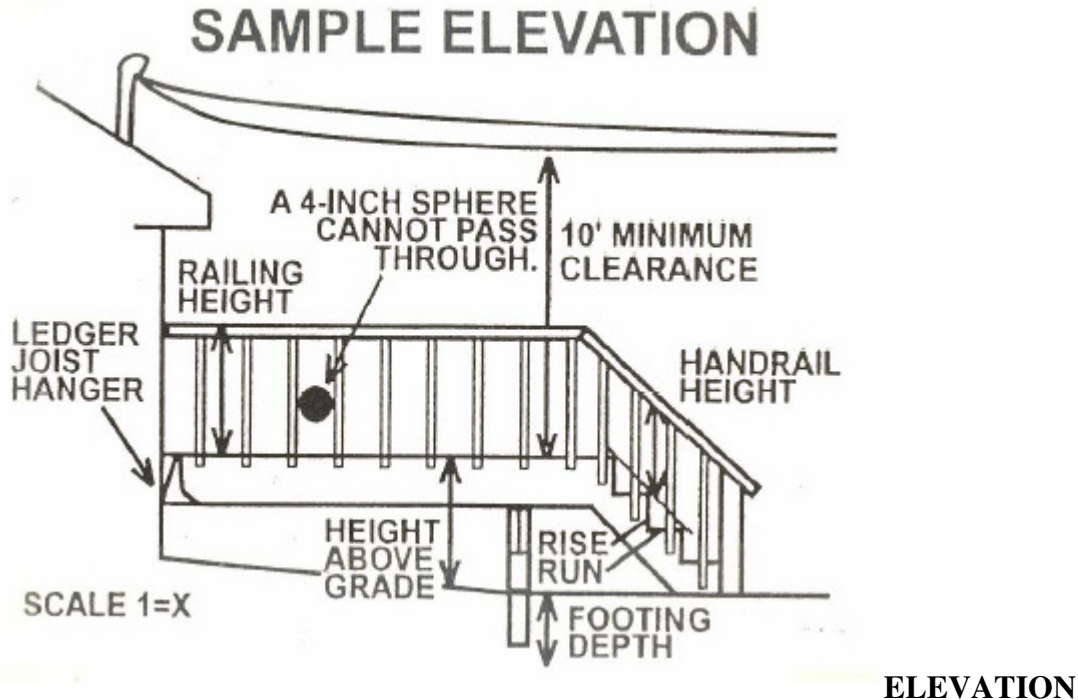
### FLOOR PLAN



1. Proposed deck size.
2. Size and spacing of floor joists.
3. Size and type of decking material.
4. Size, type, location, and spacing of posts.
5. Size and type of beams.

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### PLAN

1. Height of structure from grade.
2. Size and depth of footings.
3. Guard height and spacing (if any).
4. Stairway rise/run and handrail height (if any).
5. Clearance of over-head wires (if applicable).
6. Ledger attachment details and flashing information.

### IMPORTANT INFORMATION REGARDING DECKS AND HARDWARE

Connecticut State Building Code Section R319.3 amends the 2003 International Residential Code regarding fasteners allowed to be used on pressure preservative and fire retardant wood as follows:

(Amd) **R319.3** Fasteners and weight bearing connecting devices used for pressure preservative and fire-retardant treated wood shall be of stainless steel, silicon bronze, copper, G185 galvanized steel, or shall be hot-dipped after fabrication. It is very important that when you purchase hardware, including lag screws, washers, joist hangers, screws and all other fasteners in contact with pressure treated wood, it meet these standards **or excessive corrosion will result.**

In addition aluminum flashing **cannot come in contact with preservative treated wood** unless it is painted or coated with material to prevent contact with lumber.

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Do not use old hardware on new preservative treated lumber either. There is a wealth of information available on the internet if you wish to further research this issue.

As an example: If purchasing Simpson hardware for a 2x8 joist hanger their designation of LUS28 would not be acceptable but would have to be stamped with LUS28Z.

The “Z” designation shows G185 standard is met and “HDG” designation shows hot dipped galvanized standard is met. Of course you may also use the other materials including stainless steel, copper or silicon bronze, but this material is typically more expensive.

**TABLE 14 WET-SERVICE FLOOR JOISTS – 40 PSF LIVE LOAD, 10 PSF DEAD LOAD, 360 DEFLECTION**  
DECKS; MOISTURE CONTENT EXCEEDS 19%

Size inches	Spacing inches on center	Grade									
		Visually Graded				Machine Stress Rated (MSR)			Machine Evaluated Lumber (MEL)		
		SS	No.1	No.2	No.3	2400I-2.0E	2250I-1.9E	1950I-1.7E	M21	M14	M21
<b>2 x 6</b>	<b>12.0</b>	10-9	10-7	10-4	9-4	11-2	11-0	10-7	10-9	10-7	10-7
	<b>16.0</b>	9-9	9-7	9-5	8-1	10-2	10-0	9-7	9-9	9-7	9-7
	<b>19.2</b>	9-2	9-0	8-9	7-4	9-6	9-4	9-0	9-2	9-0	9-0
	<b>24.0</b>	8-7	8-5	7-10	6-7	8-10	8-8	8-5	8-7	8-5	8-5
<b>2 x 8</b>	<b>12.0</b>	14-2	13-11	13-8	11-11	14-8	14-5	13-11	14-2	13-11	13-11
	<b>16.0</b>	12-11	12-8	12-5	10-3	13-4	13-2	12-8	12-11	12-8	12-8
	<b>19.2</b>	12-2	11-11	11-4	9-5	12-7	12-4	11-11	12-2	11-11	11-11
	<b>24.0</b>	11-3	11-1	10-2	8-5	11-8	11-6	11-1	11-3	11-1	11-1
<b>2 x 10</b>	<b>12.0</b>	18-1	17-9	17-5	14-0	18-9	18-5	17-9	18-1	17-9	17-9
	<b>16.0</b>	16-5	16-2	15-10	12-2	17-0	16-9	16-2	16-5	16-2	16-2
	<b>19.2</b>	15-6	15-1	14-8	11-1	16-0	15-9	15-2	15-6	15-2	15-2
	<b>24.0</b>	14-4	13-6	13-1	9-11	14-11	14-8	14-1	14-4	14-1	14-1
<b>2 x 12</b>	<b>12.0</b>	22-0	21-7	21-2	16-8	22-10	22-5	21-7	22-0	21-7	21-7
	<b>16.0</b>	20-0	19-8	18-10	14-6	20-9	20-4	19-8	20-0	19-8	19-8
	<b>19.2</b>	18-10	17-11	17-2	13-2	19-6	19-2	18-6	18-10	18-6	18-6
	<b>24.0</b>	17-6	16-1	15-5	11-10	18-1	17-10	17-2	17-6	17-2	17-2

These spans are intended for use in enclosed structures or where the moisture content in use does not exceed 19 percent for an extended period of time unless the table is labeled Wet-Service. Applied loads are given in psf (pounds per square foot). Deflection is limited to the span in inches divided by 360, 240, or 180 and is based on live load only. The load duration factor, C<sub>D</sub>, is 1.0 unless shown as 1.15 or 1.25. An asterisk (\*) indicates the listed span has been limited to 26'0" based on availability; check sources of supply for lumber longer than 20'. Highlighted sizes/grades are NOT commonly produced.

MAXIMUM SPANS: SOUTHERN PINE JOISTS & RAFTERS  
SOUTHERN PINE COUNCIL

2003  
Edition **14**

The Southern Pine Council does not grade or test lumber, and accordingly, does not assign design values to Southern Pine lumber. The design values contained herein are based on the 2002 *SP/IB Standard Grading Rules for Southern Pine Lumber*, published by the Southern Pine Inspection Bureau, and modified as required by the 2001 *National Design Specification® (NDS®) for Wood Construction* published by the American Forest & Paper Association (AF&PA).

The primary purpose of this publication is to provide a convenient reference for joist and rafter spans for specific grades of Southern Pine lumber. The maximum spans provided herein were determined on the same basis as those in *Span Tables for Joists and Rafters*, published by AF&PA. Accordingly, the Southern Pine Council, its principals and/or members, do not warrant in any way that the design values on which the span tables for Southern lumber contained herein are based are correct, and specifically disclaim any liability for injury or damage resulting from the use of such span tables.

The conditions under which lumber is used in construction may vary widely, as does the quality of lumber and workmanship. Neither the Southern Pine Council, nor its principals and/or members have any knowledge of the construction methods, quality of materials and workmanship used on any construction project; and accordingly, cannot and do not, warrant the performance of the lumber used in completed structures.

## **DECK GUIDELINES**

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*The Town of Tolland Building Department is offering this handout as service to our customers. The town assumes no responsibility for any errors or omissions. The installer is required to follow all applicable codes. Please refer to 2005 State Building Code as amended by 2009 Connecticut Supplement including 2007 Amendments for complete details.*