

THE CITY OF EASTLAKE
35150 Lakeshore Boulevard Eastlake, Ohio 44095
440-951-1416

GUIDELINE FOR RAMPS

This guideline is being provided to you to assist you in your ramp project. It contains a basic ramp layout and current code references that are pertinent to ramp construction. There may be items contained within these guidelines that may or may not be applicable to your project.

There are not many resources for designing ramps. The current adopted Residential Code of Ohio and the current adopted ADAAG manual which contains the accessibility requirements for the Americans with Disability Act are about the only reference materials for designing ramps. They contain the code information along with pictorials showing the requirements for ramps. Ramps in general, are built similar to decks in construction. The main difference is there are sloped walking surfaces along with level surfaces contained in a ramp. I have provided attachments that show items used for deck building which can also be used for ramp construction. Please review these guidelines when designing your project. If your project is similar to the example provided, you may use the attached form and fill in the appropriate blanks and return the forms to the Building Department for plan review and to obtain a permit. If your ramp is not similar to the example provided, then provide a drawing of how it will be constructed. We will need 2 copies of a site plan showing the setback of the ramp from the property lines and 2 copies of your ramp plans.

Inspections are required, and a 24 hour notice would be appreciated.

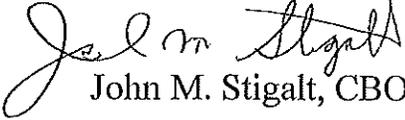
A list of basic inspections include, but not limited to:

- Zoning (location)
- Footer
- Rough Framing (may be omitted and performed at the time of the final inspection if framing can be adequately seen from underneath).
- Grading (may be omitted and performed at the time of the final inspection if grading can be adequately seen from underneath).
- Final

We appreciate your effort in enhancing your home. By providing you with these guidelines, I feel that you will have a code compliant ramp to serve your needs.

If you have any questions or if we can be of any assistance to you in any way, please feel free to contact the Building Department at 440-951-1416. The Building Department hours are Monday through Friday 8:00 A.M to 4:30 P.M.

Thank you,


John M. Stigalt, CBO

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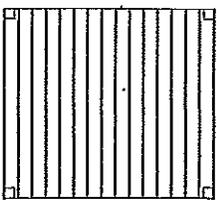
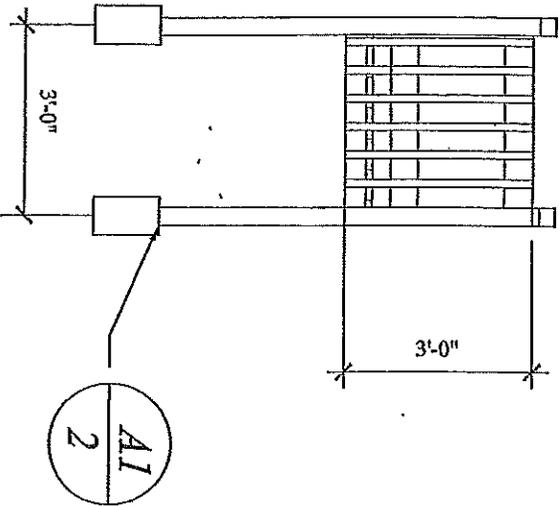
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POST SPACING _____ O/C.

NUMBER OF POSTS _____

DEPTH OF POSTS 42" MIN. TABLE R301.2 (1) RCO

FOOTER SIZE (SEE TABLE R403.4) _____



TOP FLOORING



TOP FRAMING

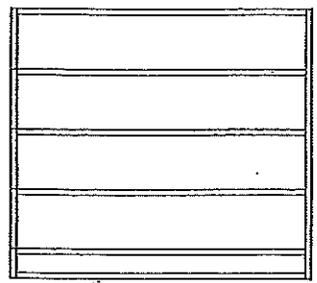
SIDE ELEVATION/TOP VIEWS

The City of

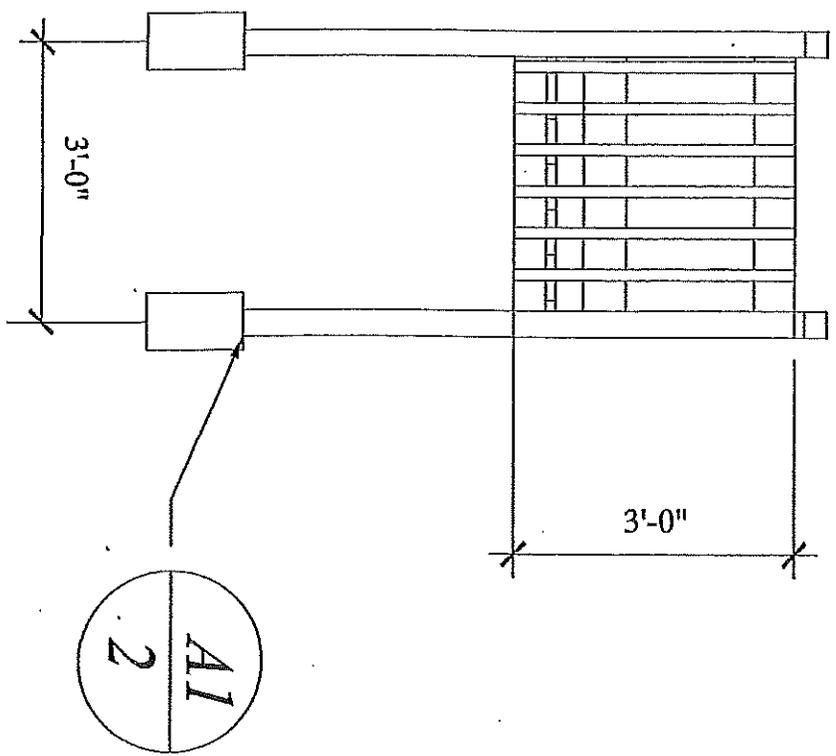
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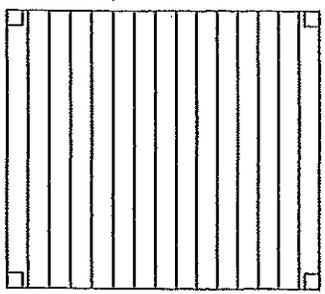
BUILDING DEPARTMENT



TOP FRAMING



SIDE ELEVATION/TOP VIEWS



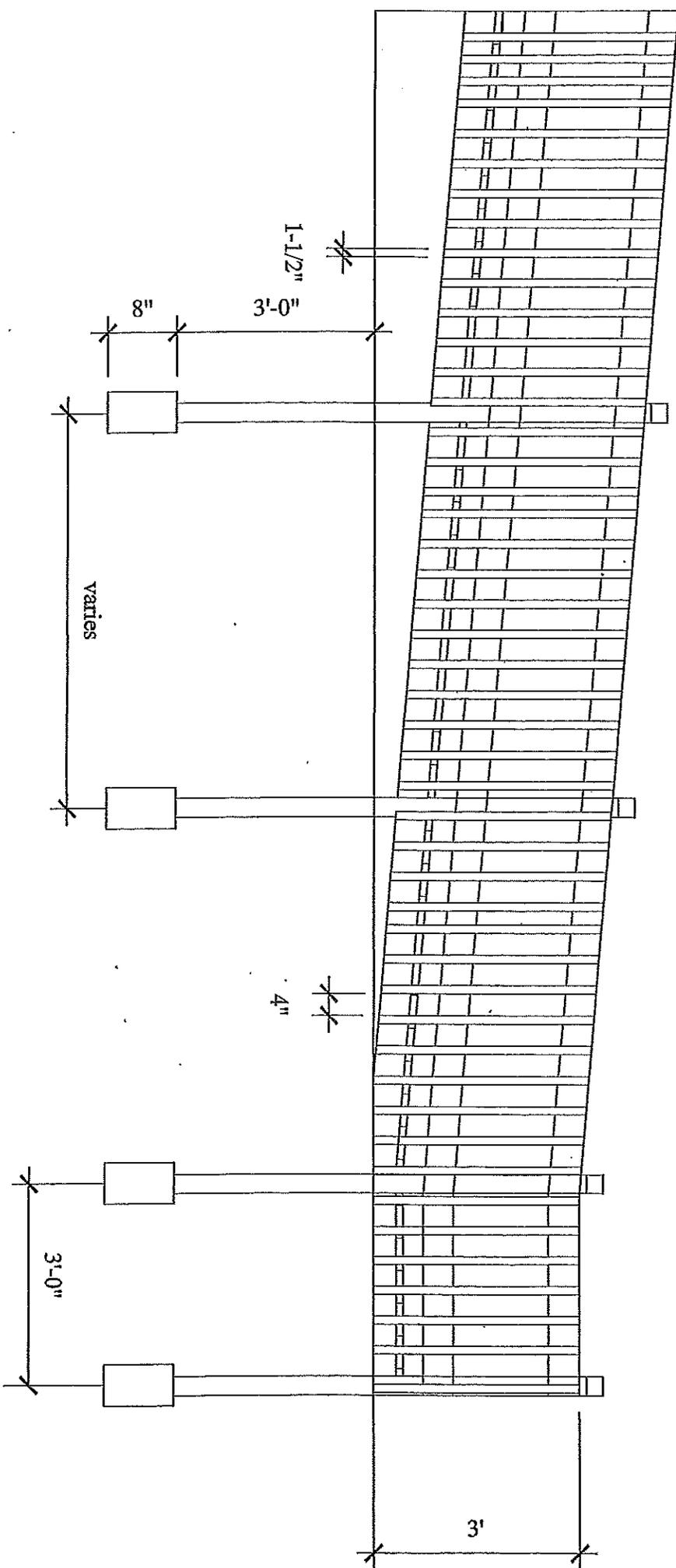
TOP FLOORING



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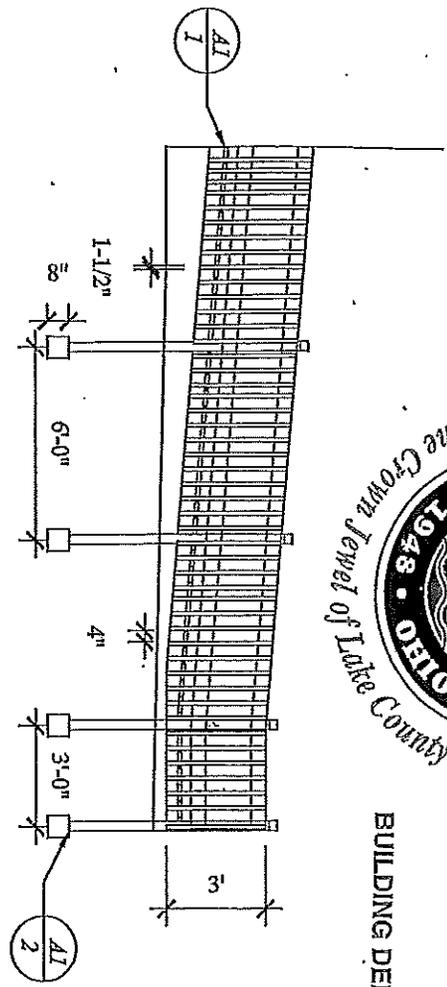
LEFT ELEVATION



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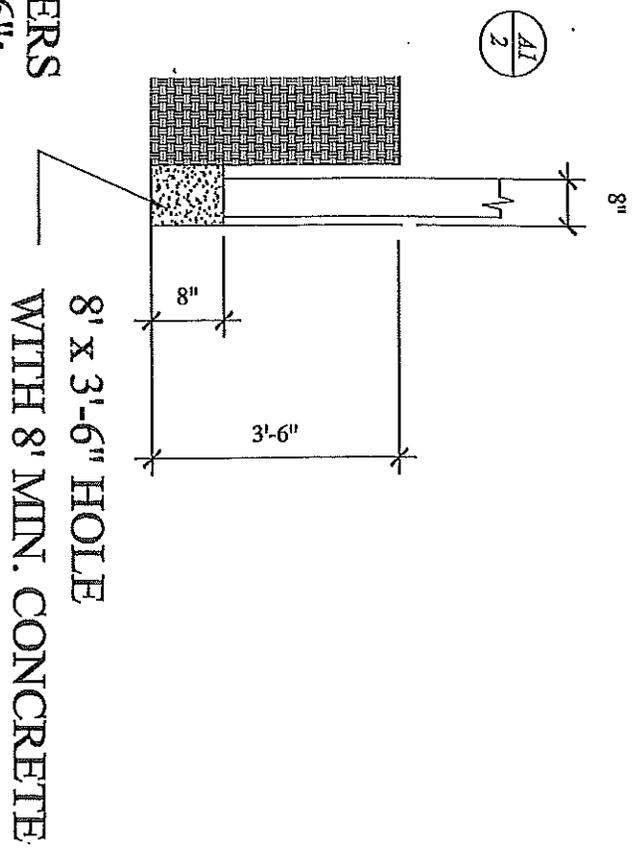
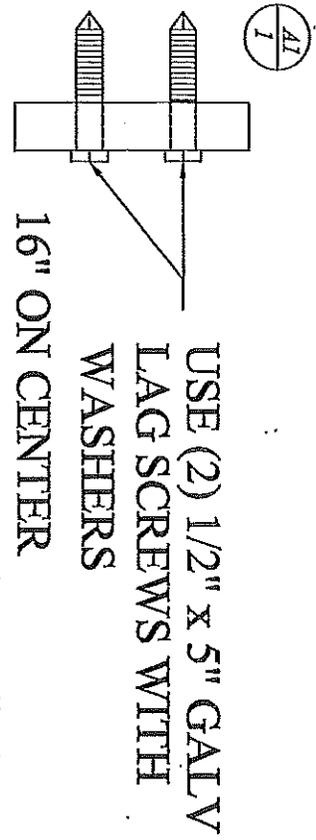
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LEFT ELEVATION

GENERAL NOTES:

- 1) ALL WOOD TO BE PRESSURE TREATED.
- 2) RAMP SLOPE PER SECTION R311.6.1 2006 RESIDENTIAL CODE OF OHIO.
- 3) RAMPS TO FOLLOW SECTIONS R311.6 AND R322 2006 RESIDENTIAL CODE OF OHIO.
- 4) POSTS TO BE MIN. 4" x 4"; ALL FRAMING MEMBERS TO BE MIN. 2" x 6"; FLOORING TO BE MIN. 5/4" x 6"; SPINDLES TO BE MIN. 2"x2".
- 5) FRAMING SUPPORTS TO BE SECURED TO POSTS WITH 1/2" x 6" HEX BOLTS WITH WASHERS AND NUTS.
- 6) ALL FASTENERS TO BE RATED OUTDOOR USE.

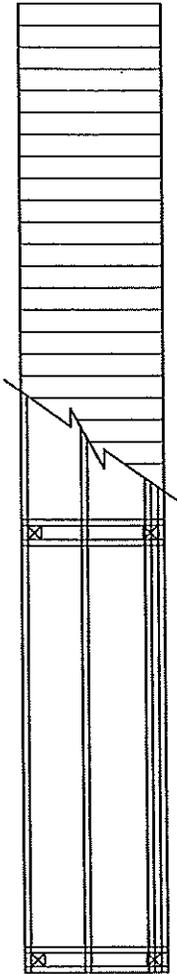




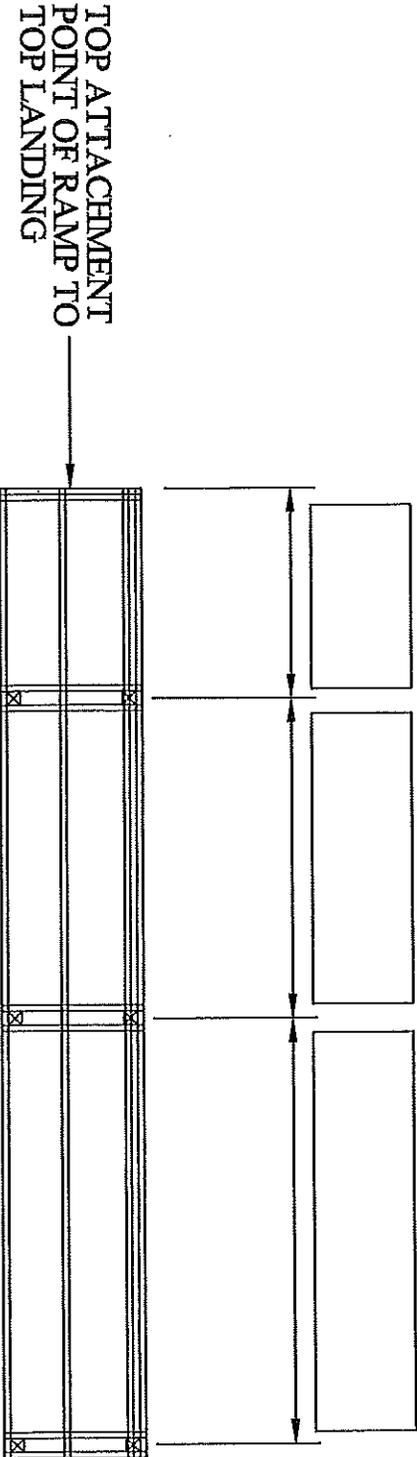
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TOP VIEW WITH FINISHED FLOORING



TOP VIEW WITHOUT FINISHED FLOORING

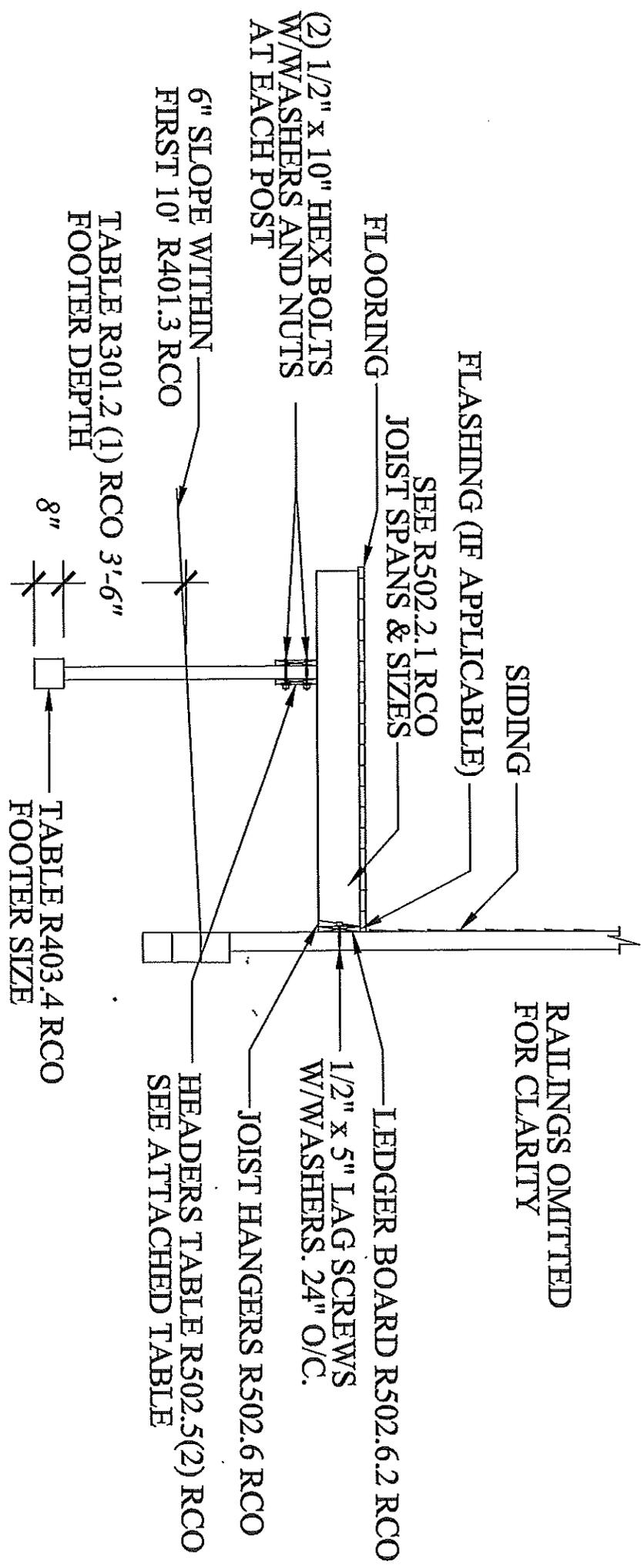


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RAILINGS OMITTED
 FOR CLARITY



RAMP LANDING SIDE VIEW



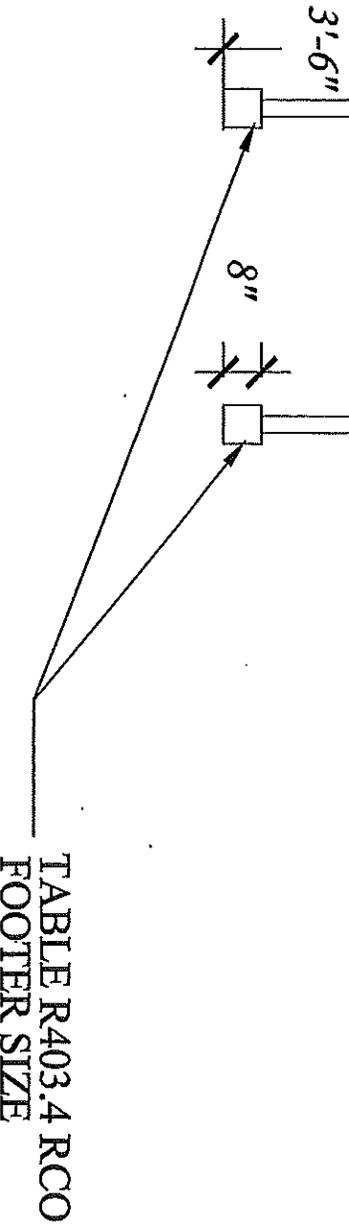
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RAILINGS OMITTED
FOR CLARITY

HEADERS TABLE R502.5(2) RCO
SEE ATTACHED TABLE

TABLE R301.2 (1) RCO
FOOTER DEPTH

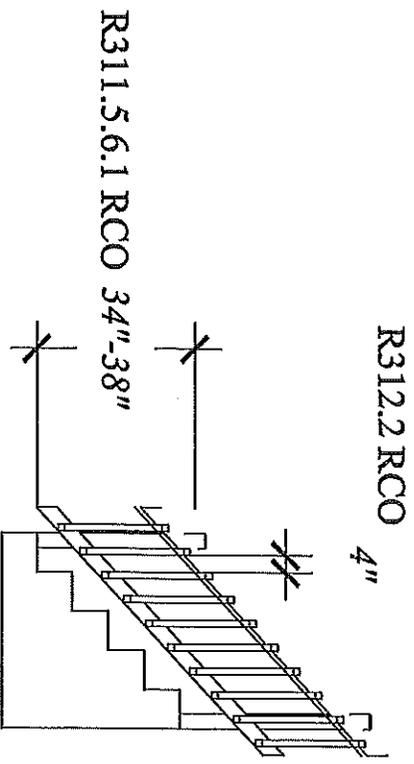


DETACHED RAMP LANDING SIDE VIEW

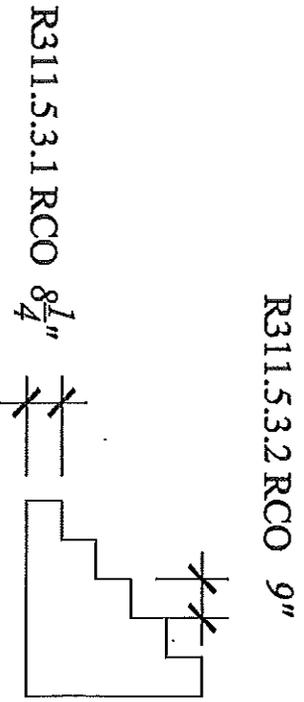


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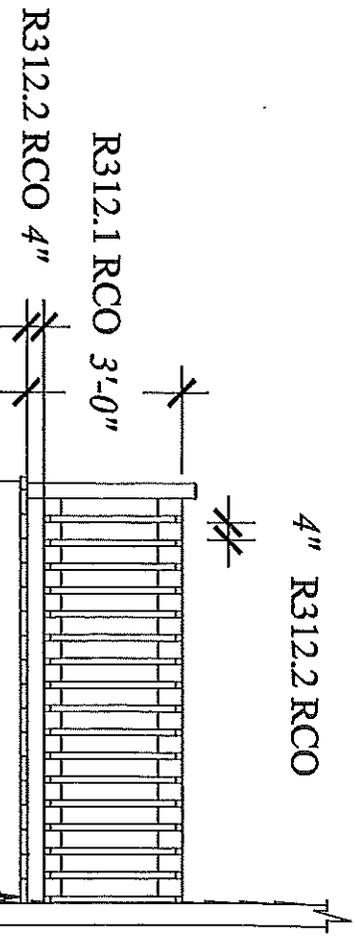
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STAIR/GUARDRAIL/HANDRAIL DETAIL



STAIR DETAIL



RAMP LANDING RAILING DETAIL

GENERAL CODE NOTES

TABLE R301.2 (1) GENERAL DESIGN CRITERIA

GROUND SNOW LOAD	WIND SPEED (MPH)	SEISMIC DESIGN CATEGORY	WEATHERING	FROST DEPTH
30 LB	90	A/B	SEVERE	42"

TABLE R301.5 MINIMUM LIVE LOADS

DECKS RAMP	EXTERIOR BALCONIES	GUARDRAILS/HANDRAILS	GUARDRAIL IN-FILL COMPONENTS	STAIRS
40 PSF	60 PSF	200 PSF	50 PSF	40 PSF

TABLE R403.4

DIAMETER	SQUARE	MAX. TRIBUTARY AREA ALLOWED PER POST
8"	8" X 8"	14 SQ. FT.
10"	9" X 9"	22 SQ. FT.
12"	11" X 11"	31.6 SQ. FT.
14"	13" X 13"	42.8 SQ. FT.
16"	15" X 15"	56 SQ. FT.
18"	16" X 16"	70.8 SQ. FT.
20"	18" X 18"	87.2 SQ. FT.

R401.3 DRAINAGE

LOTS SHALL BE GRADED SO AS TO DRAIN SURFACE WATER AWAY FROM FOUNDATION WALLS. THE GRADE AWAY FROM FOUNDATION WALLS SHALL BE A MINIMUM OF 6" WITHIN THE FIRST 10'.

R502.2.1 ATTACHMENT

LEDGER BOARD TO BE POSITIVELY ANCHORED TO MAIN STRUCTURE FOR BOTH VERTICAL AND LATERAL LOADS. SUCH ATTACHMENT SHALL NOT BE ACCOMPLISHED BY USE OF NAILS SUBJECT TO WITHDRAWAL.

R502.3 FLOOR JOIST SPANS

SEE TABLE R502.3.1 (2) ATTACHED

R311.5 STAIRS

STAIRS SHALL BE A MINIMUM OF 36" IN WIDTH

R311.5.3.1 STAIR RISER HEIGHT

THE MAXIMUM RISER HEIGHT SHALL BE 8-1/4"

R311.5.3.2 STAIR TREAD DEPTH

THE MINIMUM TREAD DEPTH SHALL BE 9"

R311.6.3 HANDRAILS

HANDRAILS SHALL BE PROVIDED ON AT LEAST ONE SIDE OF ALL RAMPS EXCEEDING A SLOPE OF 1:12.

R311.6.3.1 HANDRAIL HEIGHT

HANDRAIL HEIGHT SHALL BE A MINIMUM OF 34" AND NOT MORE THAN 38" ABOVE THE RAMP SURFACE.

R311.6.3.3 CONTINUITY

HANDRAILS SHALL BE CONTINUOUS FOR THE FULL LENGTH OF THE RAMP. HANDRAILS SHALL BE RETURNED OR TERMINATE INTO NEWEL POSTS OR SAFETY TERMINALS. HANDRAILS ADJACENT TO A WALL SHALL HAVE A SPACE OF NOT LESS THAN 1.5 INCHES BETWEEN THE WALL AND THE HANDRAILS.

GENERAL CODE NOTES CONTINUED

R311.5.6 HANDRAILS

HANDRAILS SHALL BE PROVIDED ON AT LEAST ONE SIDE OF A FLIGHT OF STAIRS WITH 4 OR MORE RISERS.

R311.5.6.1 HANDRAIL HEIGHT

HANDRAIL HEIGHT SHALL BE A MINIMUM OF 34" AND NOT MORE THAN 38".

R311.5.6.2 CONTINUITY

HANDRAILS SHALL BE CONTINUOUS FOR THE FULL FLIGHT OF STAIRS TO A POINT DIRECTLY ABOVE THE TOP RISER TO A POINT DIRECTLY ABOVE THE LOWEST RISER. HANDRAILS SHALL BE RETURNED OR TERMINATE INTO NEWEL POSTS OR SAFETY TERMINAL.

R312.1 GUARDS

PORCHES, BALCONIES OR RAISED FLOOR SURFACES LOCATED MORE THAN 30" ABOVE THE FLOOR OR GRADE SHALL HAVE GUARDS NOT LESS THAN 36" IN HEIGHT. OPEN SIDES OF STAIRS WITH A TOTAL RISE OF 30" OR MORE ABOVE THE FLOOR OR GRADE SHALL HAVE GUARDS NOT LESS THAN 34" IN HEIGHT.

R312.2 GUARD OPENING LIMITATIONS

THE GUARDS SHALL HAVE INTERMEDIATE RAILS OR ORNAMENTAL CLOSURES THAT DO NOT ALLOW A 4" SPHERE OR MORE IN DIAMETER TO PASS THROUGH.

LOCATION ON LOT

DECKS SHALL BE SETBACK A MINIMUM OF 20' FROM ALL PROPERTY LINES.

R319.1.3 PRESSURE TREATED LUMBER USE

POSTS, POLES AND COLUMNS SUPPORTING STRUCTURES THAT ARE EMBEDDED IN CONCRETE IN DIRECT CONTACT WITH THE GROUND OR EMBEDDED IN CONCRETE EXPOSED TO THE WEATHER.

R319.1.#6 PRESSURE TREATED LUMBER USE

WOOD STRUCTURAL MEMBERS SUPPORTING FLOORS OR ROOFS EXPOSED TO THE WEATHER.

R319.1.2 PRESSURE TREATED LUMBER USE

WOOD MEMBERS USED ON BALCONIES, PORCHES, SUPPORTS OF BUILDINGS OR SIMILAR PERMANENT BUILDING APPURTENANCES SUCH AS DECKING, GRIDDERS, JOISTS, POSTS, POLES AND COLUMNS.

R319.3 FASTENERS

FASTENERS FOR PRESSURE PRESERVATIVE WOOD SHALL BE OF HOT-DIPPED GALVANIZED STEEL, STAINLESS STEEL, SILICON BRONZE OR COPPER.

MINIMUM GRADE OF LUMBER

MINIMUM GRADE SHALL BE #2. SEE FOOTNOTE "b" TABLE R502.5(2) ATTACHED.

GENERAL CODE NOTES CONTINUED

R502.6 BEARING.

THE ENDS OF EACH JOIST(S), GIRDER(S) OR BEAM(S) SHALL BEAR A MINIMUM OF 1-1/2" ON WOOD OR METAL OR BY THE USE OF AN APPROVED JOIST HANGER(S).

R502.6.2 JOIST FRAMING

JOISTS FRAMING INTO THE SIDE OF A WOOD GIRDER SHALL BE SUPPORTED BY APPROVED FRAMING ANCHORS OR ON LEDGER STRIP(S) NOT LESS THAN 2" x 2".

R502.7 LATERAL SUPPORTS.

JOIST(S) END(S) SHALL BE SUPPORTED BY SOLID BLOCKING NOT LESS THAN 2" IN THICKNESS OR BY ATTACHMENT TO A HEADER, BAND, OR A RIM JOIST OR WITH OTHER LATERAL SUPPORT METHODS TO PREVENT ROTATION.

R301.1.3 ENGINEERED DESIGN

WHEN ELEMENTS NOT CONFORMING TO THIS CODE OR EXCEED THE LIMITS OF SECTION R301 SHALL BE DESIGNED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICE.

R403.4 MINIMUM THICKNESS OF FOOTER

MINIMUM THICKNESS OF FOOTER SHALL BE 8" UNDER EACH POST. REFERENCE SECTION R403.4

R311.5.3.3 OPEN RISERS

OPEN RISERS ARE PERMITTED PROVIDED THAT THE OPENING IS NO MORE THAN 4" ON STAIRS THAT ARE OVER 30 INCHES OF TOTAL RISE. REFERENCE SECTION R311.5.3.3.

R311.6.1 MAXIMUM SLOPE

RAMPS SHALL HAVE A MAXIMUM SLOPE OF ONE UNIT VERTICAL IN EIGHT UNITS HORIZONTAL (12.5-PERCENT SLOPE).

R311.6.2 LANDINGS REQUIRED

A MINIMUM 3' x 3' LANDING SHALL BE PROVIDED AT THE TOP AND BOTTOM OF THE RAMP(S), WHERE A DOOR OPENS ONTO A RAMP(S) AND WHERE RAMP(S) CHANGE DIRECTION.

R311.6.3.2 HANDRAIL GRIP SIZE

HANDRAILS ON RAMPS SHALL COMPLY WITH SECTION R311.5.6.3.

TABLE R502.3.1(2)
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES
(Residential living areas, live load = 40 psf, L/A = 360)

JOIST SPACING (Inches)	SPECIES AND GRADE	DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
		2x6	2x8	2x10	2x12	2x6	2x8	2x10	2x12
		Maximum floor joist spans							
		(ft.- in.)	(ft.- in.)	(ft.- in.)	(ft.- in.)	(ft.- in.)	(ft.- in.)	(ft.- in.)	(ft.- in.)
12	Douglas fir-larch SS	11-4	15-0	19-1	23-3	11-4	15-0	19-1	23-3
	Douglas fir-larch #1	10-11	14-5	18-5	22-0	10-11	14-2	17-4	20-1
	Douglas fir-larch #2	10-9	14-2	17-9	20-7	10-6	13-3	16-3	18-10
	Douglas fir-larch #3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Hem-fir SS	10-9	14-2	18-0	21-11	10-9	14-2	18-0	21-11
	Hem-fir #1	10-6	13-10	17-8	21-6	10-6	13-10	16-11	19-7
	Hem-fir #2	10-0	13-2	16-10	20-4	10-0	13-1	16-0	18-6
	Hem-fir #3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Southern pine SS	11-2	14-8	18-9	22-10	11-2	14-8	18-9	22-10
	Southern pine #1	10-11	14-5	18-5	22-5	10-11	14-5	18-5	22-5
	Southern pine #2	10-9	14-2	18-0	21-9	10-9	14-2	16-11	19-10
	Southern pine #3	9-4	11-11	14-0	16-8	8-6	10-10	12-10	15-3
	Spruce-pine-fir SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-6
	Spruce-pine-fir #1	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
	Spruce-pine-fir #2	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
	Spruce-pine-fir #3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
16	Douglas fir-larch SS	10-4	13-7	17-4	21-1	10-4	13-7	17-4	21-0
	Douglas fir-larch #1	9-11	13-1	16-5	19-1	9-8	12-4	15-0	17-5
	Douglas fir-larch #2	9-9	12-7	15-5	17-10	9-1	11-6	14-1	16-3
	Douglas fir-larch #3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
	Hem-fir SS	9-9	12-10	16-5	19-11	9-9	12-10	16-5	19-11
	Hem-fir #1	9-6	12-7	16-0	18-7	9-6	12-0	14-8	17-0
	Hem-fir #2	9-1	12-0	15-2	17-7	8-11	11-4	13-10	16-1
	Hem-fir #3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
	Southern pine SS	10-2	13-4	17-0	20-9	10-2	13-4	17-0	20-9
	Southern pine #1	9-11	13-1	16-9	20-4	9-11	13-1	16-4	19-6
	Southern pine #2	9-9	12-10	16-1	18-10	9-6	12-4	14-8	17-2
	Southern pine #3	8-1	10-3	12-2	14-6	7-4	9-5	11-1	13-2
	Spruce-pine-fir SS	9-6	12-7	16-0	19-6	9-6	12-7	16-0	19-6
	Spruce-pine-fir #1	9-4	12-3	15-5	17-10	9-1	11-6	14-1	16-3
	Spruce-pine-fir #2	9-4	12-3	15-5	17-10	9-1	11-6	14-1	16-3
	Spruce-pine-fir #3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
19.2	Douglas fir-larch SS	9-8	12-10	16-4	19-10	9-8	12-10	16-4	19-2
	Douglas fir-larch #1	9-4	12-4	15-0	17-5	8-10	11-3	13-8	15-11
	Douglas fir-larch #2	9-1	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Douglas fir-larch #3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
	Hem-fir SS	9-2	12-1	15-5	18-9	9-2	12-1	15-5	18-9
	Hem-fir #1	9-0	11-10	14-8	17-0	8-8	10-11	13-4	15-6
	Hem-fir #2	8-7	11-3	13-10	16-1	8-2	10-4	12-8	14-8
	Hem-fir #3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
	Southern pine SS	9-6	12-7	16-0	19-6	9-6	12-7	16-0	19-6
	Southern pine #1	9-4	12-4	15-9	19-2	9-4	12-4	14-11	17-9
	Southern pine #2	9-2	12-1	14-8	17-2	8-8	11-3	13-5	15-8
	Southern pine #3	7-4	9-5	11-1	13-2	6-9	8-7	10-1	12-1
	Spruce-pine-fir SS	9-0	11-10	15-1	18-4	9-0	11-10	15-1	17-9
	Spruce-pine-fir #1	8-9	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Spruce-pine-fir #2	8-9	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Spruce-pine-fir #3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
24	Douglas fir-larch SS	9-0	11-11	15-2	18-5	9-0	11-11	14-9	17-1
	Douglas fir-larch #1	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Douglas fir-larch #2	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Douglas fir-larch #3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1
	Hem-fir SS	8-6	11-3	14-4	17-5	8-6	11-3	14-4	16-10
	Hem-fir #1	8-4	10-9	13-1	15-2	7-9	9-9	11-11	13-10
	Hem-fir #2	7-11	10-2	12-5	14-4	7-4	9-3	11-4	13-1
	Hem-fir #3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1
	Southern pine SS	8-10	11-8	14-11	18-1	8-10	11-8	14-11	18-1
	Southern pine #1	8-8	11-5	14-7	17-5	8-8	11-3	13-4	15-11
	Southern pine #2	8-6	11-0	13-1	15-5	7-9	10-0	12-0	14-0
	Southern pine #3	6-7	8-5	9-11	11-10	6-0	7-8	9-1	10-9
	Spruce-pine-fir SS	8-4	11-0	14-0	17-0	8-4	11-0	13-8	15-11
	Spruce-pine-fir #1	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Spruce-pine-fir #2	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Spruce-pine-fir #3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1

NOTE: Check sources for availability of lumber in lengths greater than 20 feet.
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kN/m².
a. End bearing length shall be increased to 2 inches.

TABLE R502.5(2)
GIRDER SPANS^a AND HEADER SPANS^a FOR INTERIOR BEARING WALLS

(Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir^b and required number of jack studs)

HEADERS AND GIRDERS SUPPORTING	SIZE	BUILDING WIDTH ^c (feet)					
		20		28		36	
		Span	NJ ^d	Span	NJ ^d	Span	NJ ^d
One floor only	2-2×4	3-1	1	2-8	1	2-5	1
	2-2×6	4-6	1	3-11	1	3-6	1
	2-2×8	5-9	1	5-0	2	4-5	2
	2-2×10	7-0	2	6-1	2	5-5	2
	2-2×12	8-1	2	7-0	2	6-3	2
	3-2×8	7-2	1	6-3	1	5-7	2
	3-2×10	8-9	1	7-7	2	6-9	2
	3-2×12	10-2	2	8-10	2	7-10	2
	4-2×8	9-0	1	7-8	1	6-9	1
	4-2×10	10-1	1	8-9	1	7-10	2
	4-2×12	11-9	1	10-2	2	9-1	2
Two floors	2-2×4	2-2	1	1-10	1	1-7	1
	2-2×6	3-2	2	2-9	2	2-5	2
	2-2×8	4-1	2	3-6	2	3-2	2
	2-2×10	4-11	2	4-3	2	3-10	3
	2-2×12	5-9	2	5-0	3	4-5	3
	3-2×8	5-1	2	4-5	2	3-11	2
	3-2×10	6-2	2	5-4	2	4-10	2
	3-2×12	7-2	2	6-3	2	5-7	3
	4-2×8	6-1	1	5-3	2	4-8	2
	4-2×10	7-2	2	6-2	2	5-6	2
4-2×12	8-4	2	7-2	2	6-5	2	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Spans are given in feet and inches.

b. Tabulated values assume #2 grade lumber.

c. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

d. NJ -Number of jack studs required to support each end. Where the number of required jack studs equals one, the header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header.

R502.6 Bearing. The ends of each joist, beam or girder shall have not less than 1.5 inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on masonry or concrete except where supported on a 1-inch-by-4-inch (25.4 mm by 102 mm) ribbon strip and nailed to the adjacent stud or by the use of approved joist hangers.

R502.6.1 Floor systems. Joists framing from opposite sides over a bearing support shall lap a minimum of 3 inches (76 mm) and shall be nailed together with a minimum three 10d face nails. A wood or metal splice with strength equal to or greater than that provided by the nailed lap is permitted.

R502.6.2 Joist framing. Joists framing into the side of a wood girder shall be supported by approved framing anchors or on

ledger strips not less than nominal 2 inches by 2 inches (51 mm by 51 mm).

R502.7 Lateral restraint at supports. Joists shall be supported laterally at the ends by full-depth solid blocking not less than 2 inches (51 mm) nominal in thickness; or by attachment to a header, band, or rim joist, or to an adjoining stud; or shall be otherwise provided with lateral support to prevent rotation.

Exception: In Seismic Design Categories D₁ and D₂, lateral restraint shall also be provided at each intermediate support.

R502.7.1 Bridging. Joists exceeding a nominal 2 inches by 12 inches (51 mm by 305 mm) shall be supported laterally by solid blocking, diagonal bridging (wood or metal), or a continuous 1-inch-by-3-inch (25.4 mm by 76 mm) strip nailed across the



Deck Framing Connection Guide



RECOMMENDATIONS FOR THE CONSTRUCTION OF CODE-COMPLIANT DECKS



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A WORD ABOUT BUILDING CODES

This guide recommends connectors and fasteners for deck construction that may meet the requirements of the 2006 International Building Code® and the 2006 International Residential Code®. The information contained here is a summary of the requirements of these codes as they pertain to the connections highlighted in this guide. The building codes contain other requirements regarding aspects of deck construction that are not addressed here, check the codes for details. Check with your local building department to verify what building codes have been adopted in your area.

Selection of products based upon performance and/or suitability for a specific application should be made by a qualified professional. Simpson recommends that product choice be approved by the local building department before construction begins.

International Building Code and International Residential Code are registered trademarks of their respective organizations.

LIMITED WARRANTY

Simpson Strong-Tie Company Inc. warrants catalog products to be free from defects in material or manufacturing. Simpson Strong-Tie Company Inc. products are further warranted for adequacy of design when used in accordance with design limits in this catalog and when properly specified, installed, and maintained. This warranty does not apply to uses not in compliance with specific applications and installations set forth in this catalog, or to non-catalog or modified products, or to deterioration due to environmental conditions.

Simpson Strong-Tie® connectors are designed to enable structures to resist the movement, stress, and loading that results from impact events such as earthquakes and high velocity winds. Other Simpson Strong-Tie products are designed to the load capacities and uses listed in this catalog. Properly-installed Simpson Strong-Tie products will perform in accordance with the specifications set forth in the applicable Simpson catalog. Additional performance limitations for specific products may be listed on the applicable catalog pages.

Due to the particular characteristics of potential impact events, the specific design and location of the structure, the building materials used, the quality of construction, and

the condition of the soils involved, damage may nonetheless result to a structure and its contents even if the loads resulting from the impact event do not exceed Simpson catalog specifications and Simpson Strong-Tie connectors are properly installed in accordance with applicable building codes.

All warranty obligations of Simpson Strong-Tie Company Inc. shall be limited, at the discretion of Simpson Strong-Tie Company Inc., to repair or replacement of the defective part. These remedies shall constitute Simpson Strong-Tie Company Inc.'s sole obligation and sole remedy of purchaser under this warranty. In no event will Simpson Strong-Tie Company Inc. be responsible for incidental, consequential, or special loss or damage, however caused.

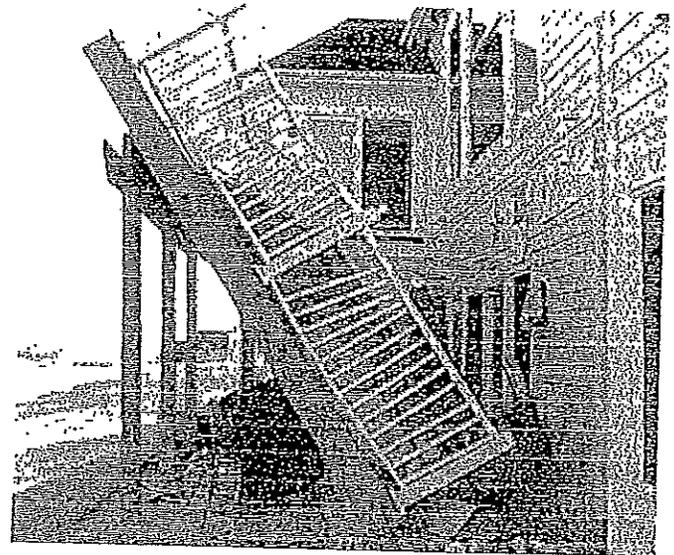
This warranty is expressly in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose, all such other warranties being hereby expressly excluded. This warranty may change periodically – consult our website www.strongtie.com for current information.

INTRODUCTION

IMPROPERLY BUILT DECKS CAN BE DANGEROUS

Decks cause more injuries and loss of life than any other part of the home structure.

— Don Bender, Director, Wood Materials and Engineering Laboratory, Washington State University



More than a million decks are built and replaced each year in the United States. While decks are a popular feature of many homes, the construction and safety of decks have become a real concern within the building industry. Improper deck building has resulted in a growing number of deck failures and related injuries and deaths.

According to Don Bender, the director of the Wood Materials and Engineering Laboratory at Washington State University, the deck is the most dangerous part of the house. Washington State Magazine's article *Making Decks Safer* reports "Decks cause more injuries and loss of life than any other part of the home structure. Except for hurricanes and tornadoes, more injuries may be connected to deck failures than all other wood building components and loading cases combined."

While decks are required to meet certain code standards and load capacities, it's estimated that of the 40 million existing decks, only half are code compliant – leaving 20 million decks that need to be rebuilt or retrofitted.

To help design and building professionals build code-compliant, safe decks, Simpson Strong-Tie® has created this *Deck Framing Connection Guide*. This guide focuses on the critical connections involved in deck construction and what the code requires for these areas. It is intended to help designers, contractors, inspectors and do-it-yourselfers ensure that their decks are properly constructed per the International Building Code® (IBC) and International Residential Code® (IRC). The guide includes a complete deck connector system that covers all the hardware needs for deck construction and references the code to ensure it meets current requirements.

DO DECKS REALLY NEED TO MEET CODE REQUIREMENTS?

Because they look relatively simple to build, many people do not realize that decks are structures that need to be designed to adequately resist certain stresses. Like a house, or any other building, a deck must be designed to support the weight of people and objects placed on them, as well as lateral and uplift loads that can act on the deck as a result of wind or seismic activity. The 2006 versions of both the IBC and IRC contain language outlining the general design requirements of structures. This excerpt from the IRC represents a summary of the intent of both codes:

"The construction of buildings and structures in accordance with the provisions of this code shall result in a system that provides a complete load path that meets all requirements for the transfer of all loads from their point of origin through the load-resisting elements to the foundation."

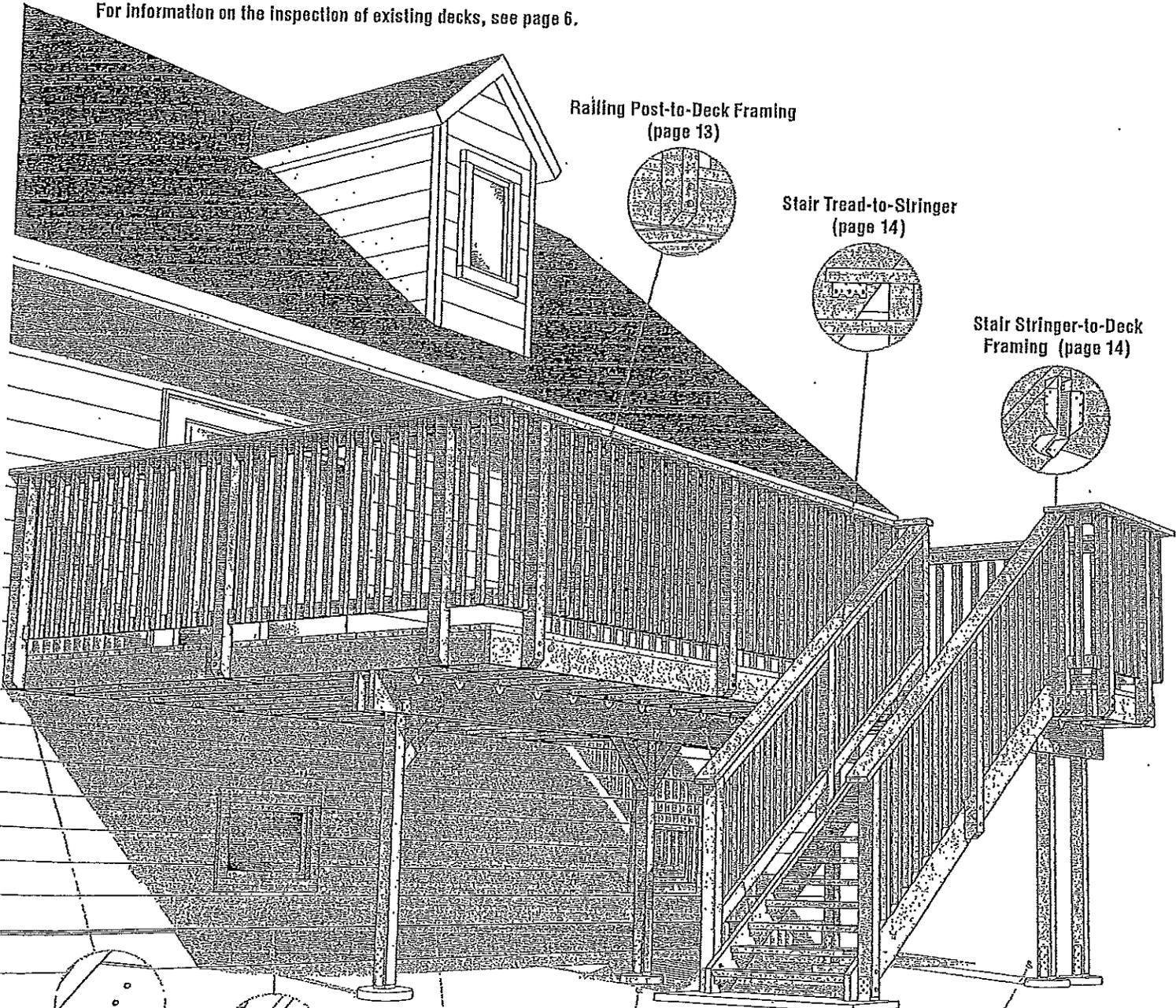
The concept of a complete or continuous load path refers to a series of solid connections within the structure of a deck that transfer load through its frame to the ground or adjacent, supporting structure (commonly a building). This same principle is applied to the design of all types of wood frame buildings. This continuous load path is created by using a system of structural connectors and fasteners to connect the wood members together.

CRITICAL DECK CONNECTIONS

A system of key connections throughout the deck framing, also known as a continuous load path, is essential to building a safe, code-compliant deck. When this system of connections is made properly, loads are transferred throughout the deck's frame and into the ground and /or the adjacent structure to which the deck is connected.

The connections called out below are necessary in order to create an effective continuous load path.

For information on the inspection of existing decks, see page 6.



Railing Post-to-Deck Framing
(page 13)

Stair Tread-to-Stringer
(page 14)

Stair Stringer-to-Deck Framing
(page 14)

Ledger Attachment
(page 7)

Joist-to-Ledger
(page 11)

Beam-to-Post
(page 12)

Footings
(page 8)

Joist-to-Beam
(page 12)

Post Bases
(page 9)

SELECTING CONNECTORS & FASTENERS

CORROSION ISSUES

When selecting hardware or fasteners for deck construction it is important to use connectors with a level of corrosion resistance appropriate to the application.

Outdoor environments are generally more corrosive to steel because connectors are exposed to the elements. If building a deck in an area especially prone to moisture, such as homes along the coast or near bodies of water, the risk of corrosion is much higher. In addition, the chemicals used in some preservative treated woods have been found to increase the corrosion of connectors and fasteners. Other corrosion risk factors include exposure to fire retardants, fumes, fertilizers, soil, industrial zones, acid rain, and other corrosive elements.

Depending on the deck materials and environmental conditions, Simpson's ZMAX® (G185) and hot dip galvanized (HDG) connectors and fasteners may provide adequate corrosion resistance. If you choose to use ZMAX or HDG on your deck project, you should periodically inspect your connectors and fasteners or have a professional inspection performed. Regular maintenance including water-proofing of the wood used to construct your deck is also a good practice. When using ZMAX/HDG connectors, you must use fasteners galvanized per ASTM A153.

For higher exposure applications, stainless steel connectors and fasteners offer the best defense against corrosion. Simpson offers a variety of connectors and fasteners for deck construction in stainless steel. Remember when using stainless steel connectors, you must also use stainless steel fasteners.

Use the chart below, which was created based on Simpson's testing and experience, to select the connector finish or material suitable for various types of preservative treated wood.

Low = Use Simpson standard painted and G90 galvanized connectors as a minimum.
 Med = Use ZMAX/HDG galvanized connectors as a minimum. Use fasteners galvanized per ASTM A153 or SDS screws with double-barrier coating.
 High = Use Type 303, 304, 305 or 316 Stainless Steel connectors and fasteners.

Environment	Unfinished Wood	SDS/DDS Zinc Borate	ACQ (Copper/Aluminum)			AZCA	Other or Uncertain
			None	With Ammonia	Higher Chemical Content		
Interior – Dry	Low	Low	Med ⁵	Med	High	High	High
Exterior – Dry	Low	N/A ²	Med	High	High	High	High
Exterior – Wet	Med	N/A ²	Med ^{3,4}	High	High	High	High
Higher Exposure	High	N/A ²	High	High	High	High	High
Uncertain	High	N/A ²	High	High	High	High	High

1. Woods with actual retention levels greater than 0.40 pcf for ACQ, 0.41 pcf for CBA-A, or 0.21 pcf for CA-B (Ground Contact level).
2. Borate treated woods are not appropriate for outdoor use.
3. Test results indicate that ZMAX/HDG and the SDS double-barrier coating will perform adequately, subject to regular maintenance and periodic inspection. However, the nationally-approved test method used, AWWPA E12-94, is an accelerated test, so data over an extended period of time is not available. If uncertain, use Stainless Steel.
4. Some treated wood may have excess surface chemicals making it potentially more corrosive. If you suspect this or are uncertain, use Stainless Steel.
5. Where noted in the table, applications where the wood is dry (moisture content less than 19%) when installed and will remain dry in-service may use a minimum coating recommendation of "Low".

For more information on corrosion and selecting the appropriate finish for your application visit www.strongtie.com/info.

COATINGS AVAILABLE

Not all products are available in all finishes. Contact Simpson for product availability, ordering information and lead times.

Finish	Description	Level of Corrosion Resistance
Gray Paint	Water-based paint intended to protect the product while it is warehoused and in transit to the jobsite.	Low
Powder Coating	Baked on paint finish that is more durable than our standard paint and produces a better looking finished product. Intended to protect the product while it is warehoused and in transit to the jobsite.	Low
Standard G90 Zinc Coating	Zinc galvanized finish containing 0.90 oz. of zinc per square foot of surface area (total both sides).	Low
ZMAX G185	Galvanized (G185) 1.85 oz. of zinc per square foot of surface area (hot-dip galvanized per ASTM A653 total both sides). These products require hot-dip galvanized fasteners (fasteners galvanized per ASTM A153).	Medium
HDG GALVANIZED	Products are hot-dip galvanized after fabrication (14 ga. and thicker). The coating weight increases with material thickness. The minimum specified coating weight is 2.0 oz./ft ² (per ASTM A123 total both sides). These products require hot-dip galvanized fasteners (fasteners galvanized per ASTM A153).	Medium
Double-Barrier Coating (SDS Screws)	SDS screws that are manufactured with two different finishes that provide a level of corrosion protection that exceeds that provided by the previous HDG finish.	Medium
303 STAINLESS STEEL	Products manufactured from Type 316L stainless steel, and provide greater durability against corrosion. Stainless steel nails are required with stainless steel products, and are available from Simpson.	High

EXISTING DECKS: RETROFIT OR REPLACE

DO I NEED TO RETROFIT?

5 THINGS TO LOOK FOR ON AN EXISTING DECK

When inspecting a deck to determine overall safety and compliance to building codes, look at the following five areas:

- 
Missing Connections: Any connections that do not meet the requirements discussed in this guide can compromise the safety of the deck. In many cases toenailing does not constitute a proper connection.
- 
Loose Connections: Depending on how the deck was built, vital connections may have degraded over time due to various factors. Issues such as wobbly railings, loose stairs and ledgers that appear to be pulling away from the adjacent structure are all causes for concern.
- 
Corrosion of Connectors and Fasteners: Metal connectors and fasteners can corrode over time, especially if a product with insufficient corrosion resistance was originally installed. See page 5 for more information on corrosion.
- 
Rot: Wood can rot and degrade over time with exposure to the elements. Members within the deck frame that have rotted may no longer be able to perform the function for which they were installed.
- 
Cracks: As wood ages it is common for cracks to develop. Large cracks or excessive cracking overall can weaken deck framing members.

RETROFITTING AN EXISTING DECK

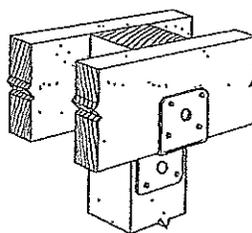
It is estimated that of the 40 million existing decks, only half are code-compliant. Experts believe that it is likely that many of these decks are potentially unsafe. In situations where it is not feasible to rebuild an existing deck, it may be preferable to retrofit it by applying hardware to existing framing members. Many of the products shown in this guide may be installed after deck framing is in place and can improve the safety of the structure and help bring it within the requirements of the code.

THE LIFE EXPECTANCY OF DECKS

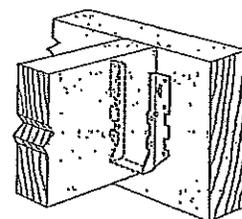
Most experts agree that the average life expectancy of a deck is 10 to 15 years. Since deck building started about 30 years ago, there are many existing decks that are past their useful life. Deck maintenance is often overlooked as well. Decks are exposed to the elements, which can cause damage. It's important that decks are properly inspected and maintained on a routine basis. If unsure, it's best to consult with a professional, such as a structural engineer or contractor, to make sure the deck is safe.

CONNECTOR SOLUTIONS FOR RETROFITTING

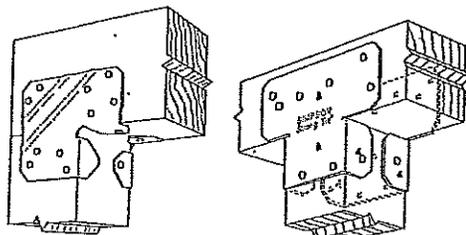
The following connectors are some of the products that may be suitable for deck retrofit. Selection of products based upon performance and/or suitability for a specific application should be made by a qualified professional. Simpson recommends that product choice be approved by the local building department before work begins.



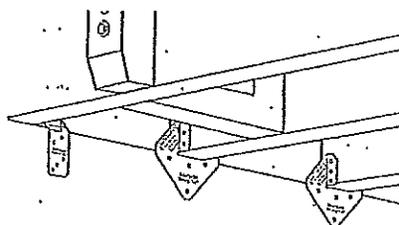
DJT14Z: Connects beams at the side of the post.



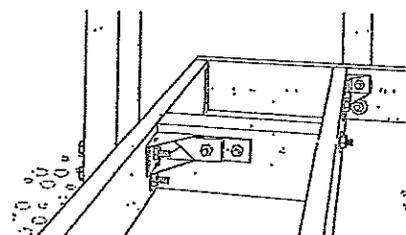
LUSZ Joist Hanger: Provides bearing and uplift resistance, features double-shear nailing for added strength.



LCEZ/ACZ Retrofit Post Caps: Two-piece cap may be installed before or after lumber is in place.



H1Z Hurricane Tie: Holds joist on both sides.



HD2AHDG Holdown: Horizontal application fastening railing post to deck framing.



LEDGER ATTACHMENT

Correct ledger attachment is crucial when building a deck that is attached to another structure. One of the most common causes for deck failure are ledgers that pull away from the primary structure, resulting in complete collapse.

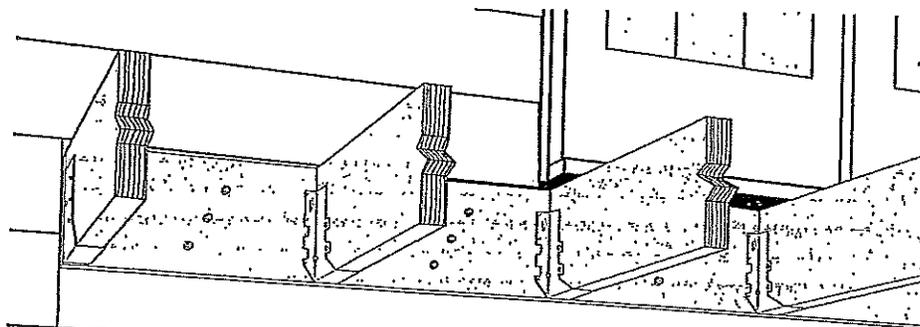
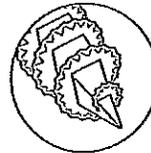
The two most common ways to correctly attach a ledger to a structure are lag screws or through-bolts through the ledger and into the rim joist of the supporting structure. The installation of through-bolts requires access to the back side of the rim joist which, in some cases, is not possible without significant removal of drywall within the structure.

SIMPSON SOLUTION

The Simpson Strong-Drive® screw (SDS) is a 1/4" diameter structural wood screw that is suitable for installing ledgers and meets the requirements of the building codes. It installs easily and does not require predrilling. The SDS screw is available with a hot-dip galvanized finish or the new double-barrier coating. Both finishes are suitable for outdoor and some preservative-treated wood applications (see page 5 for details). SDS screws with the zinc dichromate (gold color) finish are not recommended for outdoor applications or applications where they come in contact with preservative treated lumber.



Identification on all SDS screw heads



Ledger may not be installed over siding or stucco. It must be fastened directly to the rim joist or stud or through sheathing into an appropriate framing member.

DESIGN/INSTALLATION GUIDELINES

It is important that an engineer or other qualified professional evaluates the design of the deck to determine the specific number of fasteners and their spacing for any specific deck installation. The following installation requirements must be met in order for the Strong-Drive screw to achieve allowable load values published in Simpson's *Wood Construction Connectors* catalog:

1. Screws must be installed into a stud or rim board with sufficient thickness.
2. Screws can be installed over sheathing provided it is structural sheathing (OSB or plywood).
3. Rim board must be at least 1 1/2" thick or a reduction to the catalog loads is required.
4. When installed into a stud a minimum edge distance of 3/8" must be maintained.
5. Minimum of 3" long screws must be used (plus the thickness of any structural sheathing that remains in place).
6. Ledger may not be installed over siding or stucco, it must be fastened directly to the rim joist, stud, or sheathing.

Code Requirements

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 as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. – IRC 2006 Section R502.2.2 / IBC 2006 Section 1604.8.3

Selection of products based upon performance and/or suitability for a specific application should be made by a qualified professional. Simpson recommends that product choice be approved by the local building department before construction begins.

FOOTINGS



Code Requirements

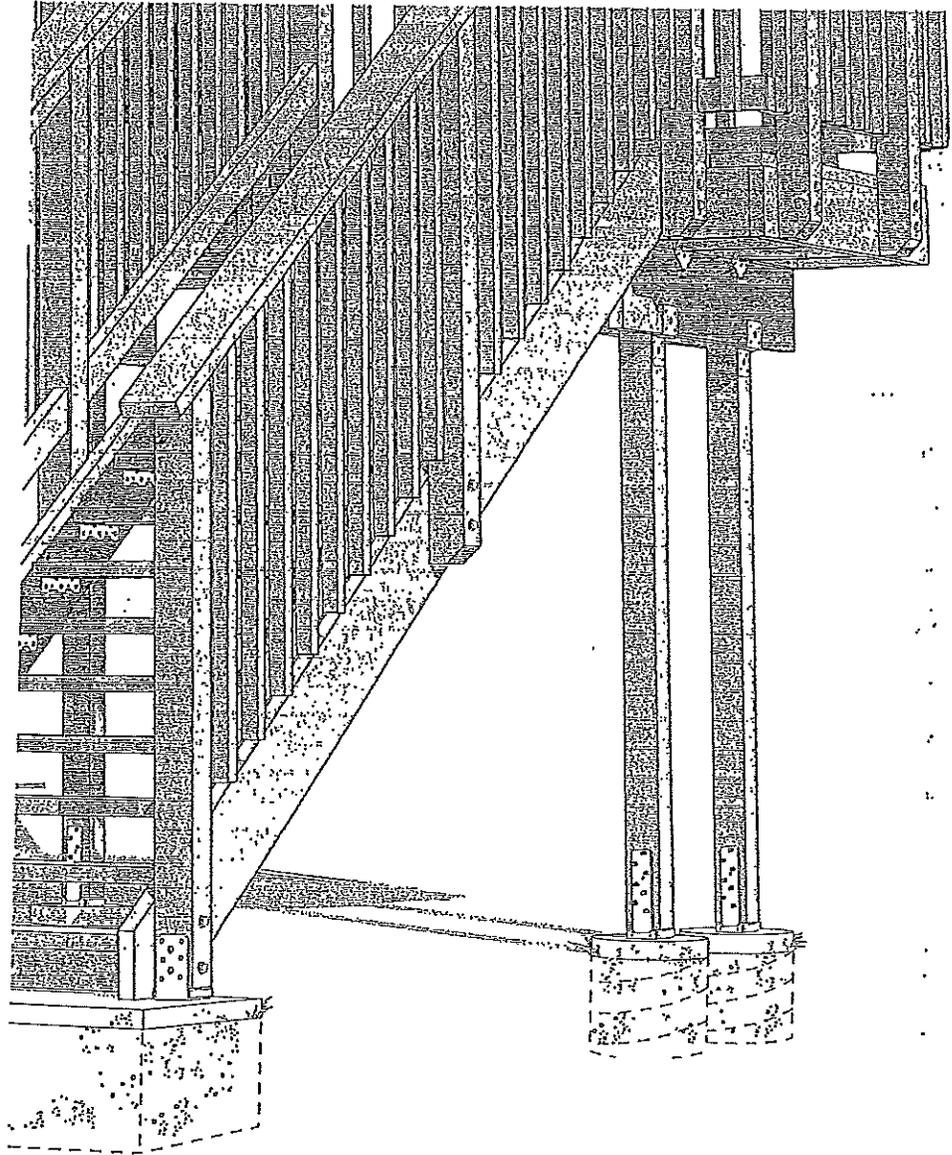
FOOTINGS

- ✓ The building codes include specific requirements regarding footing size that are dependent upon factors such as the dead and live loads the deck is designed to resist as well as soil conditions. Footing should be designed per *IRC 2006, Section R403* or *IBC 2006, Section 1805*

Minimum Footing Depths By Code (See the codes for actual footing size required.)

- ✓ Footings shall be at least 12" below the undisturbed ground surface. *IRC 2006, Section R403.1.4 / IBC 2006, Section 1805.2*
- ✓ Footings shall be designed so that the allowable bearing capacity of the soil is not exceeded. The minimum width of footings shall be 12 inches. *IRC 2006, Section R403.1.1 / IBC 2006, Section 1805.4.1*

In order for posts to properly resist various types of loads they must rest on, and be anchored to, concrete footings. Patios and pre-cast concrete plers do not qualify as proper footings for deck construction.



Note: In order to achieve published load values, footings must provide sufficient concrete cover of the embedded portion of Simpson cast-in-place post and column bases. In some cases a footing larger than the minimum required by the building codes will be necessary to meet these requirements. See Simpson's *Wood Construction Connectors* catalog for more information.

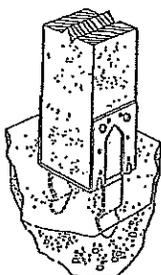
POST BASES

Posts must be correctly attached to a concrete footing in order to resist lateral and uplift loads. Unless they are naturally decay-resistant or preservative-treated wood, they must also be elevated off the concrete by 1" to help prevent decay at the end of the post due to moisture.

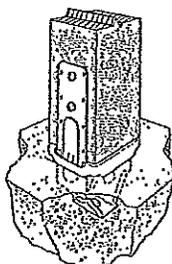
SIMPSON SOLUTIONS

Cast-in-place

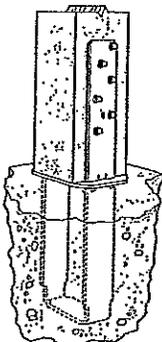
These products are cast into the concrete at the time of the pour.



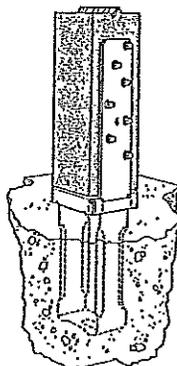
PBZ Post Base: For use with decay resistant or preservative treated wood.



PBSZ Post Base with Standoff: Features a 1" standoff.



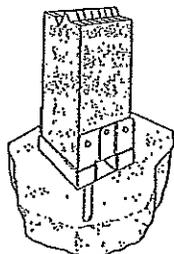
CBQZ Column Base: Installs with SDS wood screws.



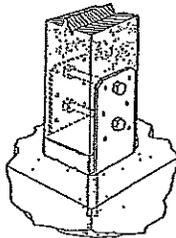
CBSQZ Column Base: Installs with SDS wood screws and features a 1" standoff.

Post-Installed

These products utilize anchor bolts installed during the pour or after the concrete hardens.



ABA Adjustable Post Base with Standoff: Offers adjustability to account for imperfect bolt placement as well as a 1" standoff.



ABU Adjustable Post Base with Standoff: Offers adjustability, a 1" standoff and increased uplift loads.

Code Requirements

Load Resistance

- ✓ Columns shall be restrained to prevent lateral displacement at the bottom end. Wood columns shall not be less in nominal size than 4" x 4" – *IRC 2006, Section R407.3*
- ✓ Column and post-end connections shall be fastened to resist lateral and net induced uplift forces – *IBC 2006, Section 2304.9.7*

Decay Resistance of Post

- ✓ Wood columns shall be of an approved wood with natural decay resistance or approved preservative-treated wood. Exception: Columns exposed to the weather that are supported by a metal pedestal projecting 1" above the concrete and 6" above exposed earth – *IRC 2006, Section R319.1 / IBC 2006, Section 2304.11*

Selection of products based upon performance and/or suitability for a specific application should be made by a qualified professional. Simpson recommends that product choice be approved by the local building department before construction begins.



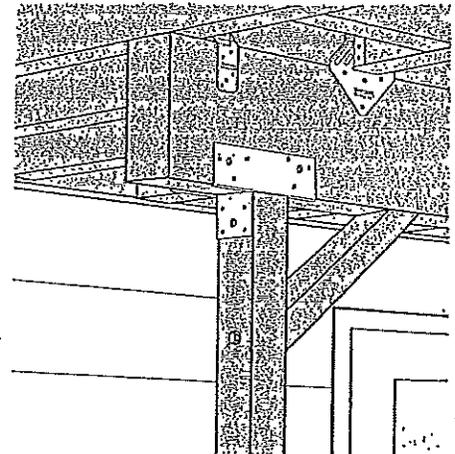
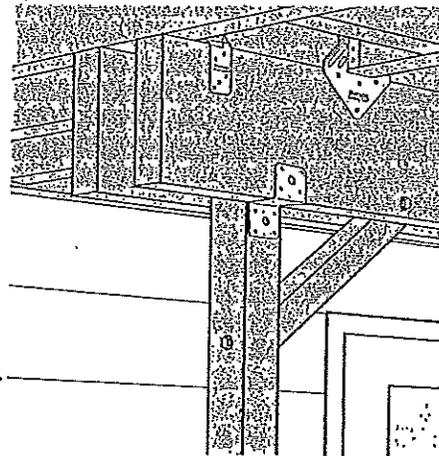
These products are available with a ZMAX® or hot-dipped galvanized finish. Stainless steel connectors are also available for higher exposure environments or applications using certain preservative treated woods. See page 5 for more details.

BEAM-TO-POST CONNECTIONS

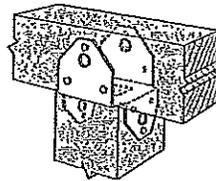
Code Requirements

- Where posts and beam or girder construction is used to support floor framing, positive connections shall be provided to ensure against uplift and lateral displacement – *IRC 2006, Section R502.9 / IBC 2006, Section 2304.9.7*

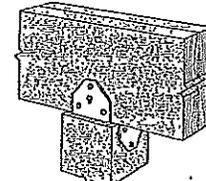
At the point where a beam meets a post, it must be properly connected to the post in order to resist gravity, lateral and uplift loads. This pertains to solid sawn beams or those comprised of multiple members, whether they rest on top or are fastened to the side of the post.



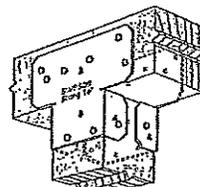
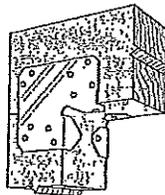
SIMPSON SOLUTIONS



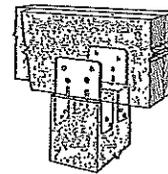
BCZ Post Cap: For single-member solid sawn beams.



BCSZ Post Cap: Connects double 2x's to a 4x post or triple 2x's to a 6x post.



LCEZ/ACZ Retrofit Post Caps: Two-piece cap may be installed before or after lumber is in place when the sides of the post and beam are flush.

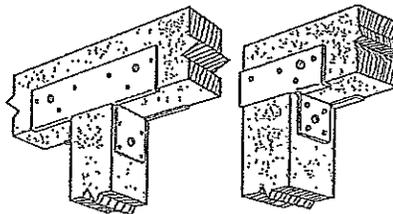


LPCZ Post Cap: Two-piece cap adjusts for beams smaller than post width.

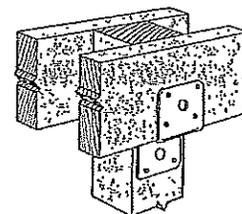
Selection of products based upon performance and/or suitability for a specific application should be made by a qualified professional. Simpson recommends that product choice be approved by the local building department before construction begins.



These products are available with a ZMAX® or hot-dipped galvanized finish. Stainless steel connectors are also available for higher exposure environments or applications using certain preservative treated woods. See page 5 for more details.



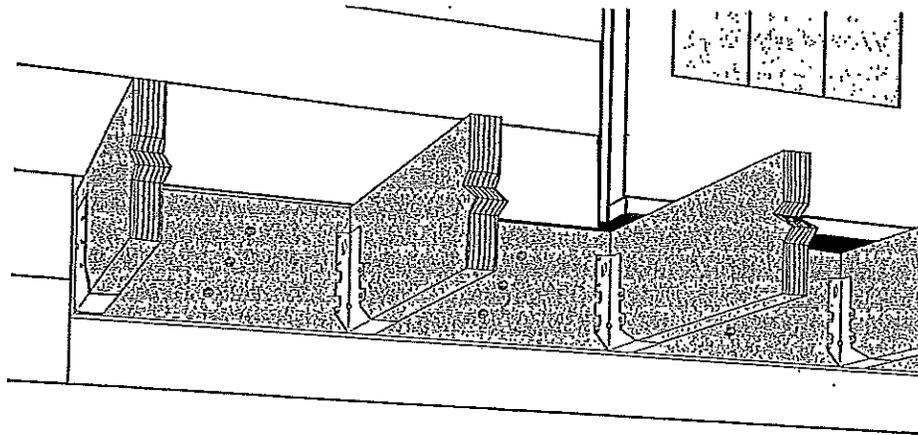
PCZ/EPCZ Post Caps: Connects beams at the top of the post.



DJT14Z: Connects beams at the side of the post.

JOISTS TERMINATING INTO BEAM / LEDGER

When joists terminate into a beam or ledger, a connection is required to provide bearing. In cantilever applications the connection must also resist uplift.



Code Requirements

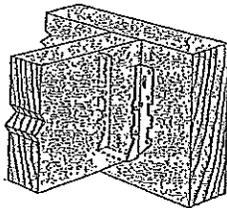
Bearing

- ✓ The ends of each joist, beam or girder shall have at least 1½" of bearing on wood or metal except where supported on a 1" x 4" ribbon strip nailed to adjacent studs. – IRC 2006, Section R502.6 / IBC 2006, Section 2308.8.1
- ✓ Joists framing into the side of a wood beam shall be supported by approved framing anchors or on ledger strips not smaller than 2" x 2" – IRC 2006, Section 502.6.2 / IBC 2006, Section 2308.8.2

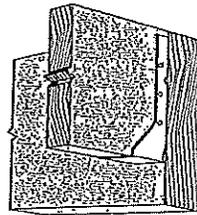
Cantilevered Applications

- ✓ 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 acting on the cantilevered portion of the deck. – IRC 2006, Section 502.2.2 / IBC 2006, Section 1604.8.3

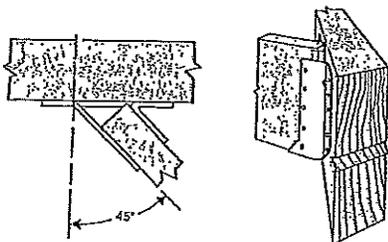
SIMPSON SOLUTIONS



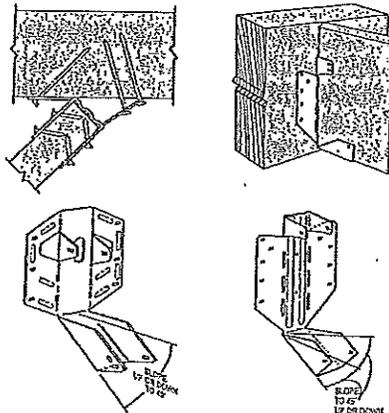
LUSZ Joist Hanger: Provides bearing and uplift resistance, features double-shear nailing for added strength.



LUCZ Concealed Flange Joist Hanger: Provides bearing and uplift resistance, concealed flanges for cleaner look and for end conditions.



SURZ/SULZ Skewed Joist Hanger: 45° skewed hanger (available in skewed right and left versions), provides bearing and uplift resistance.



LSU26Z/LSSU210Z Field Skewable Joist Hanger: Field skewable right or left up to 45°, provides bearing and uplift resistance. Also field slopeable up or down to 45°.

Selection of products based upon performance and/or suitability for a specific application should be made by a qualified professional. Simpson recommends that product choice be approved by the local building department before construction begins.



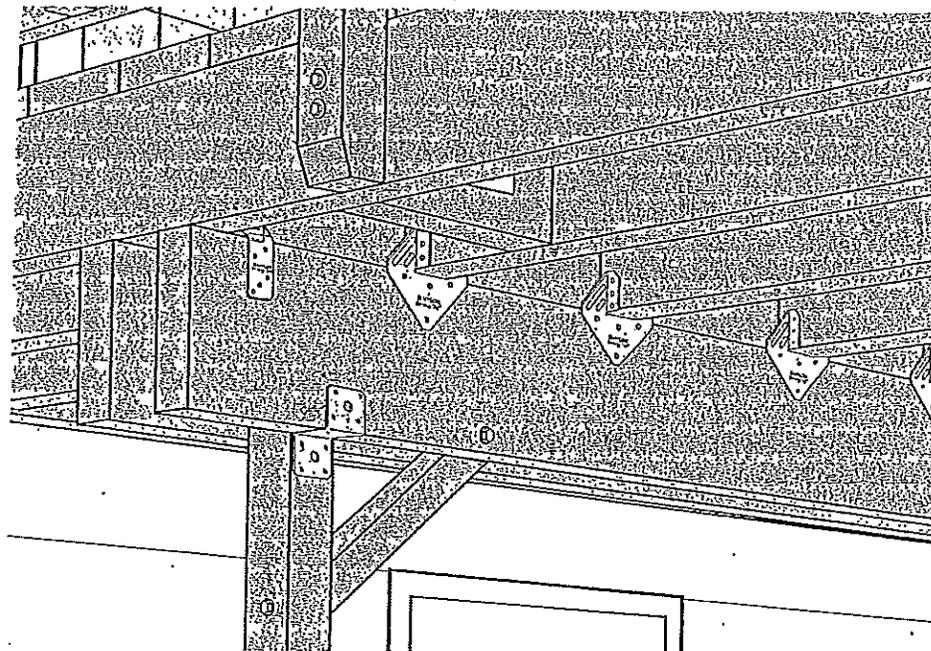
These products are available with a ZMAX® or hot-dipped galvanized finish. Stainless steel connectors are also available for higher exposure environments or applications using certain preservative treated woods. See page 5 for more details.

JOISTS BEARING ON A BEAM

Code Requirements

- ✓ Where posts and beam or girder construction is used to support floor framing, positive connections shall be provided to ensure against uplift and lateral displacement – *IRC 2006, Section R502.9 / IBC 2006, Section 2304.9.7*
- ✓ Joists must be supported laterally at the ends by solid blocking or attachment to a full depth header, band or rim joist (IRC & IBC). Lateral restraint must be provided at each support (IRC only) – *IRC 2006 Section R502.7 / IBC 2006 Section 2308.8.2*

At the point where the joist bears on top of a beam, there must be a connection to resist lateral and uplift forces. Blocking or framing is also required to prevent overturning of the joists.

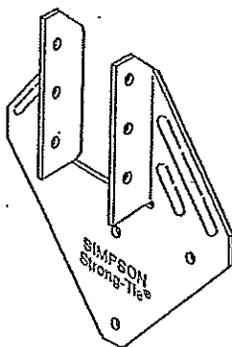


SIMPSON SOLUTIONS

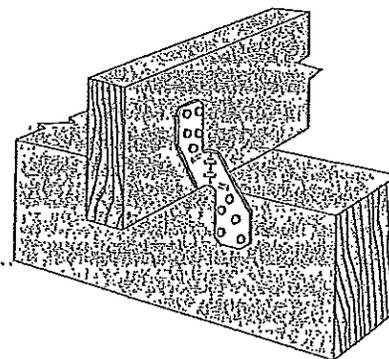
Selection of products based upon performance and/or suitability for a specific application should be made by a qualified professional. Simpson recommends that product choice be approved by the local building department before construction begins.



These products are available with a ZMAX® or hot-dipped galvanized finish. Stainless steel connectors are also available for higher exposure environments or applications using certain preservative treated woods. See page 5 for more details.



H1Z Hurricane Tie: Holds joist on both sides.

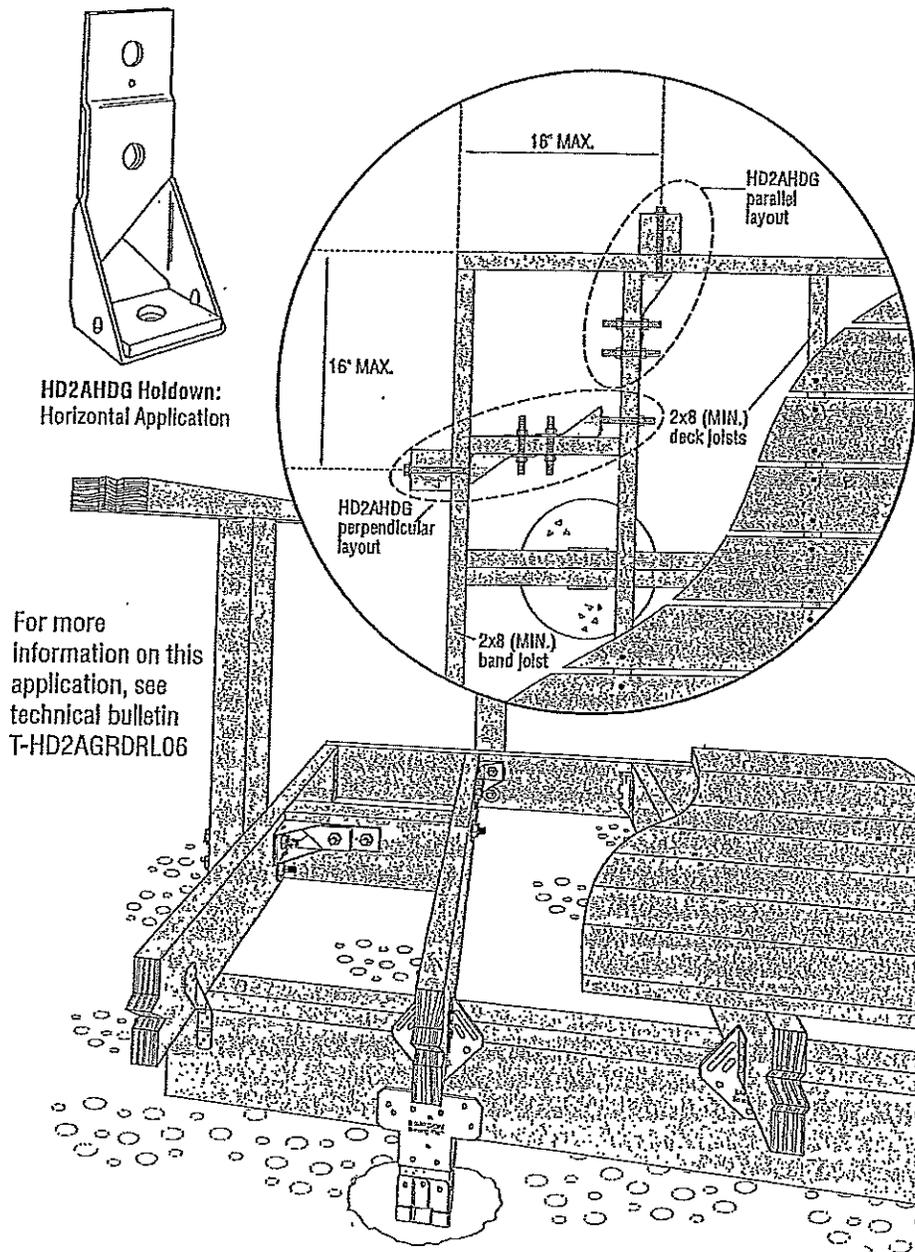


H2.5AZ Hurricane Tie: Suitable for single-sided applications.

RAILING POST-TO-DECK FRAMING

The railing connection is one of the more crucial connections pertaining to safety, and it is often inadequately constructed. In order to provide the required load resistance at the hand rail, the post must not only be fastened to the rim joist, but also tied back into the joist framing. Machine bolts through the post and rim joist alone do not typically meet the performance requirements of the code. The details shown below have been shown through testing to resist the forces called out by the codes.

SIMPSON SOLUTION



Code Requirements

When required

- ✓ Guards shall be located along open-sided walking surfaces, porches, balconies or raised floor surfaces more than 30" above the floor or grade below.
 - IRC 2006, Section R312.1 / IBC 2006, Section 1013.1

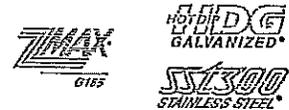
Height

- ✓ Guards shall be a minimum of 36" tall (IRC) or 42" tall (IBC)
 - IRC 2006, Section R312.1 / IBC 2006, Section 1013.2

Load Resistance

- ✓ Handrail assemblies and guards shall be able to resist a single concentrated load of 200 pounds, applied in any direction at any point along the top (IRC & IBC), and have attachment devices and supporting structure to transfer this loading to appropriate structural elements of the building (IBC only). - IRC 2006, Table R301.5 / IBC 2006, Section 1607.7.1

Selection of products based upon performance and/or suitability for a specific application should be made by a qualified professional. Simpson recommends that product choice be approved by the local building department before construction begins.



These products are available with a ZMAX® or hot-dipped galvanized finish. Stainless steel connectors are also available for higher exposure environments or applications using certain preservative treated woods. See page 5 for more details.

STAIR STRINGERS & TREADS



Code Requirements

Stair Stringer to Rim Joist

- ✓ Staircases must be able to resist 40 pounds per square foot of tread area. – IRC 2006, Table R301.5 / IBC 2006, Table 1607.1. (1 and 2 family dwellings)

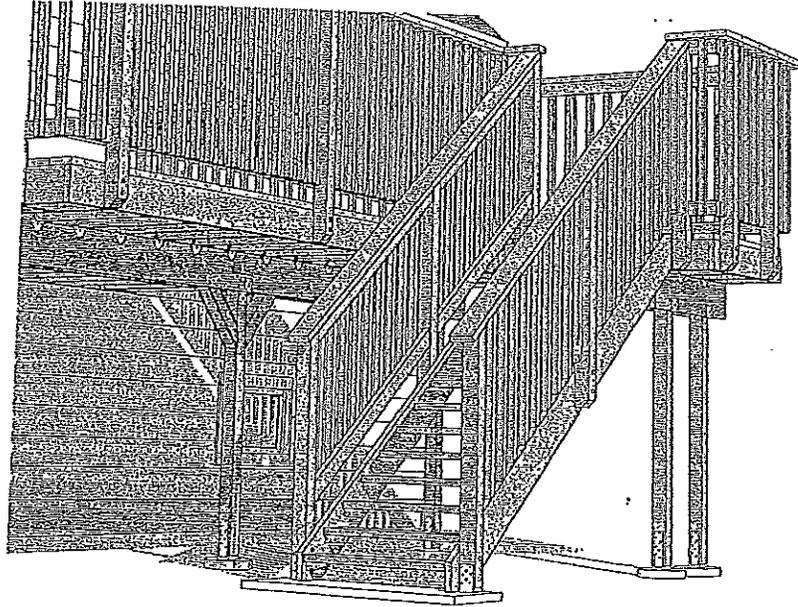
Stair Tread to Stringer

- ✓ Individual stair treads shall be able to resist a 300 lb. concentrated load acting over an area of 4 square inches. – IRC 2006, Table R301.5 / IBC 2006, Table 1607.1. (1 and 2 family dwellings)

Railing to Stringer Opening:

- ✓ The triangular openings formed by the riser, tread and bottom rail of the guard at the open side of a stairway shall be of a maximum size so as not to allow a sphere 6" in diameter to pass through. – IRC 2006 Section R312.2 / IBC 2006 Section 1013.3

Stair stringers must be properly connected to the deck, and treads properly connected to the stringers, in order to resist loads. In addition, code requirements regarding openings between stair treads and stair railing must also be met.

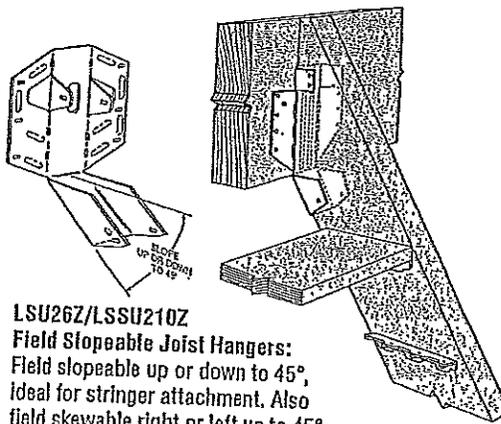


SIMPSON SOLUTIONS

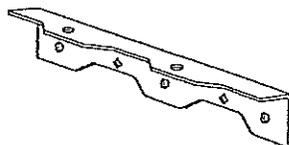
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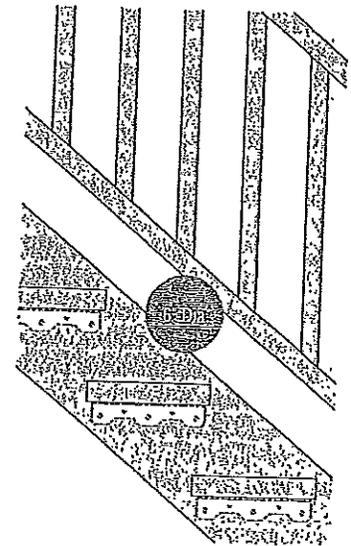
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LSU26Z/LSSU210Z
Field Slopeable Joist Hangers:
Field slopeable up or down to 45°, ideal for stringer attachment. Also field skewable right or left up to 45°.



TAZ Staircase Angle: Provides a positive connection, eliminating the need to notch the stringer. A full-width stringer is stronger and makes it easier to meet maximum guardrail opening requirements of the codes.

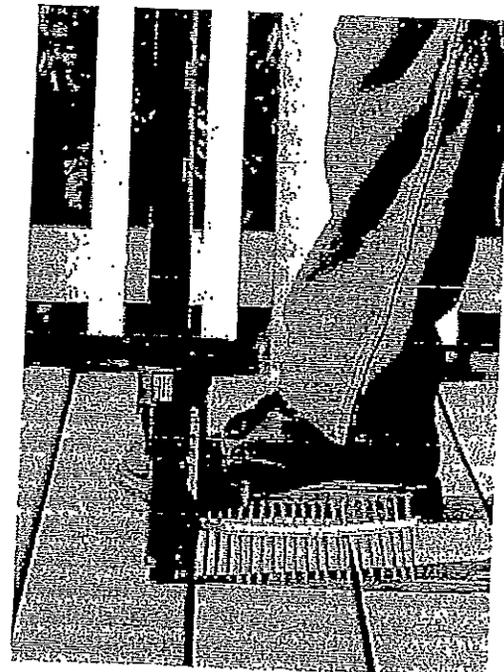


Codes require that a 6" sphere must not be able to pass between the stair stringer and the bottom rail of the hand rail. Using the TAZ makes it easier to meet these requirements.

FASTENING DECK BOARDS

QUIK DRIVE® AUTO-FEED SCREW FASTENING SYSTEM

Reduce installation time with a reliable way to secure deck boards. Screws are widely considered to be the best way to fasten decking material due to the holding power of the threads. Nails typically pull out over time, leaving the head protruding above the decking. In addition, many manufacturers of composite decking material recommend screws to fasten their products. Quik Drive offers a full range of collated screws for use with a wide variety of decking materials.

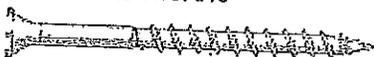


SCREWS FOR FASTENING DECKING

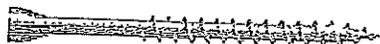
WSNTLG SERIES
N2000® Finish



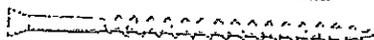
SS3DSCB SERIES
305 Stainless Steel #10



DTHQ SERIES
Trim Head, Quik Guard® Finish



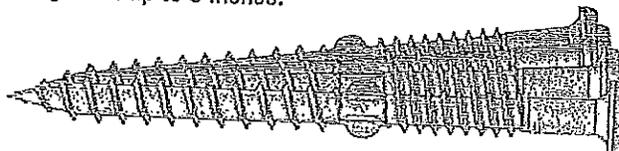
SSDTH SERIES
305 Stainless Steel, #8 Trim Head



A NEW SCREW FOR FASTENING COMPOSITE DECKING

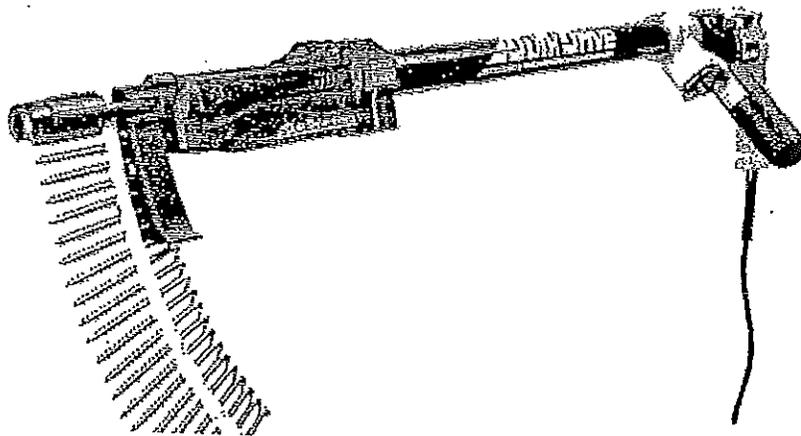
Simpson's new Quik Drive Compositi-Lok™ deck screw is specially designed for composite decking. The screw's shaft features unique counter-boring "wings" that create a channel for the excess composite material. This reduces upward pressure on the screw and prevents the common problem of "spin out" in cold or wet conditions. The cap style head also captures any mushrooming material, keeping it out of sight and ensuring a clean look. Compositi-Lok's Quik Guard coating allows the screw to be used with some preservative-treated

wood substrates (see www.strongtie.com/info for recommendations). Compositi-Lok Deck Screws are available in gray, tan, red and brown to match a variety of popular composite decking colors. Quik Drive screws are sold in lengths of up to 3 inches.

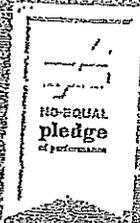


FASTEN DECKS FASTER WITH QUIK DRIVE

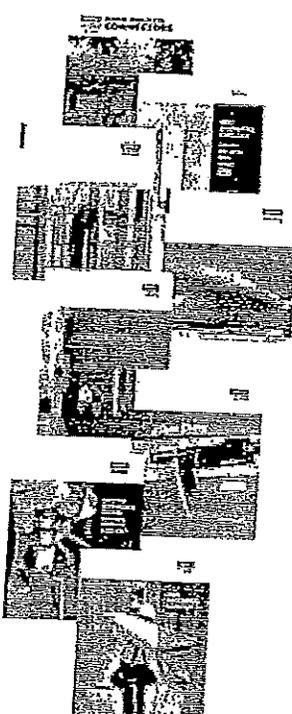
Quik Drive auto-feed screw driving systems provide the performance benefits of screws along with a fast and efficient installation method. The stand-up and drive systems are ideal for high volume deck applications where maximum efficiency is essential. With easy-loading screw strips, precise countersink adjustment and patented auto-advance mechanism, Quik Drive can save deck builders and contractors hours on jobsites.



For more information, request the Quik Drive Auto Feed Screw Systems catalog or visit www.strongtie.com/products/quikdrive.



Every day we work hard to enter new markets, develop new products and services with the quality, reliability and service to exceed your expectations. This is our pledge to you.



Wood Construction Connectors

Includes specifications and installation instructions on wood-to-wood and wood-to-concrete structural connectors. Includes load tables and material specifications.

Anchoring and Fastening Systems for Concrete and Masonry*

Includes application information, specifications and load values for adhesive and mechanical anchors, PAT and carbide drill bits. A binder version is also available.

*Available in English and Spanish versions.

Quik Drive® Catalog

A complete line of labor-saving auto-feed systems and specialty fasteners for a wide range of commercial and residential construction applications.

*Available in English and Spanish versions.

Stainless Steel Connectors

Simpson's collection of stainless steel structural connectors and fasteners for decks and other exterior applications.

High Wind Framing Connection Guide

Developed for designers and engineers as a companion to the AF&PA Wood Frame Construction Manual.

Code Compliant Repair and Protection Guide

Developed for building professionals to help explain products and techniques related to the installation of utilities in wood frame construction.

Canadian Limit States Design Catalog

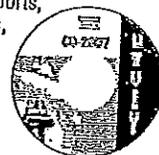
Specifications, loads and fasteners information provided in metric and imperial.

Do-It-Yourself Connectors Catalog

Suitable for a wide range of capabilities, this catalog includes ideas for home projects. This catalog includes connectors for Decks, Patio Covers, Fences and Garage Organization.

Simpson's Free CD-ROM

Our CD-ROM features our latest catalogs, filers, technical bulletins, code reports, product list prices, UPC information. It also includes the Drawing Library.



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Tel: 404.487.1300

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1000 North Dearborn Street
Chicago, IL 60610
Tel: 773.399.1300

Denver, CO
Simpson Strong-Tie Company
1000 North Dearborn Street
Denver, CO 80202
Tel: 303.733.1300

Houston, TX
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Tel: 281.444.1300

Los Angeles, CA
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1000 North Dearborn Street
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Simpson Strong-Tie Company
1000 North Dearborn Street
Portland, OR 97201
Tel: 503.224.1300

San Francisco, CA
Simpson Strong-Tie Company
1000 North Dearborn Street
San Francisco, CA 94101
Tel: 415.224.1300

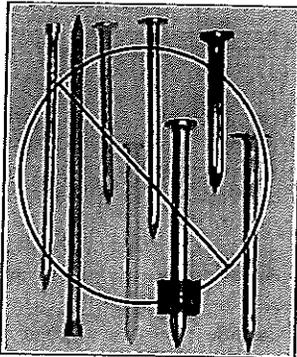
Seattle, WA
Simpson Strong-Tie Company
1000 North Dearborn Street
Seattle, WA 98101
Tel: 206.224.1300

Wichita, KS
Simpson Strong-Tie Company
1000 North Dearborn Street
Wichita, KS 67201
Tel: 316.224.1300

Code Requirements: Deck Construction

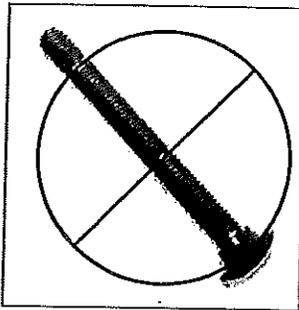
Fasteners

Not Acceptable



- Undersized Nails;
 - Finishing Nails
 - 4d/6d common
 - Siding Nails
- Roofing Nails
- Powder-actuated fasteners should not be used to install with connectors.

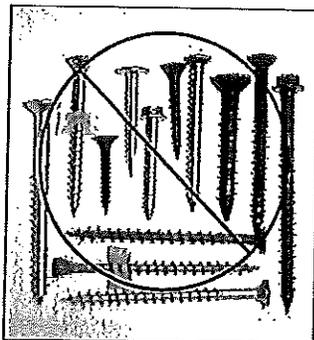
Not Acceptable



- Carriage Bolts are not recognized by the NDS for structural applications. AF&PA National Design Specification for Wood Construction Manual references;
 - ANSI B18.2.1 – Bolts and lag screws,
 - ANSI B18.6.1 – Wood Screws
 - ANSI B18.5 – Is for carriage bolts.

The specification for carriage bolts is not referenced in the NDS. And, since it is not referenced, the performance (load) for carriage bolts in wood applications is not available. Therefore, it is not an acceptable fastener for wood-to-wood structural application for a deck.

Not Acceptable



- Most wood screws are NOT acceptable due to low shear capacity and/or corrosion issues.
- Concrete & Masonry screws are NOT acceptable for exterior applications.