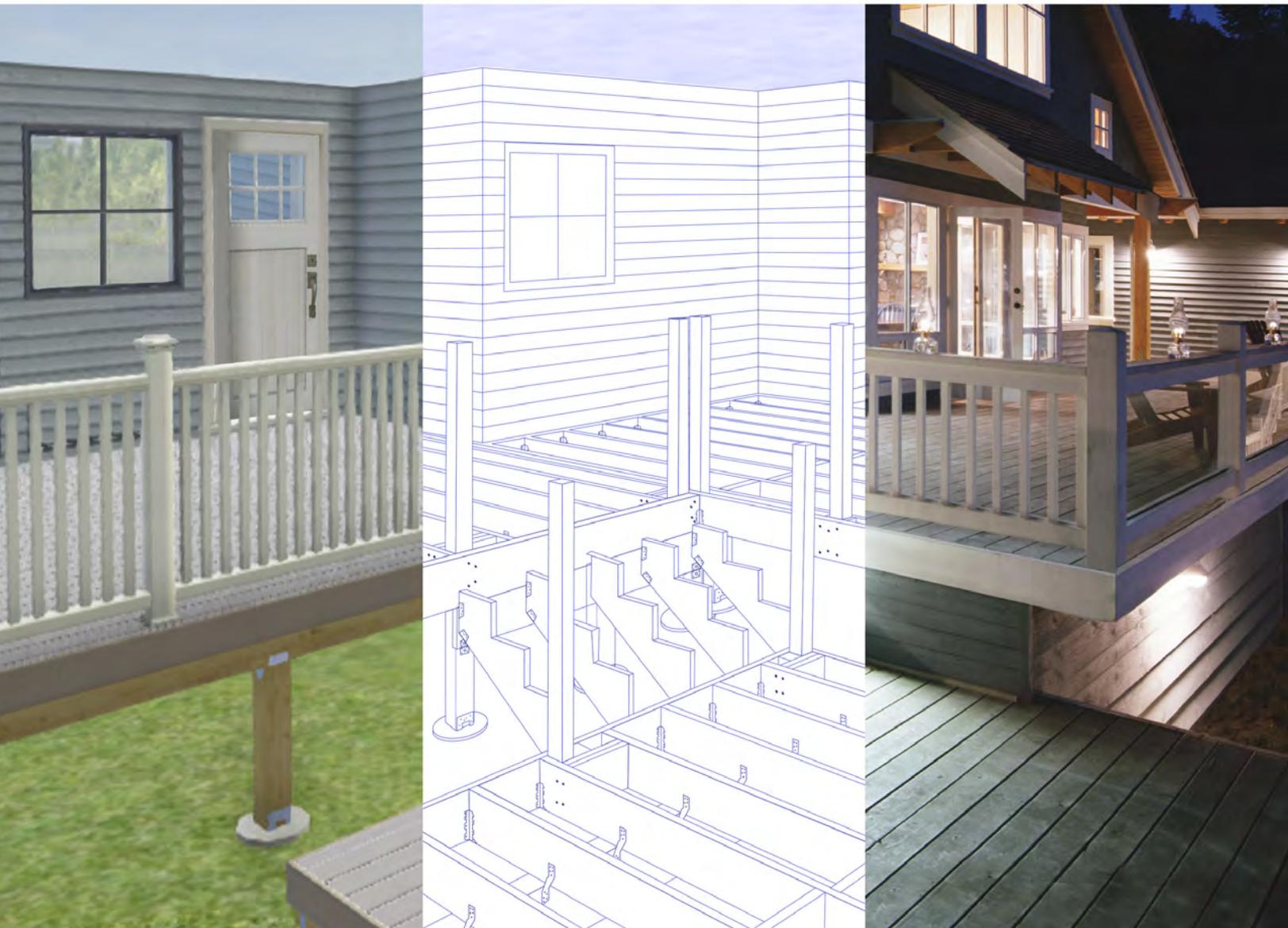


## Deck Connection and Fastening Guide



RECOMMENDATIONS FOR THE CONSTRUCTION OF BUILDING CODE-COMPLIANT DECKS

# Contents

<b>Build a Safe, Strong Deck</b> . . . . .	<b>3</b>	<b>Performance Fasteners for Decks</b> . . . . .	<b>36</b>
Introduction . . . . .	4–5	Structural Wood Fastening . . . . .	37
Code Concerns . . . . .	6–7	Corrosion-Resistant Fasteners for Decking . . . . .	38–39
Critical Deck Connections Checklist . . . . .	8–9	Quik Drive® Auto-Feed Screw Driving Systems for Decks . . . . .	40
Existing Decks: Retrofit or Replace? . . . . .	10–11	Color-Match Fasteners for Composite and PVC Decking . . . . .	41
<b>Help for Your Deck Planning</b> . . . . .	<b>12</b>	Hidden Deck Fastening . . . . .	42
Deck Planner Software™ . . . . .	13	<b>Fastener Selection Guidance</b> . . . . .	<b>43</b>
Fastener Software . . . . .	14	Matching Connectors and Fasteners . . . . .	44
<b>Deck Solutions That Meet Code</b> . . . . .	<b>15</b>	Connector Fastener Types . . . . .	45
Footings . . . . .	16	Fastener Information . . . . .	46
Post Bases Installed on Existing Concrete . . . . .	17–19	<b>Mitigating Corrosion Risk</b> . . . . .	<b>47</b>
Beam-to-Post Assemblies and Connections . . . . .	20–21	Selecting Connector and Fastener Coatings . . . . .	48
Ledger Connections . . . . .	22–25	Corrosion Information . . . . .	49–50
Joists Terminating into Beam/Ledger . . . . .	26–27		
Joists Bearing on a Beam . . . . .	28		
Guard Post to Deck Framing . . . . .	29–32		
Guardrail Infill Component Connections . . . . .	33–34		
Stair Stringers and Treads . . . . .	35		

## Visit the Deck Center at [strongtie.com/deckcenter](http://strongtie.com/deckcenter)

### Everything You Need in One Place

We have brought all of our information and training on building stronger, safer decks together in one location to make learning easier than ever.

### A Word About Building Codes

This guide recommends connectors and fasteners for deck construction that may meet the requirements of the 2015/2018 International Building Code® and the 2015/2018 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.

### Product Approvals

**Selection of products based upon performance and/or suitability for a specific application should be made by a qualified professional.** Simpson Strong-Tie recommends that deck designs 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

For information regarding the Simpson Strong-Tie Limited Warranty, see [strongtie.com/limited-warranties](http://strongtie.com/limited-warranties) or call (800) 999-5099.

### Resources to Make Building Easier

- Deck Planner Application, [strongtie.com/deckplanner](http://strongtie.com/deckplanner) — deck design software
- Fastener Finder Application, [strongtie.com/ff](http://strongtie.com/ff) — fastener identification software
- Fastener Designer Application, [strongtie.com](http://strongtie.com) — fastener load and application mapping software
- "Deck Inspection for New and Existing Construction", [strongtie.com/training](http://strongtie.com/training) — Simpson Strong-Tie deck training course
- NADRA Deck Evaluation Checklist, [nadra.org/deck-safety](http://nadra.org/deck-safety)

# Build a Safe, Strong Deck

# Introduction

## Build a Safe, Strong Deck

A beautiful deck is about more than wood, fasteners and connectors. It's about the experiences and connections that happen between people while they are enjoying their time outside. Outdoor living can enhance our enjoyment of life immeasurably, and a well-built deck can make an important contribution to that aspect of our lifestyle. Simpson Strong-Tie believes that a beautiful deck must also be safe and strong.



## Deck Construction and Fastening Tips

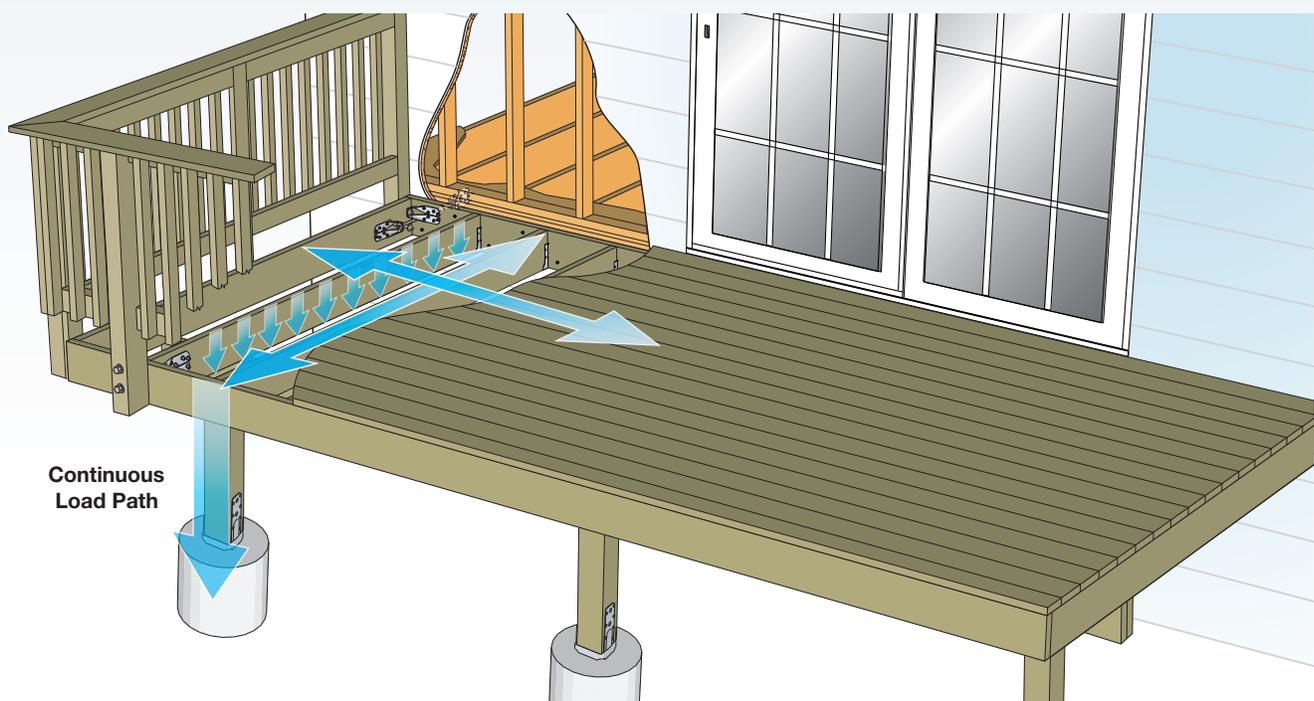
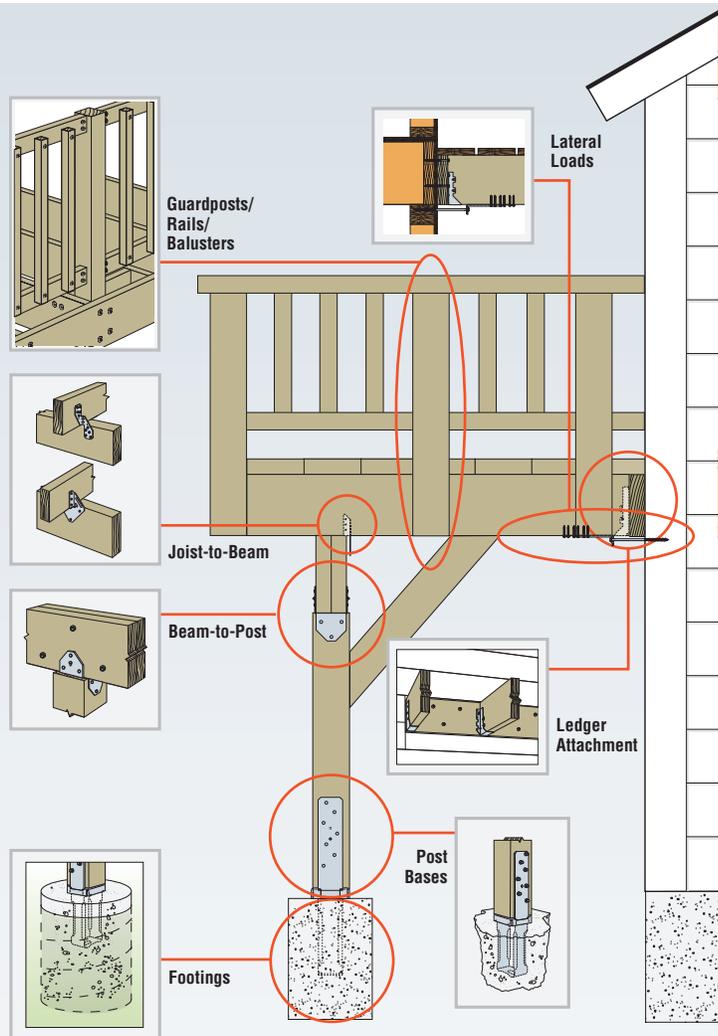
- Before beginning construction, allow your decking materials to acclimate to the jobsite conditions. A freshly pressure treated deck board can contain over a gallon of liquid.
- Select the proper fastener based on the importance of the connection, exposure, and the materials that are being fastened. Consult pp. 44–46 and pp. 48–50 of this catalog or [strongtie.com](http://strongtie.com) for guidelines on choosing the correct fastener.
- Consider using 300 Series stainless-steel fasteners when elevated exposure conditions may exist, such as presence of de-icing salts or close proximity to swimming pools, hot tubs, sprinklers, ponds, foliage and other moisture sources. For composite decking, follow manufacturer's fastening requirements.
- Inadequate gap spacing between boards can put additional load on the fasteners and lead to broken screws or nail pops. For deck board spacing recommendations, refer to the board manufacturer. Spacing for wood decks depends on wood species and moisture content; for composites, consult manufacturer installation instructions.
- Use caution to avoid overdriving fasteners during installation. Overdriving can cause fastener breakage and create a counterbore where water can pool, facilitating corrosion and decay.
- Allow for proper water drainage. A deck should angle away from the structure a minimum of 1/8" for every 8' to reduce the possibility of standing water.
- If 5/4" decking is to be installed diagonally, reduce the on-center joist spacing to 12" as opposed to the standard 16".
- Adequate ventilation is necessary to minimize cupping, warping and other weathering related defects. Construct the deck a minimum of 18" off the ground to allow proper airflow. If this is not possible, reduce on-center joist spacing to 12" as opposed to the standard 16". A moisture barrier (landscape fabric) under the deck, covered with gravel is also a good practice.
- Proper maintenance is essential. Staining and sealing, along with periodic inspection of fasteners and hardware, will potentially add years to the life of the deck
- Please refer to the American Wood Council's Prescriptive Residential Wood Deck Construction Guide (DCA 6) for important information on best practices and code compliant design.

# Introduction

## Continuous Load Path

As with your home, your deck should be built using a “continuous load path.” The continuous load path is an engineering concept that, when constructed, assures loads are completely transferred from point of application to the foundation via the structural components and connections. The load path or forces from gravity (vertical), lateral (horizontal) and uplift loads effectively transfer the weight (load) from the deck through its frame and then to the foundation and the adjacent support structure (typically your home). If your deck is built with a continuous load path, it will be better equipped to resist forces, such as occupancy, wind, snow and earthquakes. Visit [strongtie.com/deckcenter](http://strongtie.com/deckcenter) to learn more about achieving a continuous load path in the construction of your deck.

**A safe deck is built with fasteners and connectors that create a continuous load path.**



## Code Concerns

### Do Decks Really Need to Meet Building Code Requirements?

Because decks may look relatively simple to build, many people do not realize that they are structures that need to be designed to meet minimum standards and resist certain loads. Like a house, or any other building, a deck must be designed to support the weight of people and objects placed on it, as well as lateral and uplift loads that can act on the deck as a result of occupant movement, wind or seismic activity. The 2015/2018 versions of both the IBC and IRC contain language outlining the general design requirements of structures. This excerpt from the 2015/2018 IRC (Section R301.1) 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 the requirements for the transfer of loads from their point of origin through the load-resisting elements to the foundation.”

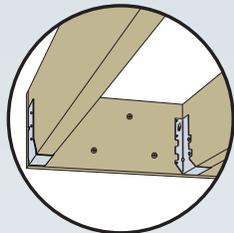
The concept of a complete or continuous load path refers to a series of solid connections and structural members within the deck that transfer load to the ground or adjacent supporting structure (commonly a building). This same principle is applied to the design of all types of wood-frame buildings.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



# Code Concerns

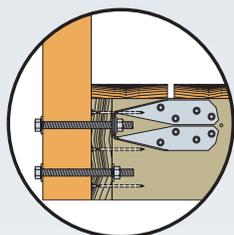
## Common Building Code Violations

The following code requirements can be easily overlooked in deck construction:



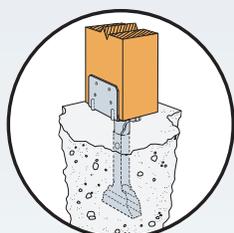
### 1. Proper fastening of the ledger connection

IRC and IBC code prohibits the “use of toenails or nails subject to withdrawal” when making ledger connections, yet a number of deck failures each year result due to using these or other types of improper fasteners. For more information, see p. 22.



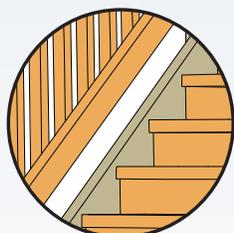
### 2. Proper fastening of guard posts to the deck

IRC and IBC code requires the guard post to resist a 200-pound design load. This load, applied at the top of the guard post, creates a large leverage force where the guard post attaches to the deck framing. For more information, see p. 30.



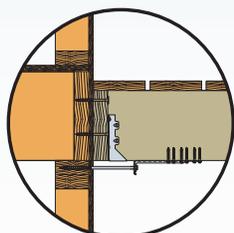
### 3. Post-base connections

IRC and IBC code requires posts “be restrained to prevent lateral displacement at the bottom end.” This requirement is important because most decks cannot safely support part or all of their load if a post base can move. For more information, see pp. 17-19.



### 4. Openings in guards and stair railings

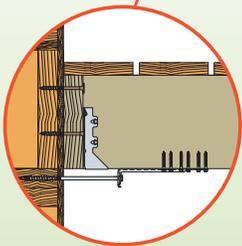
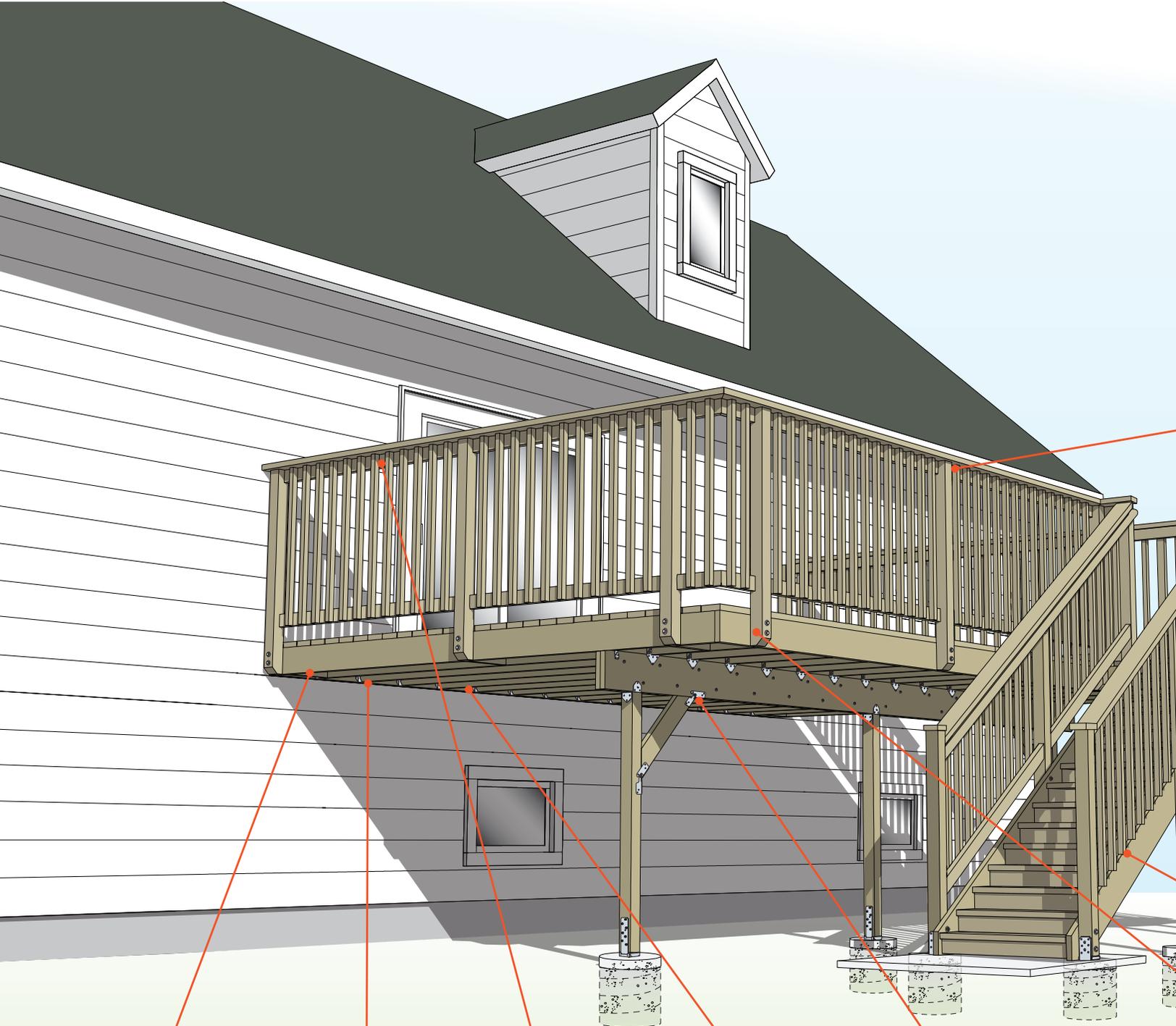
IRC and IBC code places a limit on the size of openings, for the occupants’ safety in case of tripping or falling, and for the safety of small children. For more information, see p. 35.



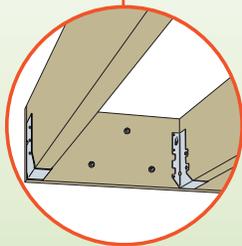
### 5. Lateral load solutions

IRC and IBC code requires that a deck be designed for both the vertical and lateral loads. Although there is some lateral movement with wind and seismic events, deck failures occur when people move around on a deck and create that lateral movement causing the deck to pull away from the primary structure before collapsing. For more information, see p. 25.

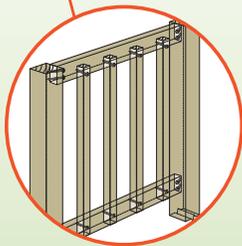
# Critical Deck Connections Checklist



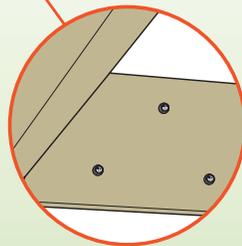
**Lateral-Load Connection**  
(p. 25)



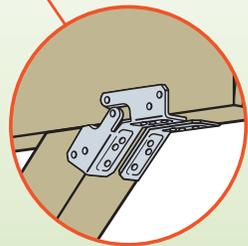
**Joist to Ledger**  
(p. 26)



**Guardrail Infill Component Connections**  
(p. 34)



**Ledger Attachment**  
(p. 22)



**Knee Brace**  
(p. 21)

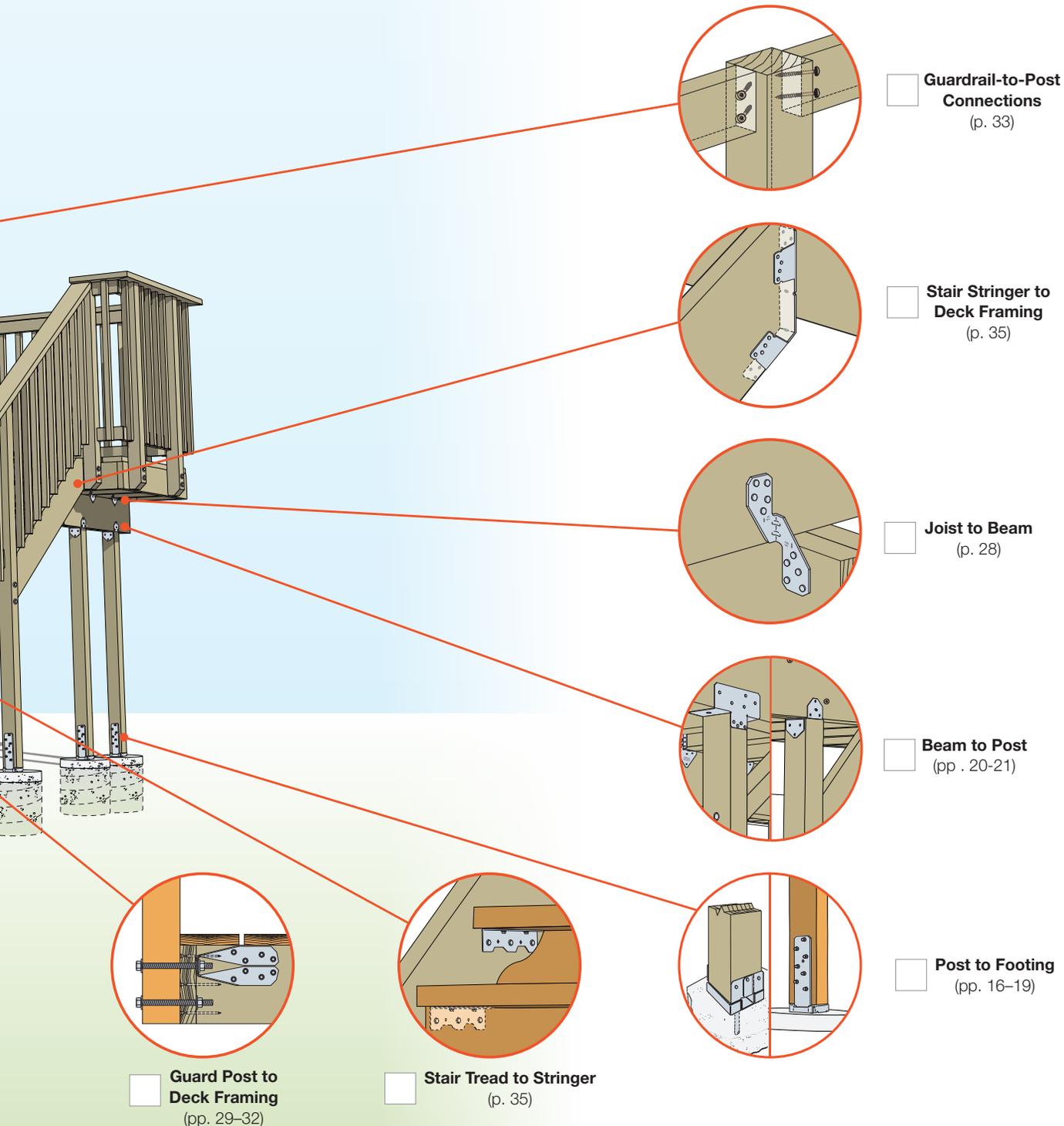
# Critical Deck Connections Checklist

To build a safe, building code-compliant deck, it's essential that the deck design establish a continuous load path using a system of key connections throughout the deck framing. When this system of connections is made properly, loads are transferred through the deck frame and into the ground and/or the adjacent structure to which the deck is connected.

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

For information on the inspection of existing decks, see p. 10. For more information, please refer to the Deck Inspection for New and Existing Construction online training course at [strongtie.com/training](http://strongtie.com/training).

Use the diagram below to determine which deck connections may need retrofitting. For ledger connections to concrete and/or brick, see pp. 23–24.



# Existing Decks: Retrofit or Replace?

## Do I Need to Retrofit?

### Retrofitting an Existing Deck

It's estimated that of the approximately 50 million existing decks, only half are code compliant. Experts believe that many of these decks are potentially unsafe. In situations where it's 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.

### Life Expectancy of Decks

Most experts agree that the average life expectancy of a deck is 10 to 20 years. Decks are exposed to the elements, which can cause deterioration. It's important that decks are properly inspected and maintained on a routine basis. If you are unsure what to inspect for or how often, it's best to consult with a qualified professional, such as a structural engineer, architect, home inspector or contractor, in order to make sure the deck is safe.

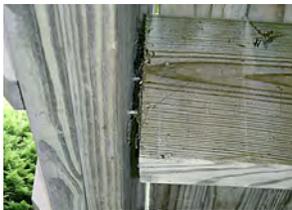
## Five Things to Look for on an Existing Deck

It is recommended that you inspect your deck annually for issues that need to be addressed. It's best to do this prior to seasons when you use your deck most. When inspecting a deck to determine overall safety and compliance with building codes, look at the five areas below. Use this checklist to help ensure a thorough evaluation.



### 1. Improper Connections

Any connections that do not meet the requirements discussed in this guide can compromise the safety of the deck. In many cases, toenailing (i.e., joining two wood members with angled nailing) does not constitute a proper connection. Connectors must be installed with the correct fastener.



### 2. Loose Connections

Vital connections may have degraded over time. Wobbly railings, loose stairs and ledgers that appear to be pulling away from the adjacent structure are all causes for concern.



### 3. Corrosion

Metal connectors and fasteners can corrode over time, especially if a product with insufficient corrosion resistance was originally installed. See pp. 49– 50 for more information on corrosion.



### 4. Decay

Wood can decay with exposure to the elements. Deck framing members that have decayed may no longer be able to perform the function for which they were intended.



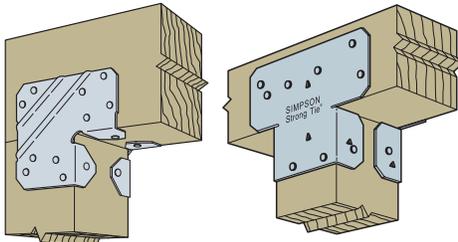
### 5. Splitting

As wood ages, it is common for splitting to develop. Large cracks or excessive splitting can weaken deck framing members.

# Existing Decks: Retrofit or Replace?

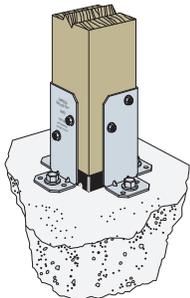
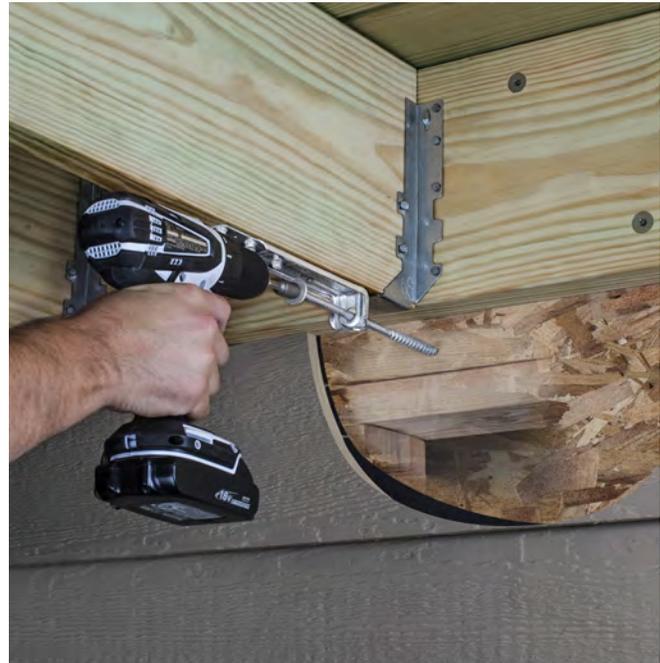
## Connector Solutions for Retrofitting

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 Strong-Tie recommends that deck designs be approved by the local building department before work begins.



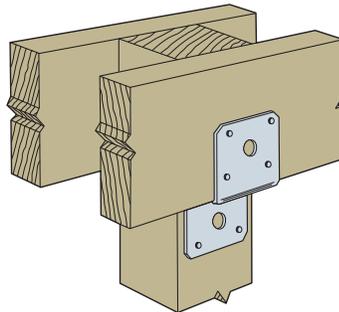
### LCE/AC Post Caps

Two-piece cap may be installed before or after lumber is in place.



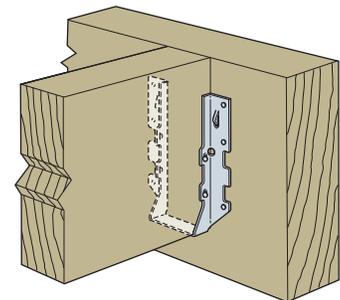
### RPBZ Retrofit Post Base

Reinforcement for post applications.



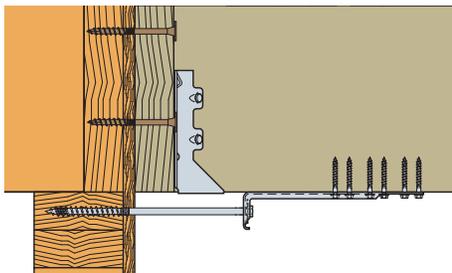
### DJTZ

Connects beams at the side of the post.  
*(available in ZMAX® coating or in stainless steel)*



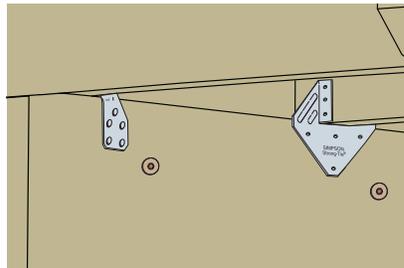
### LUS Joist Hanger

Provides bearing and uplift resistance, features double-shear nailing for added strength.



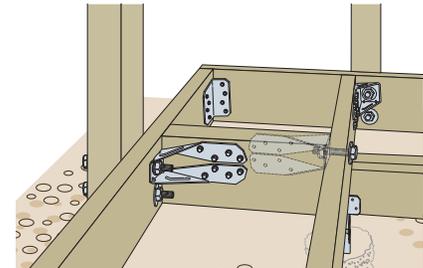
### DTT1Z Deck Tension Tie

Lateral connections into wall plates, header or studs.  
*(siding not shown for clarity)*



### H1 Hurricane Tie

Attaches to both sides of the joist.



### DTT2 Deck Tension Tie

Horizontal application fastening guard post to deck framing.  
*(available in ZMAX coating or in stainless steel)*

# Help for Your Deck Planning

# Deck Planner Software™

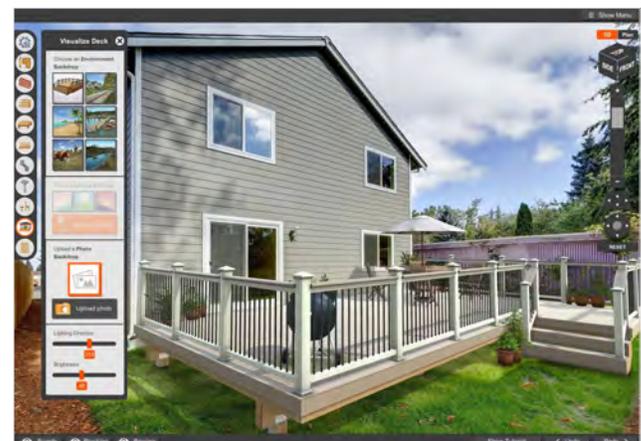
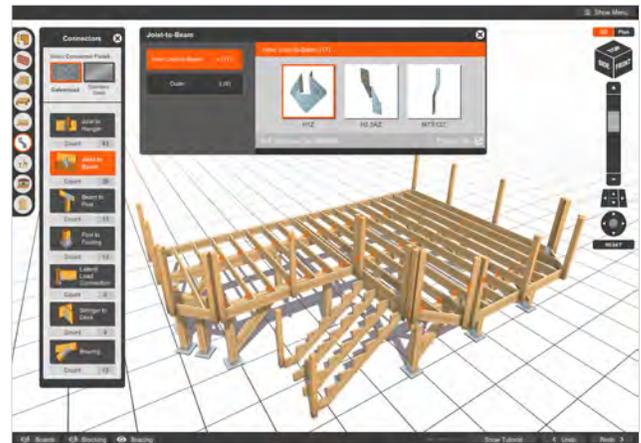
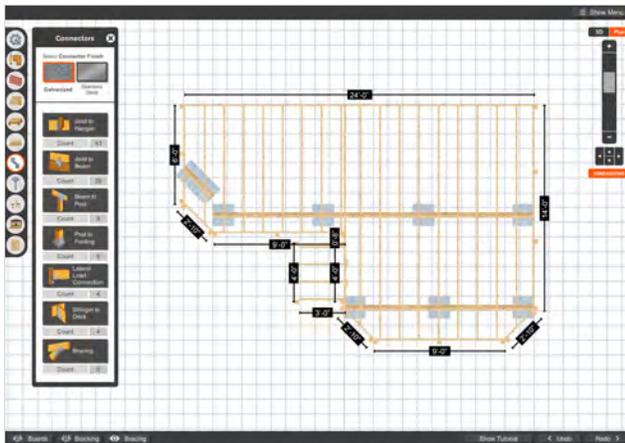
Deck-design software provides a user-friendly means of planning, designing and visualizing new deck construction, as well as deck-remodeled projects.

Simpson Strong-Tie® Deck Planner Software helps you quickly design a custom deck, whether for retrofits or a new build. Once the design is completed, the tool dynamically generates permit submittal pages and a project materials list.

Deck Planner Software allows for the design of decks with fast and powerful editing tools:

- Design in 2D or 3D environments
- Use the deck-shaping tools to insert specific deck dimensions
- Select from different wood species for your framing lumber

The software can also generate full deck plans, specifications and a bill of materials.



# Fastener Software

## Select with Fastener Designer

Fastener Designer is a web-based application that helps you find alternatives to the specified fasteners in your plans, giving you more design flexibility. This application quickly finds alternatives to standard NDS fasteners for six common applications:

- Withdrawal loading
- Lateral load parallel to grain
- Lateral load perpendicular to grain
- Multi-ply
- Ledger connections
- Sole plate to rim board

Results come with detailed load calculations for both the NDS fastener and the recommended Simpson Strong-Tie structural screw. See [strongtie.com/fastenerdesigner](http://strongtie.com/fastenerdesigner) for more info.



## Search with Fastener Finder

Quickly search our wide array of fasteners to find exactly what you need. Search by multiple criteria, such as application, fastener type, finish/material and model number. Explore our extensive product line in seconds in order to compare, specify or buy. Find the right fastener now by accessing our online Fastener Finder. Visit our website at [strongtie.com/ff](http://strongtie.com/ff).



Sort by Name (A to Z) 2275 Refined Results Displayed Below

### 0° Inserted Plastic Coil, Full Round Head, Ring-Shank Nail

These nails feature an annular ring-shank to provide a secure attachment and a checker pattern on head to blend with wood grain and accept surface finishes. Check for tool compatibility.

**Fastener Type:** Collated Nail

Model No.	Coating/Material	Penny Size	Length (in.)	Head Diameter (in.)	Shank Diameter (in.)	Packaging Qty.	UPC
A12A187DNB	Aluminum	-	1 7/8	0.210	0.099	9000	744039613854
S12A225DNB	Type 304 Stainless Steel	7d	2 1/4	0.210	0.099	7200	744039625109
S12A225DNBP	Type 304 Stainless Steel	7d	2 1/4	0.210	0.099	1200	744039557103

# Deck Solutions That Meet Code

# Footings

## Building Code Requirements

### Footings

1. Shall be a minimum 12" x 12" or equivalent (14" round).
2. 12" below undisturbed ground.
3. Footing closer than 5' to an exterior house wall must bear at the same elevation as the existing house foundation footing (DCA 6).
4. Shall be below the frost depth for the region and not bear on frozen soil unless the frozen condition is permanent.
5. Support the live and dead loads properly.
6. Resist the lateral and net induced uplift forces (wind, seismic, occupant, flood loads).

See 2018-IRC, Table R507.3.1 for deck footing sizes based on tributary area and load bearing value of the soil.

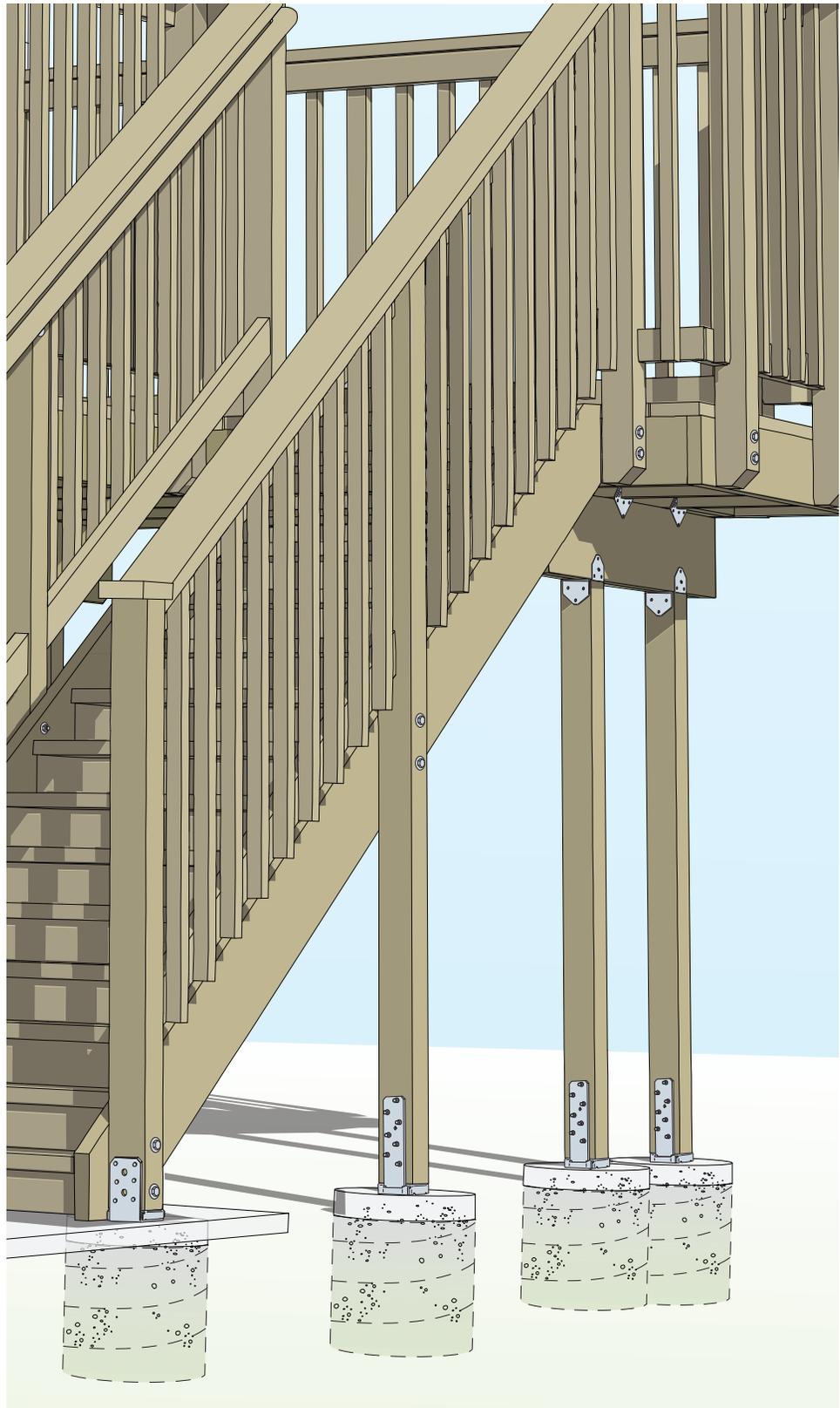
*IRC: 2018-R507.3*

*IRC: 2000-2018-R403.1.1 (Size), R403.1.4 (Minimum depth), R403.1.4.1 (Frost depth)*

*IBC: 1809.4, Table 1809.7 (minimum size and depth), 1809.5 (Frost protection)*

**Note:** In order to achieve published load values, footings must provide sufficient concrete cover of the embedded portion of Simpson Strong-Tie® 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 the Simpson Strong-Tie *Wood Construction Connectors* catalog for more information.

In order for posts to properly resist various types of loads, they must be supported by, and anchored to, concrete slabs and precast concrete piers do not qualify as proper footings for decks attached to the structure.



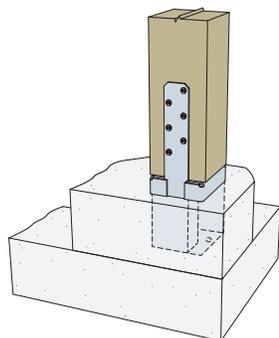
# Post Bases Installed on Existing Concrete

Posts must be properly attached to a concrete footing in order to resist lateral and uplift loads. Preservative-treated wood that is cut must be field treated or the post must be elevated off the concrete by 1".

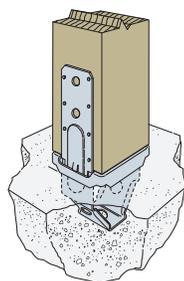
## Simpson Strong-Tie® Solutions

### Cast-in-Place

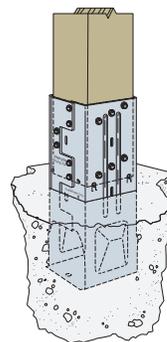
These products are cast into the concrete at the time of the pour.



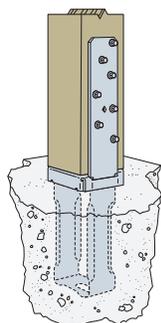
**PPBZ Porch Post Base**  
Features a 1" standoff.  
(available in ZMAX coating)



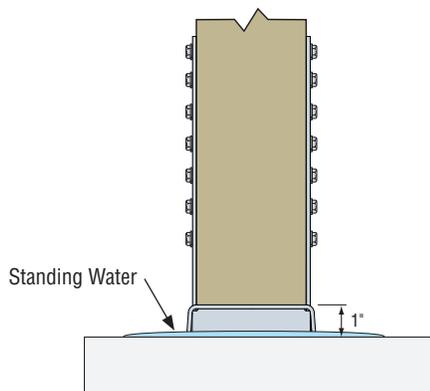
**PBS Post Base with Standoff**  
Features a 1" standoff.  
ZMAX or hot-dip galvanized coating recommended.



**MPBZ Moment Post Base\***  
Provides moment resistance for wooden columns or posts in free-standing structures. Features 1" standoff tabs.



**CBSQ Column Base**  
Installs with Strong-Drive® SDS wood screws and features a 1" standoff. Hot-dip galvanized coating recommended.



A 1" standoff at the base of the post is required when building with wood that is not preservative treated or decay resistant. The standoff plate raises the post end off the concrete, keeping it drier and reducing the chances of decay. For best long-term results, Simpson Strong-Tie recommends that a base with a standoff be used in exterior/wet applications.

### Building Code Requirements

#### Load Resistance

- Columns shall be restrained to prevent lateral displacement at the bottom end. Such lateral restraint shall be provided by manufactured connectors installed in accordance with section R507 and the manufacturer's requirements, or a minimum post embedment of 12 inches in surrounding soils or concrete piers. Wood columns shall not be less in nominal size than 4" x 4".

2015 IRC Section R407.3 and R507.8.1

2015 IBC Section 2304.10.7

2018 IRC Section R407.3 and R507.4

2018 IBC Section 2304.10.7

- Column and post-end connections shall be fastened to resist lateral and net induced uplift forces.

2015 IRC Section R502.9

2015 IBC Section 2304.10.7

2018 IRC Section R502.9

2018 IBC Section 2304.10.7

\*May eliminate bracing, contact design professional for additional information.

# Post Bases Installed on Existing Concrete

## Building Code Requirements

### Load Resistance

- Columns shall be restrained to prevent lateral displacement at the bottom end. Such lateral restraint shall be provided by manufactured connectors installed in accordance with section R507 and the manufacturer's requirements, or a minimum post embedment of 12 inches in surrounding soils or concrete piers. Wood columns shall not be less in nominal size than 4" x 4".

*IRC 2015 Section R507.8.1*  
*IRC 2018 Section R507.4*

- Column and post-end connections shall be fastened to resist lateral and net induced uplift forces.

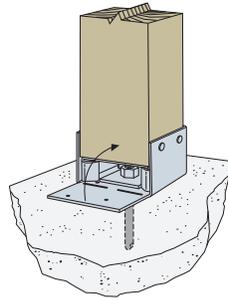
*2015 IRC Section R502.9*  
*2015 IBC Section 2304.10.7*

*2018 IRC Section R502.9*  
*2018 IBC Section 2304.10.7*

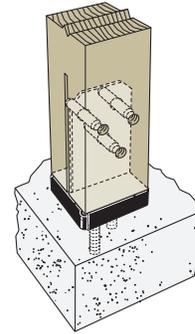
## Simpson Strong-Tie® Solutions

### Post Bases with Anchors

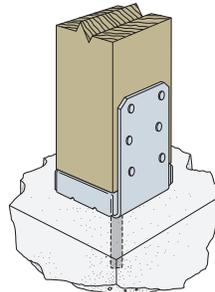
These products utilize anchors installed during the pour or after the concrete hardens.



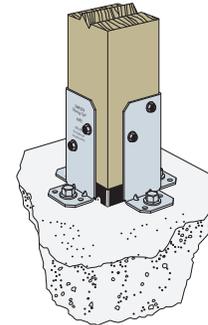
**ABW Adjustable Post Base with Standoff**  
*(available in ZMAX® coating)*



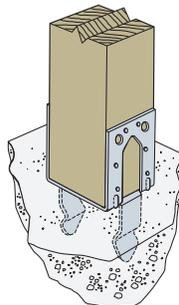
**CPTSS/CPTZ Concealed Post Tie**  
*(available in ZMAX coating and stainless steel)*



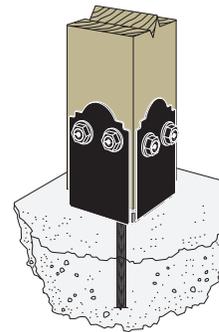
**ABU Adjustable Post Base with Standoff**  
*(available in ZMAX coating and stainless steel)*



**RPB with CPS — Composite Plastic Standoff**  
*(available in ZMAX® coating)*



**PB Post Base**  
For use with decay-resistant or preservative-treated wood. ZMAX® or hot-dip galvanized coating recommended.



**Outdoor Accents® APB Post Base**  
ZMAX® with black powder coating.

# Post Bases Installed on Existing Concrete

## Post-Installed Anchors

Installing a post base on existing concrete requires the installation of a post-installed anchor to attach the base to the concrete. Simpson Strong-Tie offers a variety of mechanical anchors and anchoring adhesives that are code listed for structural applications.

### Mechanical Anchors:

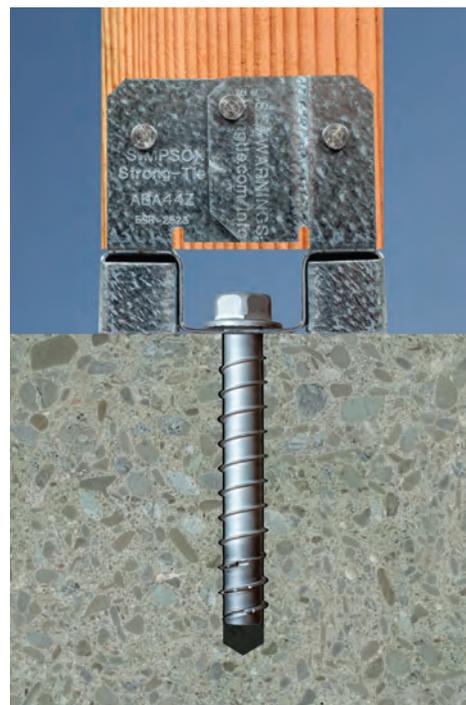
#### Stainless-Steel Titen HD® Screw Anchor

Provides fast and efficient installation, combined with long-lasting corrosion resistance.

- Available in both Type 316 and Type 304 stainless steel
- For use in cracked and uncracked concrete and masonry
- For use in exterior and most corrosive environments
- Available in 3/8", 1/2", 5/8" and 3/4" diameters and multiple lengths (3" to 8 1/2")
- Serrated carbon-steel threads at the cutting tip, minimizing potential corrosion damage to the concrete or masonry

**For more information on anchoring to concrete, go to [strongtie.com](http://strongtie.com) or refer to the following literature:**

- Anchoring ZMAX® post bases with the stainless-steel Titen HD, see L-PBTHDSS.
- Deck ledger to concrete wall connections, see L-A-THDSSLDGR.
- Deck ledger to masonry wall connections, see L-A-LDGRGFCMU.



### Anchoring Adhesives

Anchoring adhesives are ideal when maximum strength is needed. These products are available in a variety of cartridge sizes, including convenient single-tube cartridges. Hot-dip galvanized or stainless-steel threaded rod recommended.



**SET-3G™**  
High-Strength Epoxy Adhesive

- For threaded rod and rebar
- Install in dry, water-saturated or water-filled holes in base materials with temperatures between 40°F and 100°F
- NSF/ANSI standard 61 approved





**SET-XP®**  
High-Strength Epoxy Adhesive

- For threaded rod and rebar
- NSF/ANSI standard 61 approved





**AT-XP®**  
High-Strength, Fast-Cure, All-Weather Acrylic Adhesive

- For threaded rod and rebar
- Can be used in cold temperatures as low as 0°F
- NSF/ANSI standard 61 approved



For more information on these products, see the Simpson Strong-Tie *Anchoring and Fastening Systems for Concrete and Masonry* catalog or visit [strongtie.com/anchors](http://strongtie.com/anchors).

# Beam-to-Post Assemblies and Connections

## Building Code Requirements

- Deck beams shall be fastened together with two rows of 10d (0.128" x 3") box nails minimum at 16" o.c. along each edge.

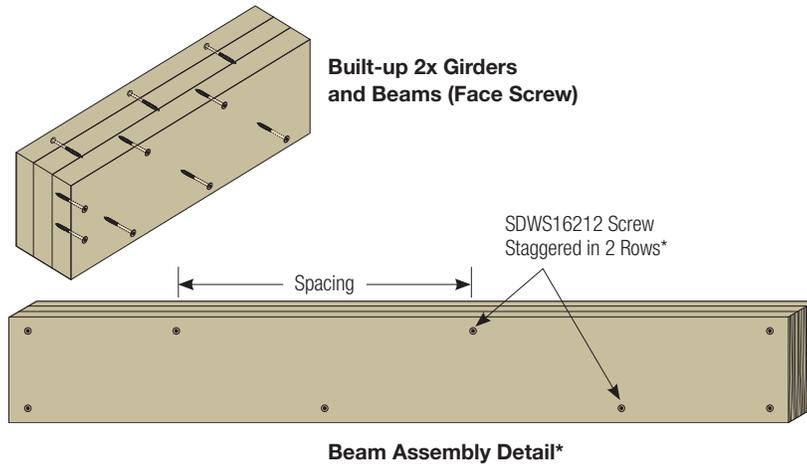
*IBC 2018 Section 2304.10.1*  
*IRC 2018 Section R507.5*

- Deck beams shall be attached to deck posts in accordance with Figure R507.7.1 or by other equivalent means capable to resist lateral displacement.

*IRC 2015 Section R507.7.1*  
*IRC 2018 Section R507.5.2*

## Multi-Ply Beam Assemblies

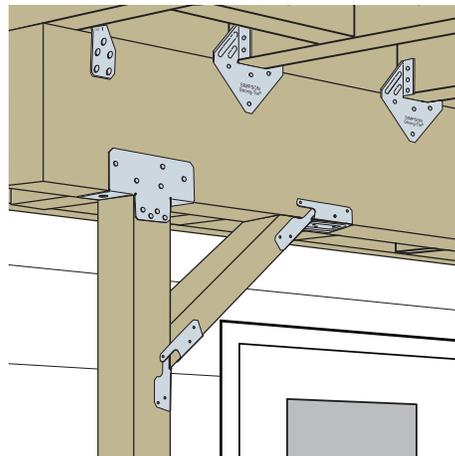
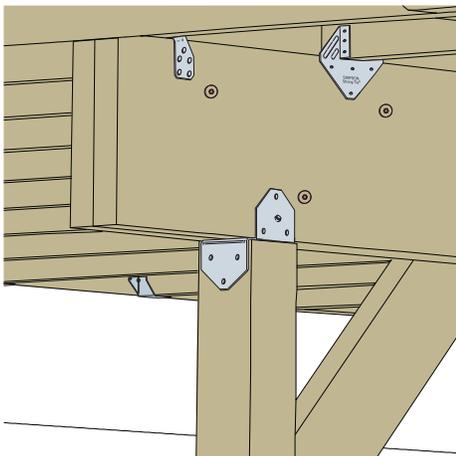
For multi-ply beam assemblies, the Strong-Tie® SDWS Framing screw can be used as an alternative to 10d (0.128" x 3") box nails, when installed in the following configuration.



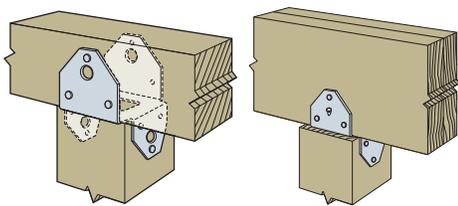
\*Fastening pattern shown applies to each ply of the built-up 2x beam..

## Beam-to-Post Connections

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.

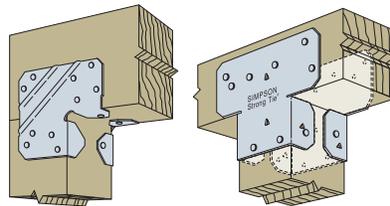


## Simpson Strong-Tie® Solutions



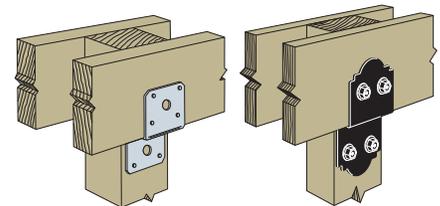
### BC/BCS Post Cap

For single-member solid sawn beams. Connects double 2x's to a 4x post or triple 2x's to a 6x post. ZMAX® coating or stainless steel recommended.



### LCE/AC 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. ZMAX coating or stainless steel recommended.

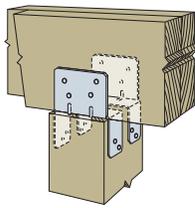


### DJT Deck Joist Tie and Outdoor Accents® APDJT2-6

Deck Joist Tie ZMAX (APDJT with black powder coat).

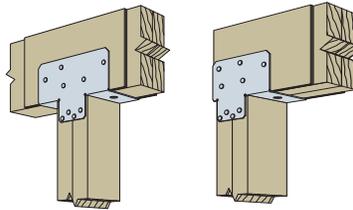
# Beam-to-Post Assemblies and Connections

## Simpson Strong-Tie® Solutions



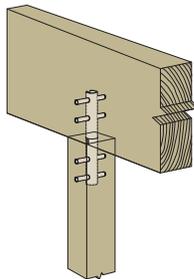
### LPC Post Cap

Two-piece cap adjusts for beams smaller than post width. Features a ZMAX® coating.



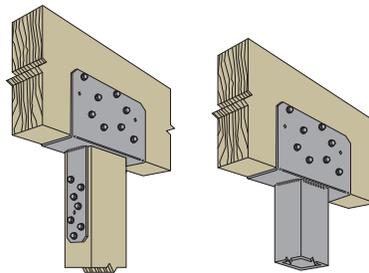
### PCZ/EPCZ Post Caps

Connects beams at the top of the post. Features ZMAX coating. Installation without shims, similar.



### CBTZ Concealed Beam Tie

Provides clean look for beam-to-post connections. ZMAX coating.

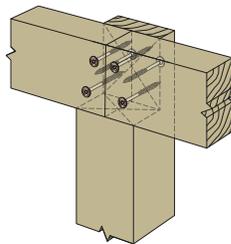


### CCQ Beam-to-Post Connections

Provides a strong connection for column-beam combinations. (Gray paint, also available in HDG and stainless steel)

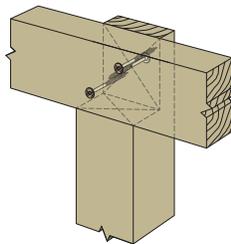
The following are alternative connections for select beam-to-post assemblies.

### Beam-to-Post Connection



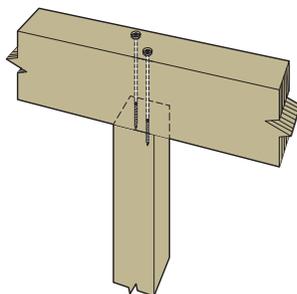
### Beam-to-Notched Post, Spliced

Uses Strong-Drive® SDWS Timber or Timber SS screws\*



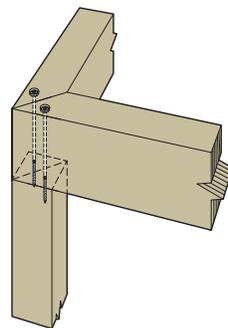
### Beam-to-Notched Post, Non-Spliced

Uses Strong-Tie SDWS Timber or Timber SS screws\*



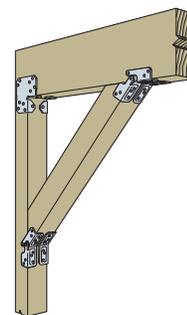
### Continuous Beam over Post

Uses Strong-Drive SDWS Timber Screws.



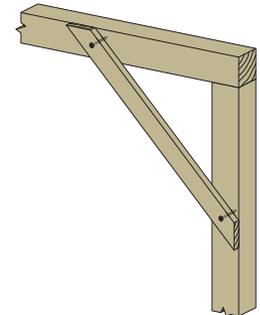
### Mitered Beam over Corner Post

Uses Strong-Drive SDWS Timber Screws.



### KBS1Z

Connects diagonal bracing to beams and columns. ZMAX coating. (If using an MPB, diagonal bracing may not be necessary. Contact a design professional for additional information.)



### Alternative Diagonal Bracing

Uses Strong-Drive SDWS Timber or SDWS Timber SS screws\*

### Building Code Requirements

- Deck beams shall be fastened together with two rows of 10d (0.128" x 3") box nails minimum at 16" o.c. along each edge.

IRC 2018 Section R507.5

IRC 2015 Section R507.6

IRC 2018 Table 2304.10.1

- Deck beams shall be attached to deck posts in accordance with Figures R507.5.1(1) and R507.5.1(2)-2018 R507.7.1-2015 or by other means capable to resist (horizontal-in 2018, only)/ lateral displacement.

IRC 2015 Section R507.7.1

IRC 2018 R507.5.1(1) and

R707.5.1(2), R507.5.2

- 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 2015/2018 Section R502.9

IBC 2015/2018 Section

2304.10.7

\*For more information, see engineering letter L-F-DCA6SCREW.

# Ledger Connections

## Building 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. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal.

IRC 2015/2018 Section R507.1  
IBC 2015/2018 Section 1604.8.3

- Deck ledgers shall not be supported on stone or masonry veneer.

IRC 2015/2018 Section R507.2.1

- 1/2" lag screws and 1/2" bolts may be used for a ledger to band joist, to support a live or snow load of 40 psf or less and a dead load of 10 psf.

IRC 2015/2018 Table R507.2

- Deck ledger connections to band joists shall be in accordance with this section. For other grades, species, connection details and loading conditions, deck ledger connections shall be designed in accordance with IRC Section R301.

IRC 2015 Section R507.2

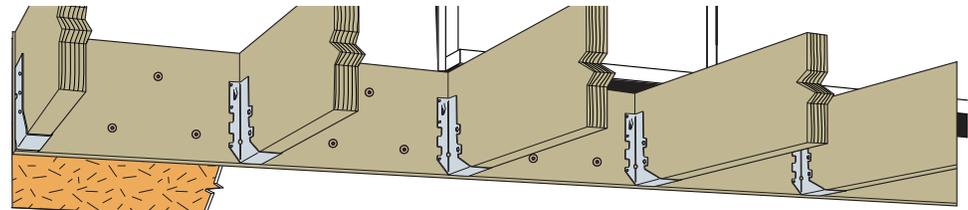
- Vertical and lateral supports at band joist. Vertical and lateral support for decks shall follow this section.

IRC 2018 Section R507.9

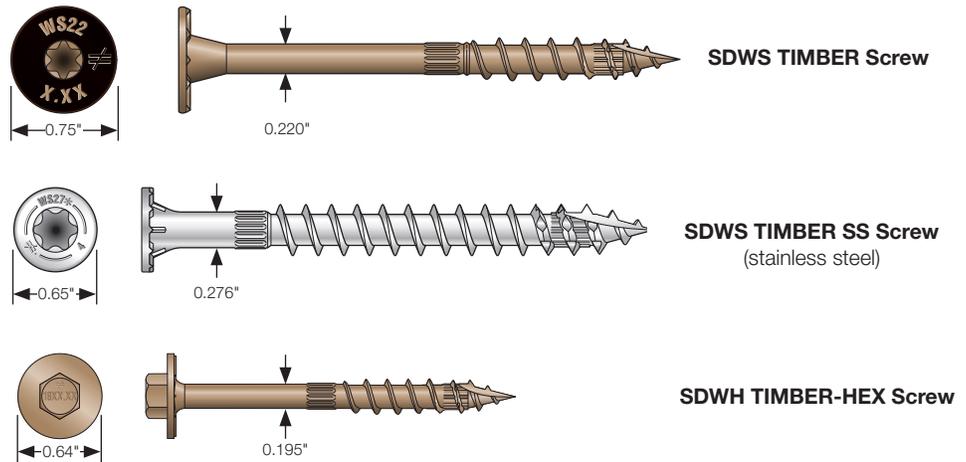
## Vertical Ledger Support at Home's Band Joist

One of the most common causes for deck failure is ledgers that pull away from the primary structure, resulting in complete collapse.

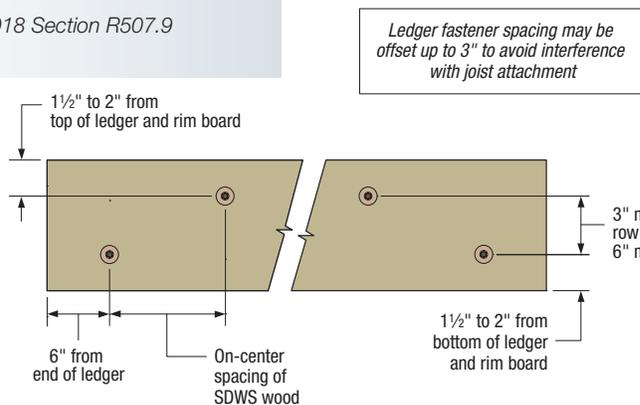
The Simpson Strong-Tie® Strong-Drive® SDWS Timber, SDWS Timber SS and SDWH Timber-Hex structural wood screws provide an easy-to-install, high-strength alternative to lag screws and through-bolts. They are ideal for securely attaching ledgers to structural wood members, are easier to drive than comparable fasteners and are available in stainless steel or coated for many exterior and preservative-treated wood applications.



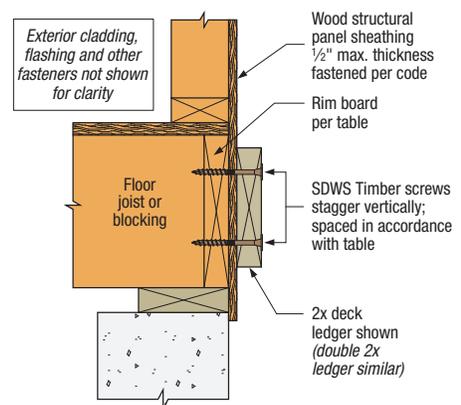
### Strong-Drive Structural Wood Screw



- Patented SawTooth™ points, serrated thread and knurled shank reduce installation torque
- Identification on all screw heads
- Low-profile washer head on SDWS provides excellent bearing area and a clean look
- For decks in severe corrosion environments, use the Strong-Drive SDWS Timber SS (page 37) or Strong-Drive SDWH Timber-Hex HDG (page 37)



**SDWS/SDWH Screw Spacing Detail**



**Ledger-to-Rim Board Assembly**

For more information on ledger attachment, see *Fastening Systems* catalog Technical Supplement C-F-2019TECHSUP and flier F-F-SDWSSDWH.

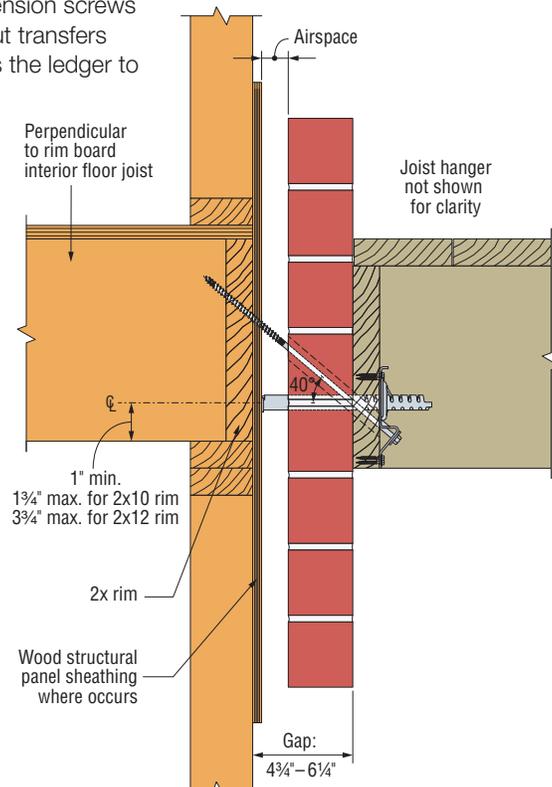
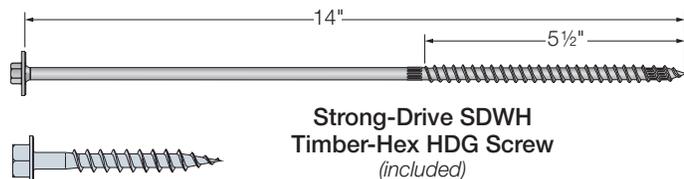
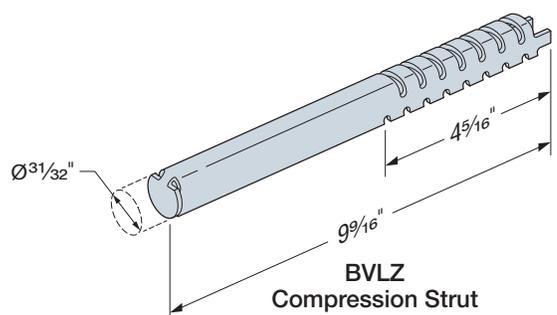
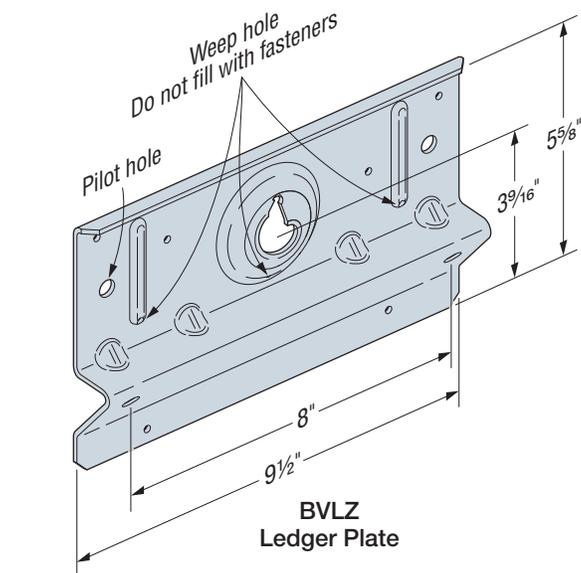
# Ledger Connections

## Vertical Ledger Support at Band Joist Through Brick Veneer

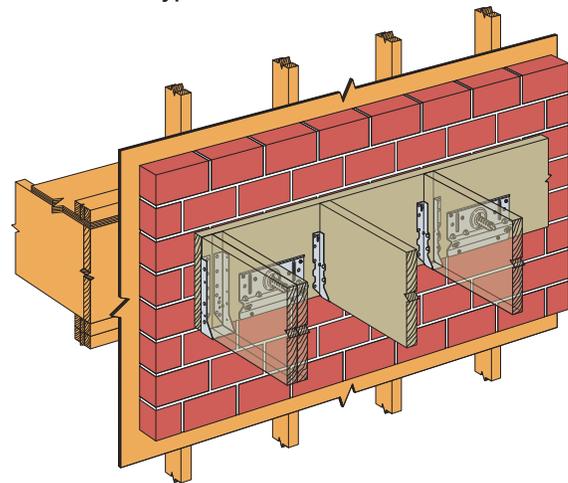
### BVLZ Brick Veneer Ledger Connector

The BVLZ brick veneer ledger connector provides a new code-compliant, tested solution for safely adding a deck to an existing house with masonry veneer exterior. It attaches a wood ledger to the framing through the veneer. This connector kit provides a viable alternative to building a free standing deck, and it installs without having to remove or replace large sections of masonry veneer.

The BVLZ brick veneer ledger connector kit includes a steel ledger plate, a compression strut, installation guide, two 14" Strong-Drive® SDWH Timber-Hex HDG tension screws and six Strong-Drive SD Connector shear screws. It's designed so the two tension screws pass through the mortar into the structural framing, and the compression strut transfers compression forces from the ledger plate to the rim joist. The system enables the ledger to hang freely without bearing on the brick veneer.



Typical BVLZ Installation



Typical BVLZ Installation

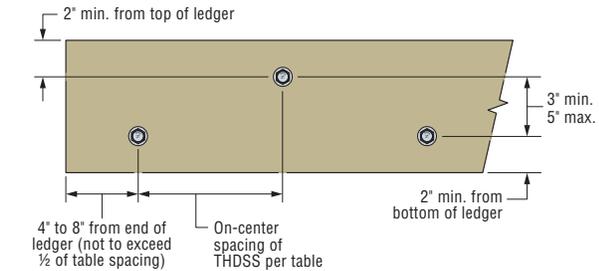
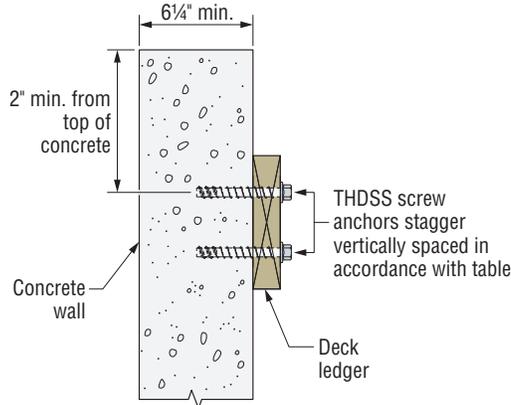
For more information on ledger attachment, see C-C-2019, pp. 290-291 or [strongtie.com/bvlz](http://strongtie.com/bvlz).

# Ledger Connections

## Vertical Support at Concrete or CMU

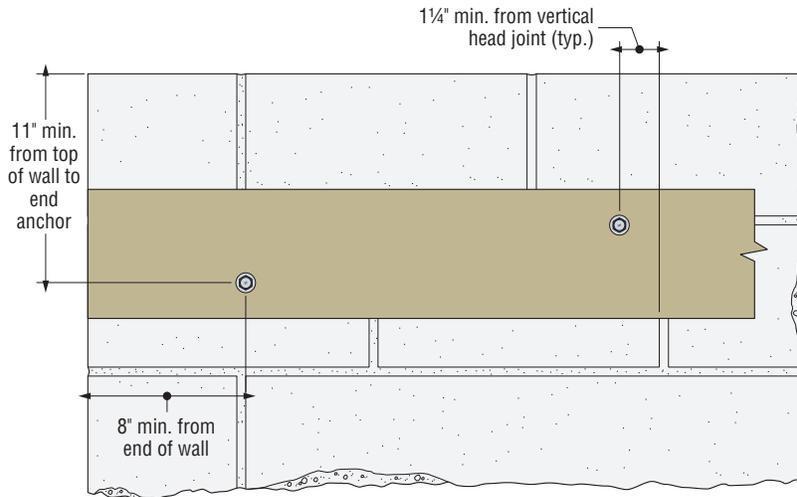
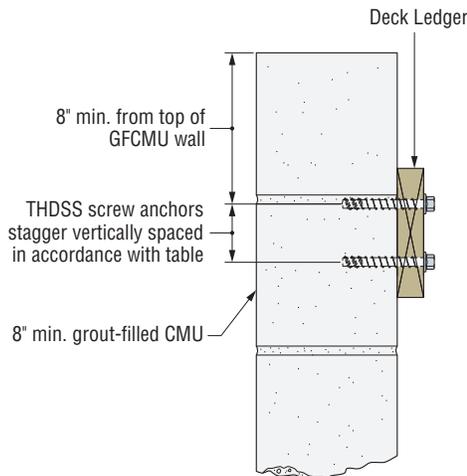
### Titen HD® SS Stainless-Steel Anchor

The Simpson Strong-Tie® Stainless Steel Titen HD (THDSS) (see p. 19), may be used to attach a deck ledger to either a concrete or grout-filled concrete masonry unit (GFCMU) wall in accordance with the International Residential Code (IRC). For more information, refer to L-A-THDSSLDGR for concrete walls, and L-A-LDGRGFCMU for GFCMU walls. The anchor is available in either Type 304 or Type 316 stainless steel.

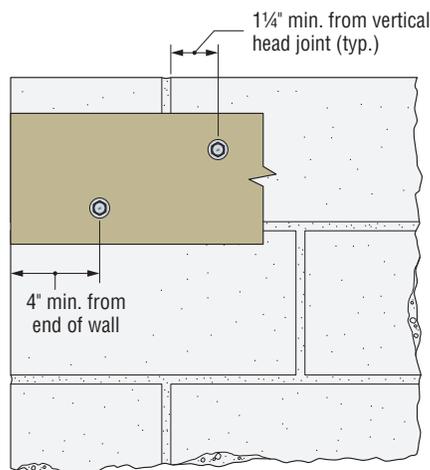
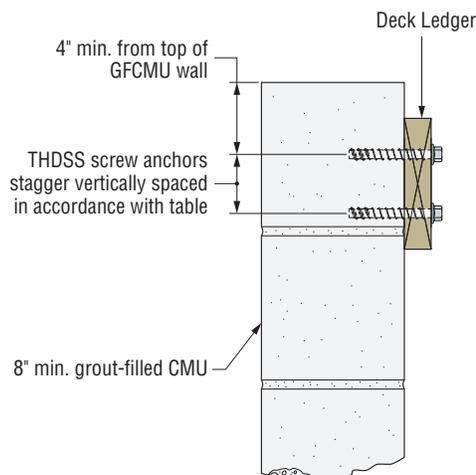


**THDSS Screw Anchor Spacing Detail for Ledgers**

### Ledger-to-Concrete Wall Attachment



**Ledger-to-GFCMU Wall Attachment (Condition 1)**



**Ledger-to-GFCMU Wall Attachment (Condition 2)**

# Ledger Connections

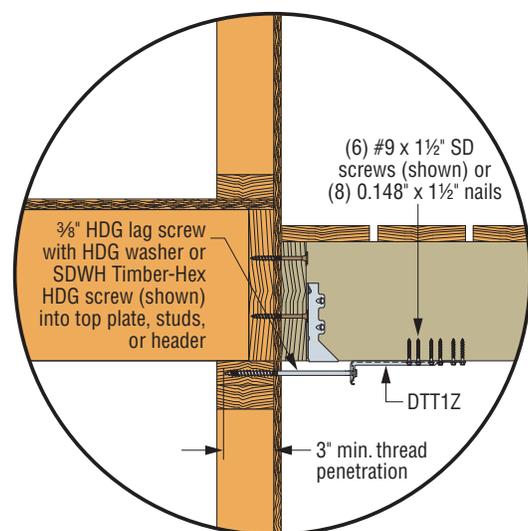
## Lateral Support at Band Joist

For decks that are partially supported by an adjacent structure (such as a house), the connection between the deck and that structure is vital. A bolted or screwed ledger-to-rim-board connection is suitable to support gravity loads; however, in some cases the building codes require a connection that is able to resist lateral loads. In these situations, tension ties are typically called out to tie the joists of the deck directly to the structure.

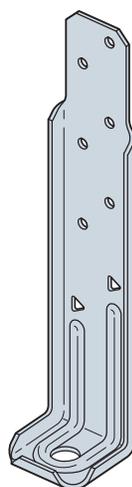
DTT deck tension ties are a safe, cost-effective solution designed to meet or exceed lateral-load code requirements for deck construction.

DTT1Z satisfies the 2015/2018 IRC provision for a 750 lb. lateral-load connection to the house at four locations per deck. This code detail permits the lateral connection from the deck joists to be made to top plates, studs or headers within the supporting structure.

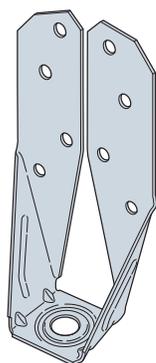
DTT2 can be used to satisfy the 2015/2018 IRC provision for a 1,500 lb. lateral-load connection at two locations per deck.



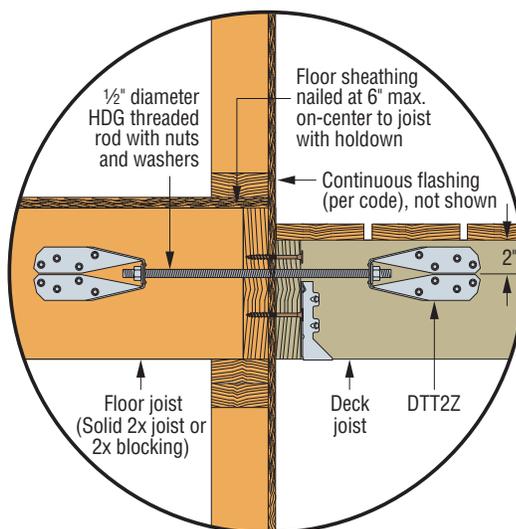
**Figure 2**  
**Typical DTT1Z Deck-to-House**  
**Lateral-Load Connection**



**DTT1Z Deck**  
**Tension Tie**



**DTT2 Deck Tension Tie**  
*(available in ZMAX<sup>®</sup>*  
*and stainless steel)*



**Figure 1**  
**Typical DTT2 Deck-to-House Lateral**  
**Load Connection**

### Building Code Requirements

- The deck shall be positively anchored to the primary structure and designed for both the vertical and lateral loads in accordance with Figure R507.8 (2015 IRC Figure R507.1).

*IRC 2018 Section R507.8*  
*IRC 2015 Section R507.1*

- Where the lateral-load connection is permitted to be installed per Figure 1, holddown tension devices shall be installed in not less than two locations per deck, within 24 inches of each end of the deck, and have an allowable stress design capacity not less than 1,500 lb.

*IRC 2018 Section R507.9.2*  
*IRC 2015 Section R507.2.4*

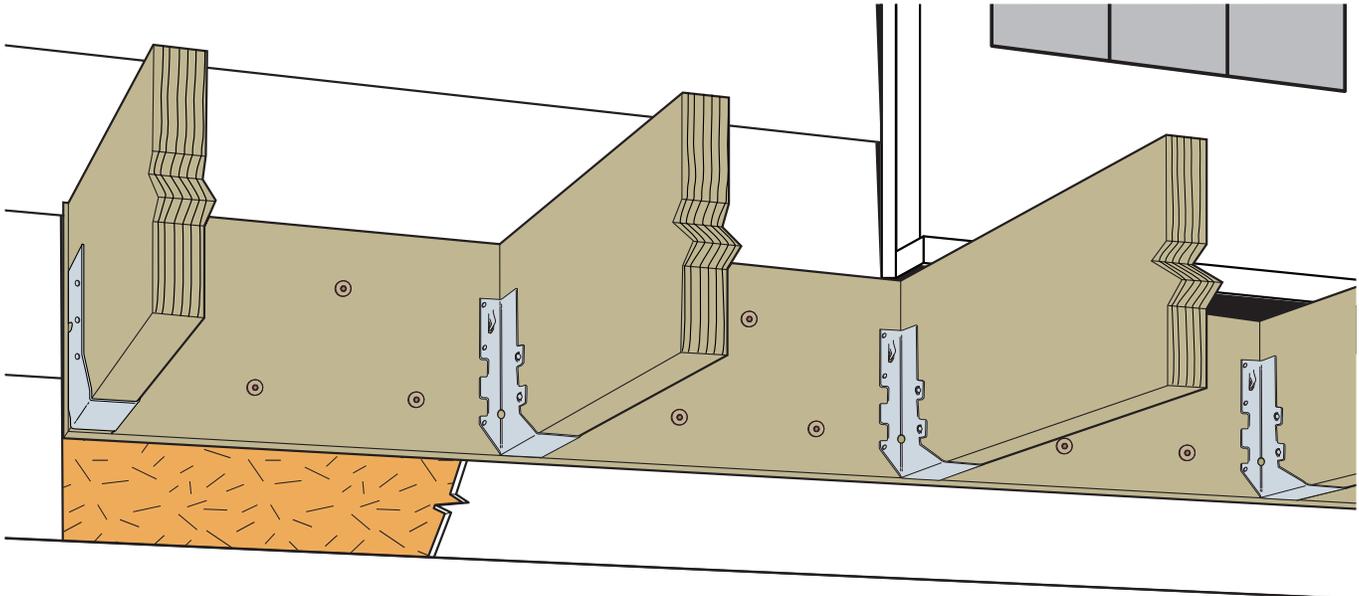
- Where the lateral-load connections are provided in accordance with Figure 2, the holddown device shall be within 24 inches of each end of the deck, and have an allowable stress design capacity of not less than 750 lb.

*IRC 2018 Section R507.9.2*  
*IRC 2015 Section R507.2.4*

For more information on lateral-load connections, refer to Simpson Strong-Tie technical bulletin T-C-DECKLAT at [strongtie.com](http://strongtie.com).

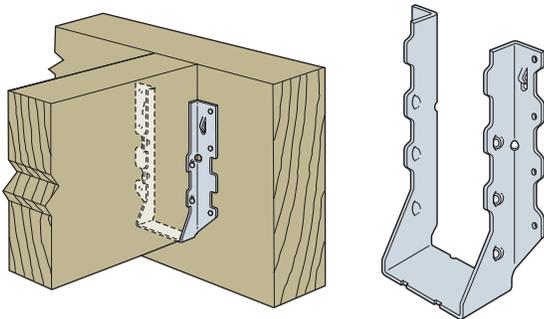
# Joists Terminating into Beam/Ledger

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



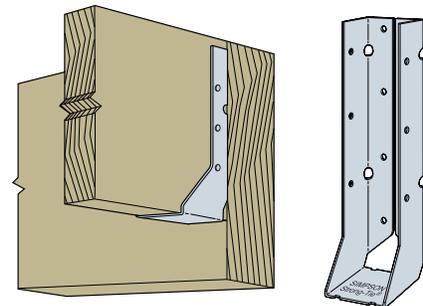
Ledger may not be installed over siding or stucco. It must be fastened directly to the rim board, or fastened to the rim board through the sheathing.

## Simpson Strong-Tie® Solutions



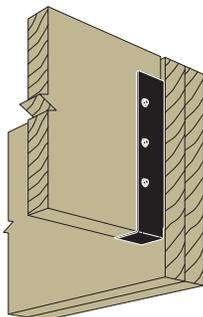
### HUS/LUS Joist Hanger

Provides bearing and uplift resistance, features double-shear nailing for added strength. ZMAX® coating or stainless steel required.  
(LUS shown)



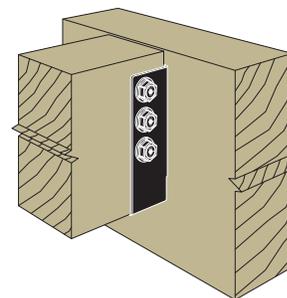
### HUC/LUC Concealed Flange Joist Hanger

Provides bearing and uplift resistance, concealed flanges for cleaner look and for end conditions. ZMAX coating or stainless steel required.  
(LUC shown)



### APLH Outdoor Accents® Light Joist Hanger

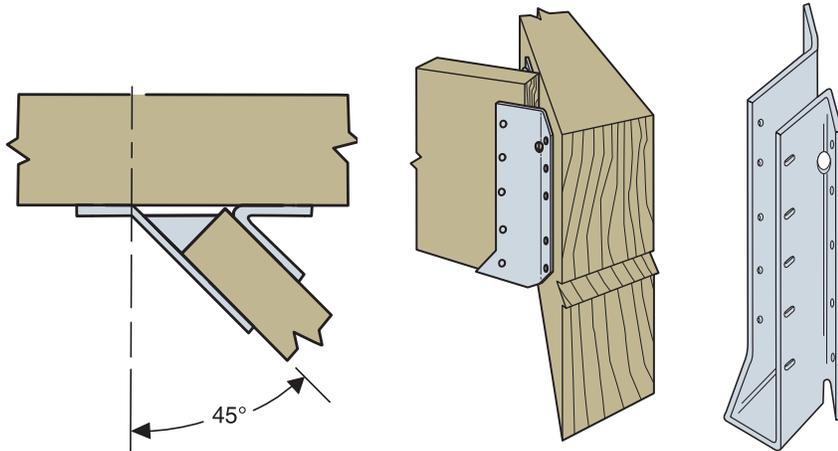
Provides bearing and uplift resistance, concealed flanges for cleaner look and end conditions. ZMAX with black powder coating. Uses black SD10112DDBB fasteners.



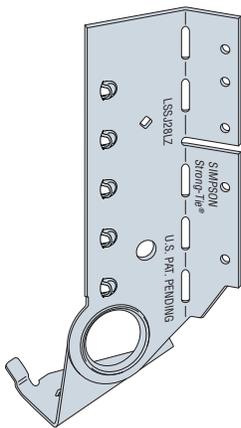
### APHH Outdoor Accents Heavy Joist Hanger

Provides bearing and uplift resistance, concealed flanges for cleaner look and end conditions. ZMAX with black powder coating. Uses STN22 washer and SDWS22312DDBB fasteners.

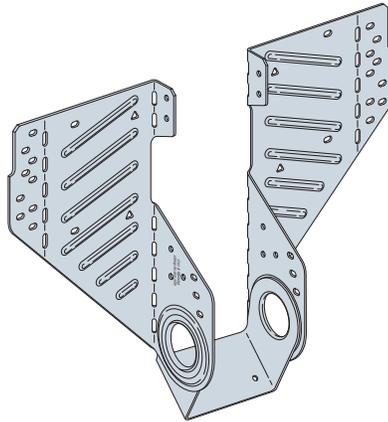
# Joists Terminating into Beam/Ledger



**SUR/SUL Skewed Joist Hanger**  
45° skewed hanger (available in skewed right and left versions), provides bearing and uplift resistance. ZMAX® coating or stainless steel required.



**LSSJ28LZ**

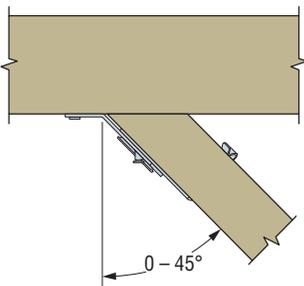


**LSSR210-2Z**

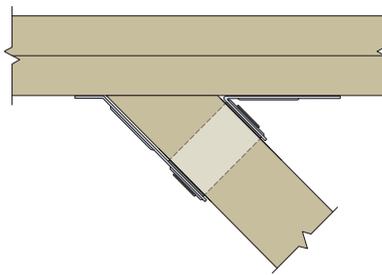
For use with double 2x lumber.

**LSSR/LSSJ Field-Skewable Joist Hanger**

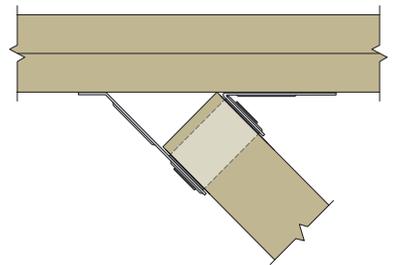
LSSR field skewable right or left up to 45° (order LSSJ in left or right skews). These hangers provide bearing and uplift resistance. Also field slopeable up or down to 45°. Available with a ZMAX coating.



**Typical LSSJRZ Installation**  
(bevel cut required)



**Typical LSSR Installation**  
(compound miter cut)



**Alternate LSSR Installation**  
(plumb cut)

**Building Code Requirements**

**Bearing**

- The ends of each joist, beam or girder shall have at least 1½" of bearing on wood or metal.

*IRC 2018 Section R507.6.1  
IRC 2015 Section R507.7  
IRC 2015/2018 Section R502.6  
IBC 2015/2018  
Section 2308.4.2.2*

- Joists framing into the side of a ledger board or beam shall be supported by approved joist hangers.

*IRC 2015 Section R507.7  
IRC 2018 Section R507.6.1*

**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 2018 Section R507.8  
IBC 2018 Section 1604.8.3*

# Joists Bearing on a Beam

## Building 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 2015/2018 Section R502.9*  
*IBC 2015/2018 Section 2304.10.7*

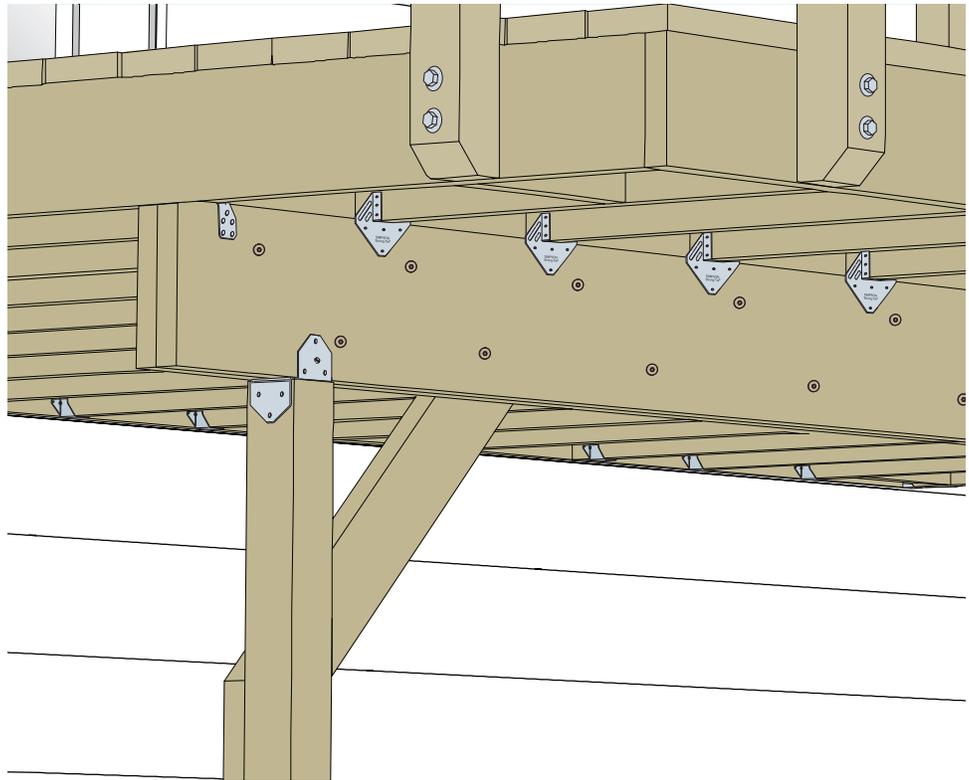
- Joist ends and bearing locations shall be provided with lateral restraint to prevent rotation.

*IRC 2018 Section R507.6.2*  
*IBC 2018 Section 2308.4.2.3*  
*IBC 2018 Section 2308.8.2*

- Joists bearing on top of a single-ply beam or ledger shall be attached by a mechanical connector. Joists bearing on top of a multiple-ply beam or ledger shall be fastened in accordance with Table R602.3(1).

*IRC 2018 Section R507.6.2*

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.

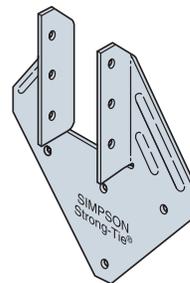


## Simpson Strong-Tie® Solutions



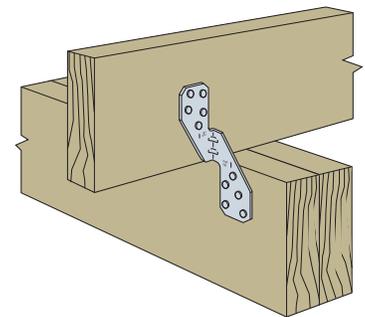
### HTSQ Twist Strap

Designed to resist uplift for decks and beams. Available in ZMAX® and stainless steel.



### H1Z Hurricane Tie

Holds joist on both sides. ZMAX coating recommended.



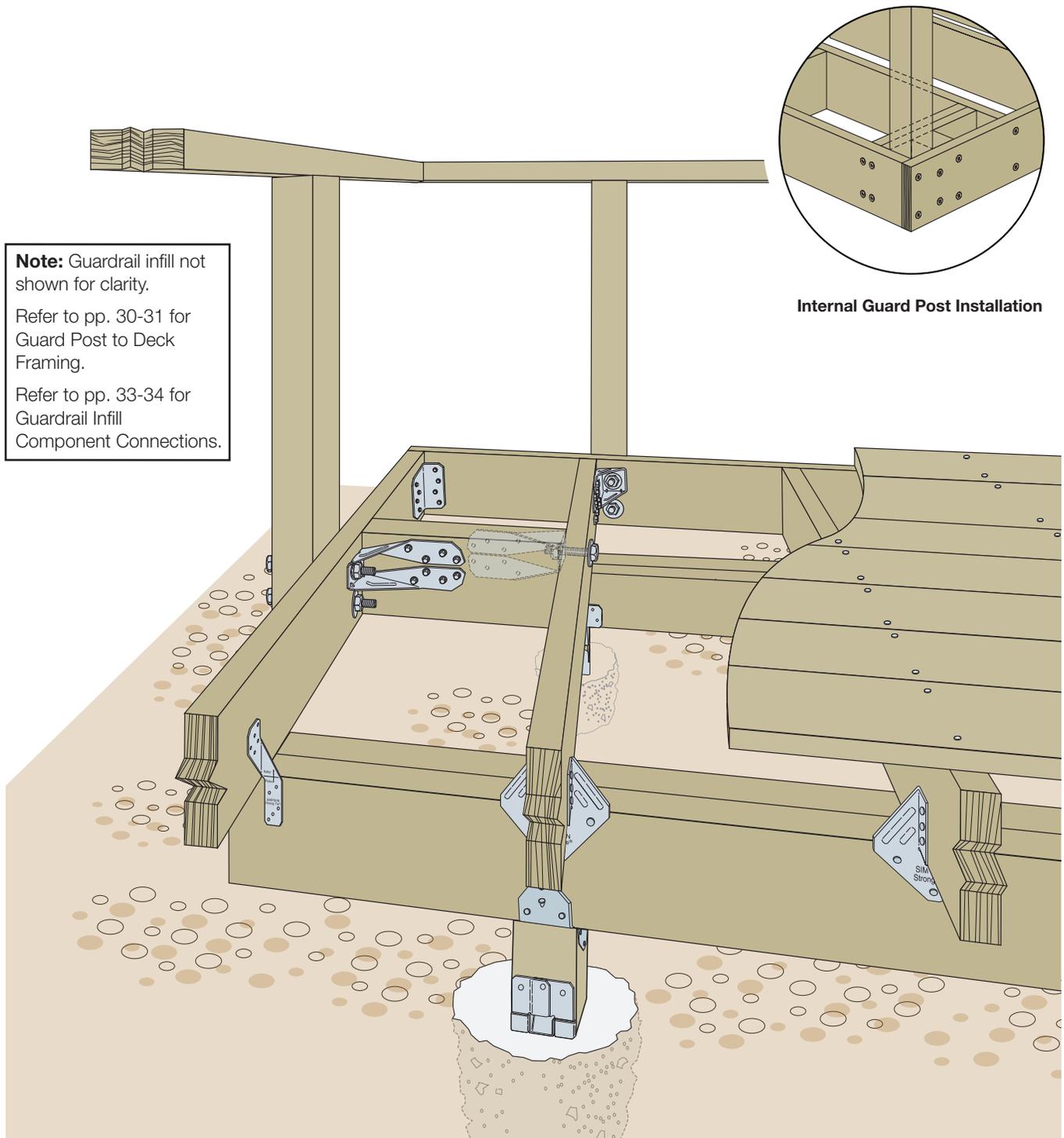
### H2.5A Hurricane Tie

Suitable for single-sided applications. ZMAX coating or stainless steel recommended.

Simpson Strong-Tie offers a full range of hurricane ties for all types of applications and load requirements. See the Simpson Strong-Tie *Wood Construction Connectors* catalog for more information.

# Guard Post to Deck Framing

The guard post connection is a crucial connection pertaining to deck safety, and it is often inadequately constructed. In order to provide the required load resistance at the guard, 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 on pp. 29–32 have been shown through testing or analysis to resist the required 200 lb. concentrated load (or load of 50 lb. per linear foot per IBC) applied in an outward direction for maximum guard heights of 36" and 42" above the deck surface.



**Note:** Guardrail infill not shown for clarity.  
Refer to pp. 30-31 for Guard Post to Deck Framing.  
Refer to pp. 33-34 for Guardrail Infill Component Connections.

**Internal Guard Post Installation**

For more information on this application, see Simpson Strong-Tie technical bulletin T-C-GRDRLPST.

# Guard Post to Deck Framing – Holdown Details

## Building Code Requirements

### When required

- Guards shall be located along open-sided walking surfaces, including stairs, ramps and landings, that are located more than 30" measured vertically to the floor or grade below at any point within 36" horizontally to the edge of the open side.

*IRC 2015/2018 Section R312.1.1*  
*IBC 2015/2018 Section 1015.2*

### Height

- Guards shall be a minimum of 36" tall (IRC) or up to 42" tall for certain occupancies (IBC).

*IRC 2015/2018 Section R312.1.2*  
*IBC 2015/2018 Section 1015.3*

### Load Resistance

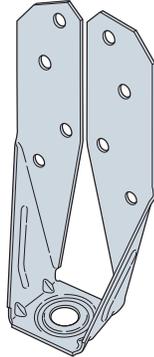
- Guards and handrails shall be able to resist a single concentrated load of 200 lb., applied in any direction at any point along the top.

*IRC 2015/2018 Table R301.5*  
*IBC 2015/2018 Section 1607.8.1*  
*(one- and two-family dwellings)*

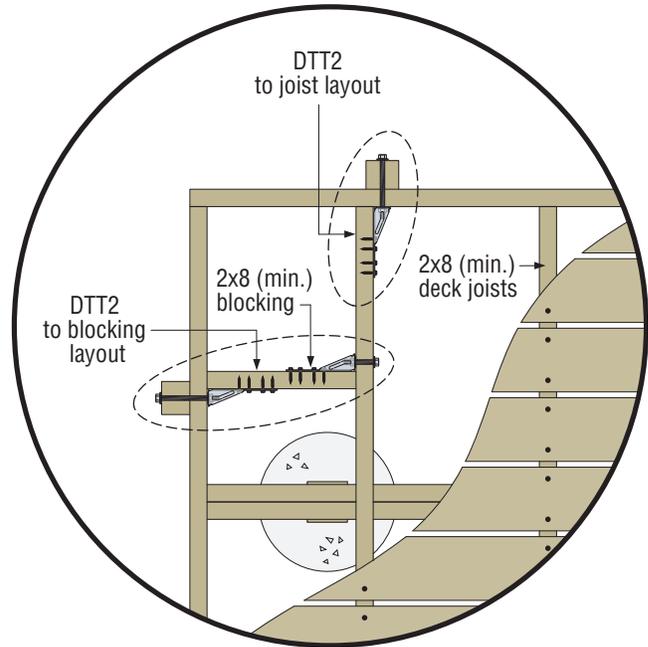
- Handrails and guards shall be designed to resist a load of 50 pounds per linear foot.

*IBC 2018 Section 1607.8.1*  
*(not required for one- and two-family dwellings)*

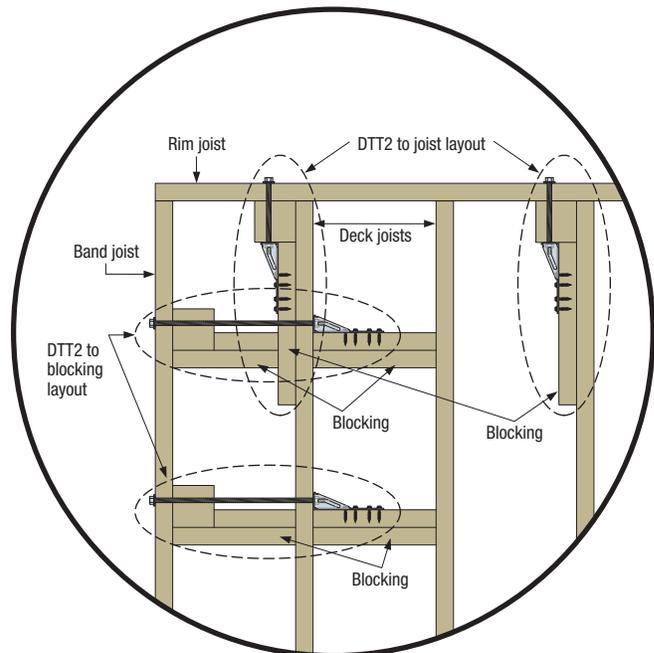
## Simpson Strong-Tie® Solutions For 36"-Tall Guard Posts



**DTT2 Deck Tension Tie**  
*(available with ZMAX® coating or in stainless steel)*



**DTT2 Attachment of Guardrail**  
Post Outside Rim/Joist



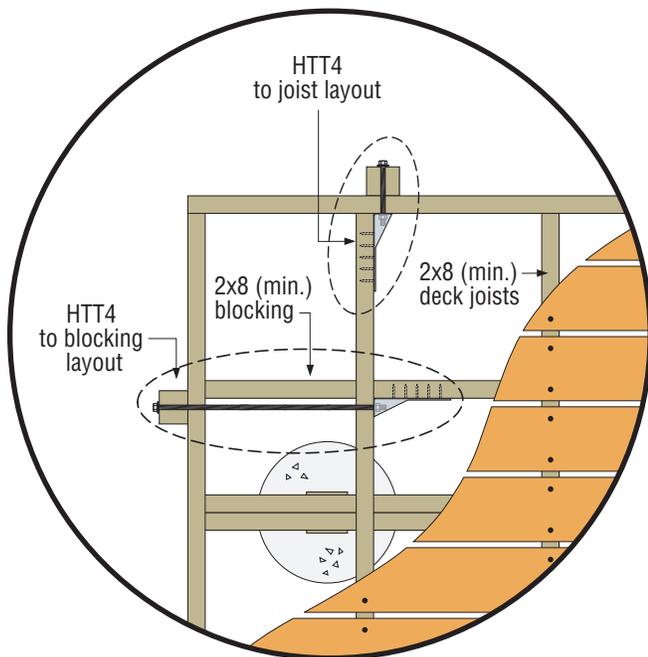
**DTT2 Attachment of Guardrail**  
Post Inside Rim/Joist

**Note:** The DTT2 may also be used to secure 42" guard posts with 2x10 (min.) deck joists.

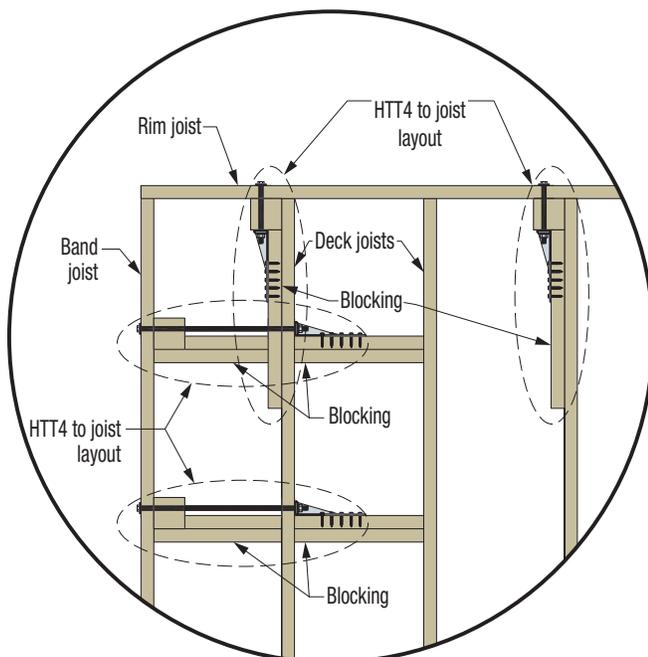
For more information on connecting posts inside the rim joist using the DTT2 or HTT4, see Simpson Strong-Tie technical bulletin T-C-GRDRLPST.

# Guard Post to Deck Framing – Holdown Details

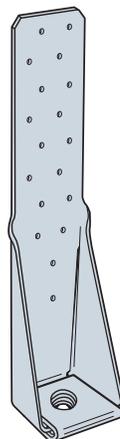
For 42"-Tall (maximum) Guard Posts



**HTT4 Attachment of Guardrail**  
Post Outside Rim/Joist



**HTT4 Attachment of Guardrail**  
Post Inside Rim/Joist



**HTT4 Tension Tie**  
Also available with hot-dip galvanized coating.

## Building Code Requirements

### When required

- Guards shall be located along open-sided walking surfaces, including stairs, ramps and landings, that are located more than 30" measured vertically to the floor or grade below at any point within 36" horizontally to the edge of the open side.

*IRC 2015/2018 Section R312.1.1  
IBC 2015/2018 Section 1015.2*

### Height

- Guards shall be a minimum of 36" tall (IRC) or up to 42" tall for certain occupancies (IBC).

*IRC 2015/2018 Section R312.1.2  
IBC 2015/2018 Section 1015.3*

### Load Resistance

- Guards and handrails shall be able to resist a single concentrated load of 200 lb., applied in any direction at any point along the top.

*IRC 2015/2018 Table R301.5  
IBC 2015/2018 Section 1607.8.1  
(one- and two-family dwellings)*

- Handrails and guards shall be designed to resist a linear load of 50 pounds per linear foot.

*IBC 2018 Section 1607.8.1  
(not required for one- and two-family dwellings)*

**Note:** The HTT4 may also be used to secure 42" guard posts with 2x10 (min.) deck joists.

For more information on connecting posts inside the rim joist using the DTT2 or HTT4, see Simpson Strong-Tie technical bulletin T-C-GRDRLPST.

# Guard Post to Deck Framing – Fastener Details

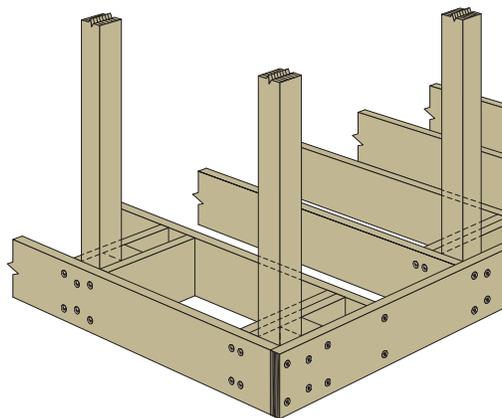
## For 36"- and 42"-Tall Guard Posts

As an alternative code-compliant solution for attaching wood guard posts without the use of typical hardware and through-bolts, the guard posts and the framing elements can be fastened with Strong-Drive® SDWS Timber screws. The SDWS Timber screws are code report listed in IAPMO UES ER-192. The solutions below have been tested and verified for 36"-tall guard posts constructed with DFL, HF and SP framing. These solutions have also been tested and verified for 42"-tall guard posts constructed with DFL and SP framing only. For more information, please refer to T-F-GRDPSTRL18.

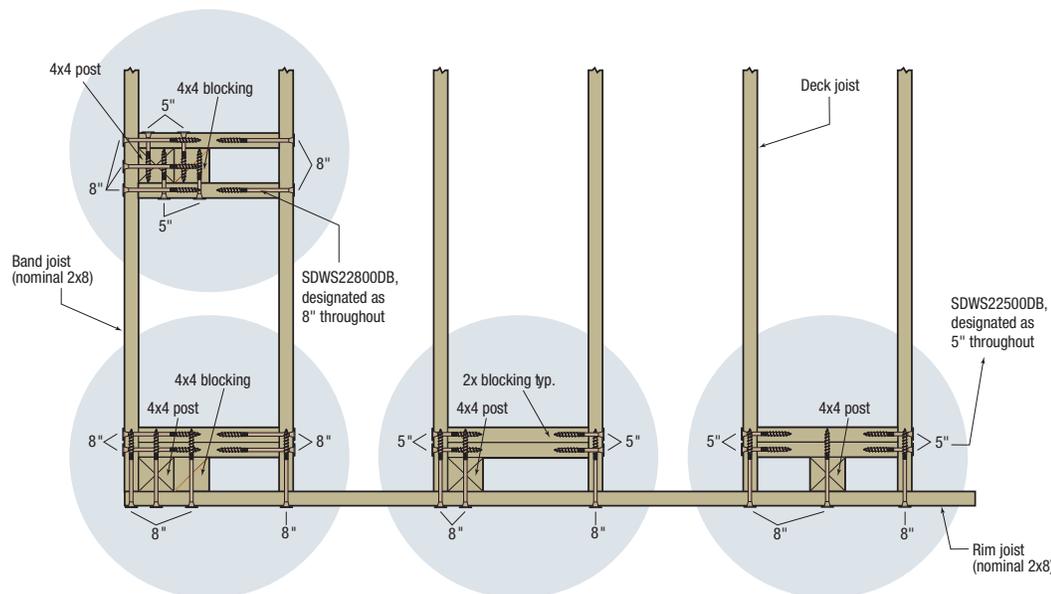


**Strong-Drive SDWS TIMBER Screw**  
(5": SDWS22500DB, 8": SDWS22800DB)

**Note:** For this installation, it is imperative that only approved fasteners are used and installed per Simpson Strong-Tie details. Test results have shown that generic fasteners do not provide sufficient withdrawal resistance, pull-through resistance or shear strength.

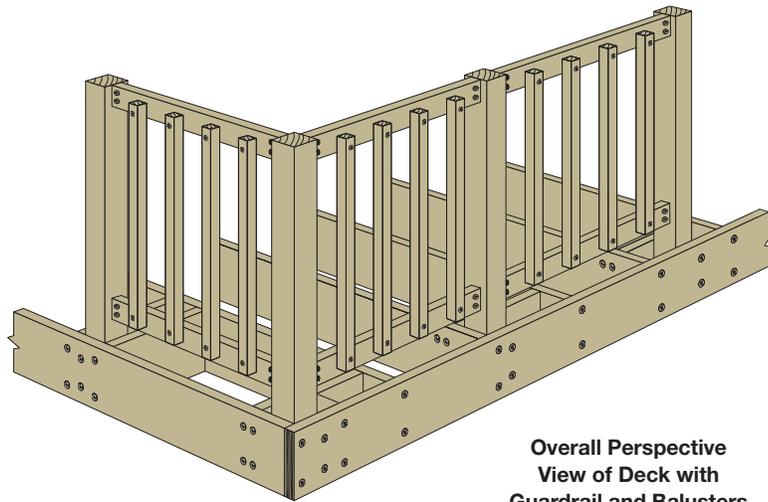


**Internal Guard Post Installations Using Strong-Drive SDWS Timber Screws**



**Plan View Showing Details of Four Connections Using Strong-Drive SDWS Timber Screws**  
(other connection hardware not shown for clarity)

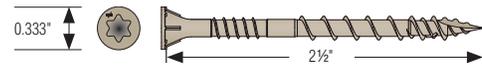
# Guardrail Infill Component Connections



Code compliant fastener solutions for guardrail-to-post and baluster-to-rail assemblies use Strong-Drive® SDWS Framing screws, Deck-Drive™ DSV Wood screws and Deck-Drive DWP Wood SS screws, as described in this section. For more information, please refer to T-F-GRDPSTRL18.



**Strong-Drive SDWS FRAMING Screw**



**Deck-Drive DSV WOOD Screw**

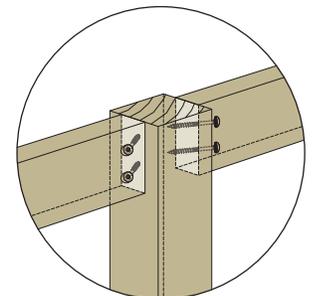
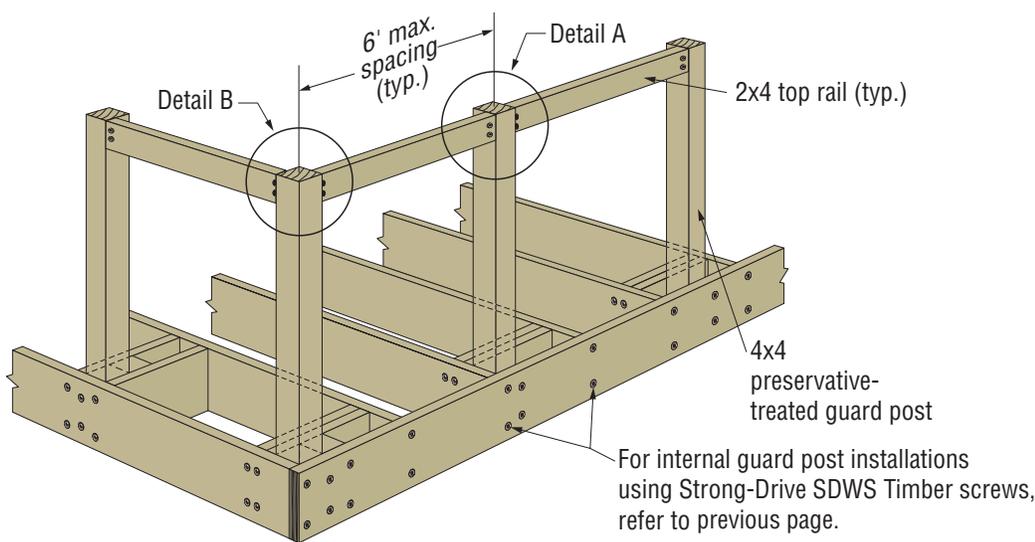


**Deck-Drive DWP WOOD SS Screw**

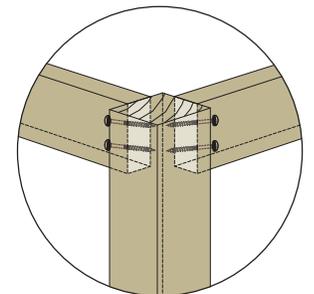
## Guardrail Installations Code-Compliant Guardrail Connection Details

### Installation scope:

- Maximum guard post spacing of 6'
- Nominal 2x4 top and bottom guardrail (AWC, DCA6)
- Nominal 4x4 guard post, min. specific gravity 0.42; min. guardrail specific gravity 0.36



**Detail A: Rail-to-Post Perspective View**



**Detail B: Perspective View**

# Guardrail Infill Component Connections

## Building Code Requirements

### When required

- Guards shall be located along open-sided walking surfaces, including stairs, ramps and landings, that are located more than 30" measured vertically to the floor or grade below at any point within 36" horizontally to the edge of the open side.

*IRC 2015/2018 Section R312.1.1*  
*IBC 2015/2018 Section 1015.2*

### Height

- Guards shall be a minimum of 36" tall (IRC) or up to 42" tall for certain occupancies (IBC).

*IRC 2015/2018 Section R312.1.2*  
*IBC 2015/2018 Section 1015.3*

### Load Resistance

- Guards and handrails shall be able to resist a single concentrated load of 200 lb., applied in any direction at any point along the top.

*IRC 2015/2018 Table R301.5*  
*IBC 2015/2018 Section 1015.3*

- Handrails and guards shall be designed to resist a load of 50 pounds per linear foot.

*IBC 2018 Section 1607.8.1*  
*(not required for one- and two-family dwellings)*

- Guardrail infill components shall withstand a horizontal load of 50 lb. over an area of 1 square foot.

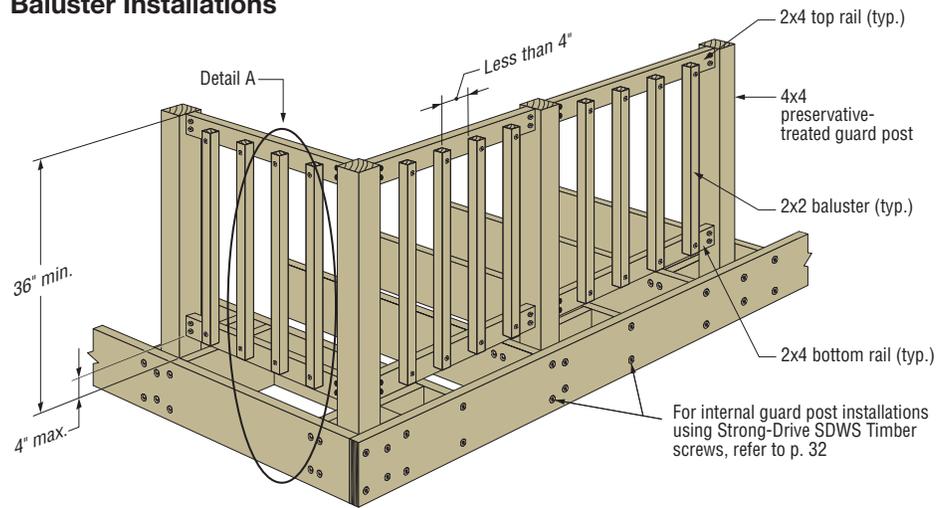
*IRC 2015/2018 Table R301.5*

### Opening Limitations

- Required guardrail infill shall not have an opening that allows passage of a sphere 4" in diameter.

*IRC 2015/2018 Section R312.1.3*

## Baluster Installations



Overall Perspective View of Deck with Baluster Detail

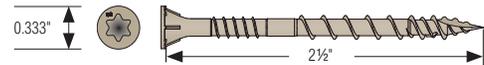
## Code-Compliant Baluster Connection Details

### Installation scope:

- Maximum guard post spacing of 6"
- Nominal 2x4 top and bottom guardrail (AWC, DCA6)
- Nominal 4x4 guard post, min. specific gravity 0.42; min. guardrail specific gravity 0.36



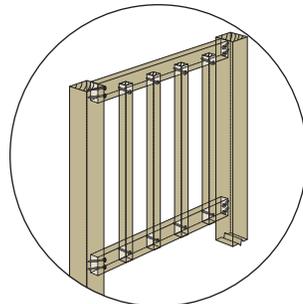
Strong-Drive SDWS FRAMING Screw



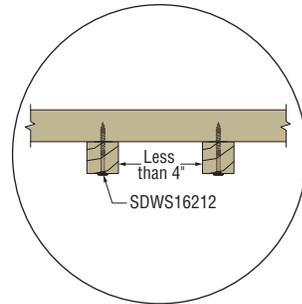
Deck-Drive DSV WOOD Screw



Deck-Drive DWP WOOD SS Screw

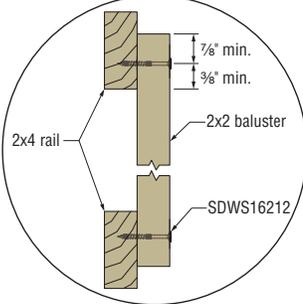


Baluster Perspective View



Detail A: Baluster Plan View

(SDWS16212 listed, DSVT212, S08250WP similar)



Detail B: Baluster Elevation View (Side)  
(SDWS16212 listed, DSVT212, S08250WP similar)

1. Fasten screws into 2x2 baluster, on center, 7/8" from each end of baluster into 2x4 top and bottom rails with SDWS16212 screws.

# Stair Stringers and Treads

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.



## Building Code Requirements

### Stair Stringer to Rim Joist

- Stairs must be able to resist 40 pounds per square foot of tread area in one and two family dwellings. All other stairs under IBC require a design to 100 psf.

*IRC 2015/2018 Table R301.5  
IBC 2015/2018 Table 1607.1*

### 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 2015/2018 Table R301.5  
IBC 2015/2018 Table 1607.1*

### Guard Opening Limitations

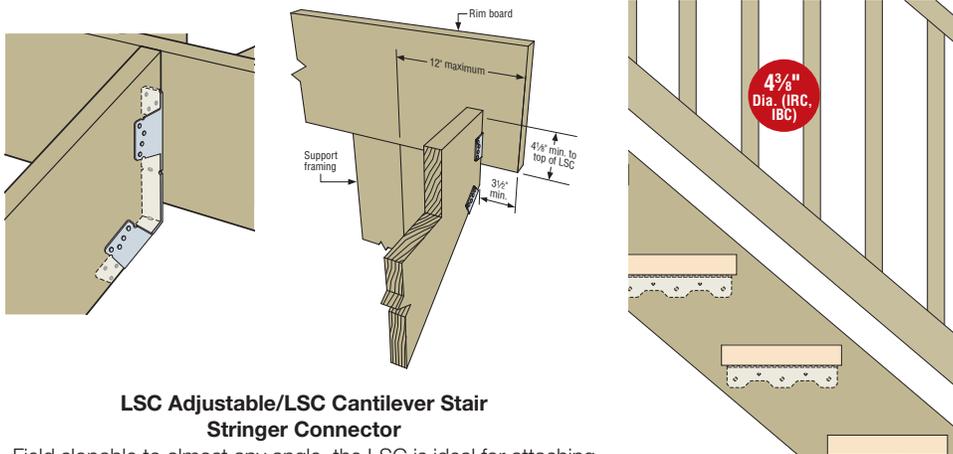
- The triangular opening formed by the riser, tread and bottom rail of a guard at the open side of a stairway shall be of such a size that a sphere 6" in diameter cannot pass through.

*IRC 2015/2018 Section R312.1.3  
IBC 2015/2018 Section 1015.4*

Additional IRC Exception: Openings for required guards on the sides of stair treads shall not allow a sphere 4 3/8" in diameter to pass through.

*IRC 2015/2018 Section R312.1.3*

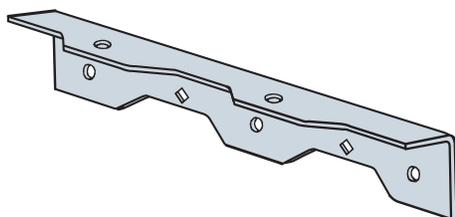
## Simpson Strong-Tie® Solutions



### LSC Adjustable/LSC Cantilever Stair Stringer Connector

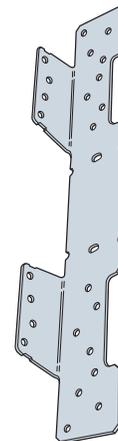
Field slopable to almost any angle, the LSC is ideal for attaching the staircase stringer to the deck. Suitable for solid and notched stringers. ZMAX® coating or stainless steel required. For information regarding notched stringer attachment to full-width stringers, see L-F-DCA6SCREW.

Codes require that a 4 3/8", sphere must not be able to pass between any guard opening at stairs.



### TA Tread 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. ZMAX coating or stainless steel required.



**LSCZ/LCSS**

# Performance Fasteners for Decks

# Structural Wood Fastening

## Structural Wood-to-Wood and Engineered Wood Connections

Simpson Strong-Tie® Strong-Drive® structural screws make high-strength wood-to-wood and engineered wood connections easier and stronger. Designed for both ease of installation and superior strength, these versatile screws are a time-saving alternative to multiple smaller fasteners, lag screws or bolts that require predrilling.

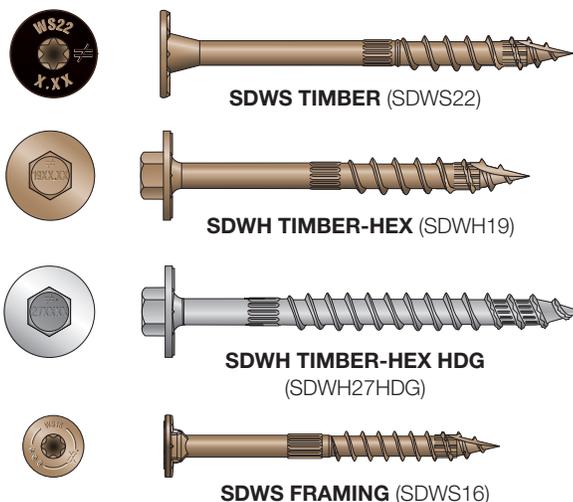
### Strong-Drive SDWS FRAMING, SDWS TIMBER and SDWH TIMBER-HEX Structural Wood Screw

The Simpson Strong-Tie Strong-Drive SDWS Timber, SDWH Timber-Hex and SDWH Timber-Hex HDG wood screws are designed to provide an easy-to-install, high-strength alternative to through-bolting and traditional lag screws. These structural screws are ideal for the contractor and do-it-yourselfer alike, and are available in materials and coatings for various levels of corrosion resistance to match your installation environment.

#### Features:

- Bold thread design that provides superior holding power
- Quik Guard® Double-barrier coating (SDWS and SDWH) and hot-dip galvanized (SDWH HDG)
- Patented SawTooth™ points that ensure fast starts, reduce installation torque and eliminate the need for predrilling in most applications
- Underhead nibs that offer greater installer control when seating the head
- Large washer head provides maximum bearing area

**Codes/Standards:** IAPMO UES ER-192



### Strong-Drive SDWS TIMBER SS Screw

The Strong-Drive SDWS Timber SS heavy-duty structural fastener in severe corrosion-resistant Type 316 stainless steel, has a 0.276"-diameter shank, SawTooth™ point and flat washer head and is designed as a lag screw replacement in applications where severe-corrosion resistance is critical.

#### Features:

- Patented SawTooth point for fast starts and less driving torque — without predrilling
- Large 0.650"-diameter flat washer head with nibs provides load-bearing area and seats flush with surface
- Deep T50, 6-lobe recess for secure driving
- Type 316 stainless steel provides corrosion resistance even in severe conditions
- Mid-shaft knurl aids in torque reduction

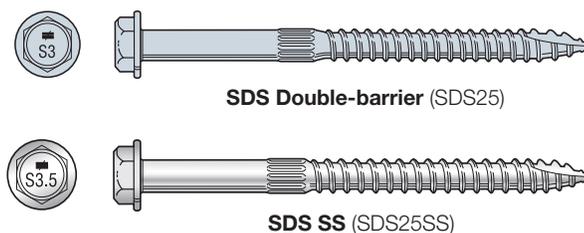


### Strong-Drive SDS HEAVY-DUTY CONNECTOR Screw

The Simpson Strong-Tie Strong-Drive SDS Heavy-Duty Connector screw is a 1/4"-diameter high-strength structural screw ideal for various connector installations as well as wood-to-wood and engineered wood applications.

#### Features:

- Available with a double-barrier coating or in Type 316 stainless steel
- Type 17 points enable easy driving with no predrilling and minimal splitting
- Double-barrier coating provides corrosion resistance equivalent to hot-dip galvanization
- Head is stamped with the Simpson Strong-Tie "≠" sign and fastener length for easy identification after installation



**Codes/Standards:** ICC-ES ESR-2236

# Corrosion-Resistant Fasteners for Decking

## Building Code Requirements

- Wood decking shall be attached to each supporting member with not less than (2) 8d threaded nails or (2) No. 8 wood screws.

*IRC 2018 Section R507.7*

Experience has shown that #7 stainless steel screws are acceptable for face screw fastening of wood and composite deck boards.

### Fastening for composite decking or using concealed fasteners:

*IRC 2015 R507.3, R507.3.5;  
IRC 2018 Sections R507.2.2,  
507.2.2.5*

Wood Plastic Composite deck boards shall be installed in accordance with the manufacturer's instructions and shall comply with the requirements of ASTM D7032 Section 5.6 Mechanical Fastener Holding Tests for the use of concealed clips. Simpson Strong-Tie recommends consulting with the decking manufacturer for their recommendations.



Stainless-steel connectors are also available for high and severe exposure environments or applications using certain preservative-treated woods. See pp. 49–50 for more detail.



Simpson Strong-Tie offers a variety of premium solutions for fastening wood, PVC or composite decking. Our fasteners are designed specifically to perform in their target decking material, and many of our fasteners are available in colors to provide a fastening solution that blends with the deck surface.

## Stainless-Steel Screws

### Deck-Drive™ DWP WOOD SS Screw

For the majority of wood deck boards



### Strong-Drive® DWP WOOD SS Screw

For structural applications on decks



### Bugle-Head Wood Screw

For all types of wood decking including cedar, redwood and preservative-treated woods (non-hardwood). Bugle-Head Wood screws are available in both square and 6-lobe drive recesses.



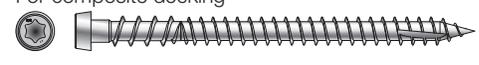
### Trim-Head Screw — 6-Lobe Drive

For wood decking and PVC decking materials



### Deck-Drive DCU COMPOSITE SS Screw

For composite decking



Also available with color-matching painted heads

### Deck-Drive DHPD HARDWOOD Screw

For hardwood decking materials



## Exterior-Grade Screws

### Deck-Drive DSV WOOD Screw

For preservative-treated wood



### Deck-Drive DCU COMPOSITE Screw

For composite decking



Available in a variety of color-matching painted options. See p. 41

## Load-Rated Deck Board Fasteners

### Strong-Drive DWP WOOD SS Screw

Sizes: #12 and #14. For wood in high and severe corrosion environments. For more information, see C-F-2019TECHSUP



### Deck-Drive DCU COMPOSITE Screw

For composite/PVC decking. For more information, see L-F-DCUUP/LIFT



Available in a variety of color-matching painted options. See p. 41

### Deck-Drive DSV WOOD Screw

Size: #10. For preservative-treated decking applications in medium corrosion environments. For more information, see C-F-DSVLOAD19.



For more information on fasteners, please visit [strongtie.com/fastenerfinder](http://strongtie.com/fastenerfinder).

# Corrosion-Resistant Fasteners for Decking

## Stainless-Steel Nails

### Hand-Drive Decking and Trim Nails



### 15° Wire Coil, Full Round Checked Head, Ring Shank

Types 304 and 316 Stainless Steel



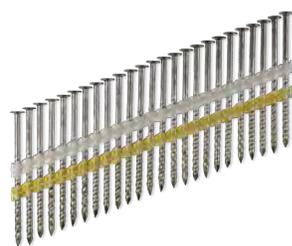
### 20°–22° Plastic Strip, Full Round Checked Head, Ring Shank

Types 304 and 316 Stainless Steel



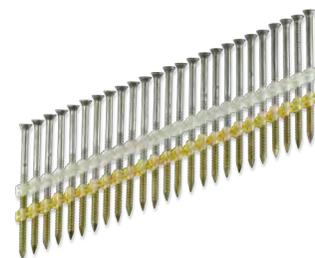
### 20°–22° Plastic Strip, Full Round Smooth Head, Screw Shank

Types 304 and 316 Stainless Steel



### 20°–22° Plastic Strip, Checked, Casing Head, Ring Shank

Type 304 Stainless Steel



### 28° Wire Weld, Clipped Smooth Head, Ring Shank

Type 304 Stainless Steel



### 31°–34° Plastic Strip, Full Round Checked Head, Ring Shank

Types 304 and 316 Stainless Steel



### 31°–34° Paper Tape, Clipped Smooth Head, Ring Shank

Types 304 and 316 Stainless Steel



### Building Code Requirements

- Wood decking shall be attached to each supporting member with not less than (2) 8d threaded nails or (2) No. 8 wood screws.

*IRC 2018 Section R507.7*



Stainless-steel connectors are also available for high and severe exposure environments or applications using certain preservative-treated woods. See pp. 49–50 for more detail.



For more information on fasteners, please visit [strongtie.com/fastenerfinder](http://strongtie.com/fastenerfinder).

# Quik Drive® Auto-Feed Screw Driving Systems for Decks

## Building Code Requirements

- Wood decking shall be attached to each supporting member with not less than (2) 8d threaded nails or (2) No. 8 wood screws.

IRC 2018 Section R507.7

Experience has shown that #7 stainless steel screws are acceptable for face screw fastening of hardwood and composite deck boards.

### Fastening for composite decking or using concealed fasteners:

IRC 2015 R507.3, R507.3.5;  
IRC 2018 Sections R507.2.2, 507.2.2.5

Wood Plastic Composite deck boards shall be installed in accordance with the manufacturer's instructions and shall comply with the requirements of ASTM D7032 Section 5.6 Mechanical Fastener Holding Tests for the use of concealed clips. Simpson Strong-Tie recommends consulting with the decking manufacturer for their recommendations.



Stainless-steel connectors are also available for high and severe exposure environments or applications using certain preservative-treated woods. See pp. 49–50 for more detail.

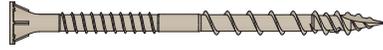


Shown with Deck Clip QDDECKCLIP-RC

Quik Drive auto-feed screw driving systems are ideal for fastening decking because they combine the efficiency of stand-up driving with the holding power of screws, providing the best long-term results.

### Deck-Drive™ DSV WOOD Screw

Rimmed flat head with nibs, Quik Guard® coating in red, tan and gray



### Deck-Drive DHPD HARDWOOD Screw

Paddle-style drill point, Type 305 stainless steel



### Deck-Drive DWP WOOD SS Screw

Flat head with nibs, available in Types 305 and 316 stainless steel



### Trim-Head Screw

#7 trim head, Type 305 stainless steel



### Deck-Drive DCU COMPOSITE Screw

Available with Quik Guard coating in 11 colors or in Types 305 and 316 stainless steel. DCU Composite screws are load rated for uplift resistance. See L-F-DCUPLIFT18.



### Bugle-Head Wood Screw

#10 bugle head, available in Types 305 and 316 stainless steel



## PROSDD/CCS+ Combo System

**Applications:** Decks/docks, subfloor, sheathing, wall plates, stair treads, fiber-cement siding, drywall

- Expanded depth settings for high-density materials
- Reversible and replaceable non-skid teeth
- Uniform toenailing and countersink on slick surfaces
- Two screw driving attachments for added versatility



## PRO300S System

**Applications:** Decks/docks, subfloor, wall plates, stair treads

- Expanded depth settings for high-density materials
- Reversible and replaceable non-skid teeth
- Includes a decking nose clip to position decking screws quickly and precisely every time
- Uniform toenailing and countersink on slick surfaces
- Sure-grip guide tube increases stability for a broad range of screws



# Color-Match Fasteners for Composite and PVC Decking

## Decking Meets Its Match

Simpson Strong-Tie® color-matched hand-drive and collated fasteners are available in a color palette specifically formulated to match a wide range of the most popular decking systems, and are designed to blend into the decking material.

**Trim-Head PVC Decking:** Azek, Cevn, Gossen, Timber Tech, Trex, Veka Deck

**Composite or Encapsulated Decking:** ChoiceDek, Evergrain, Fiberon, Moisture Shield, Timber Tech, Trex

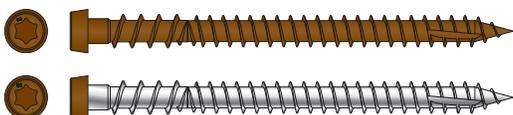
For more information on Simpson Strong-Tie color-match fasteners, please refer to [strongtie.com/colormatchingguide](http://strongtie.com/colormatchingguide).

AZEK, Cevn, ChoiceDek, Evergrain, Fiberon, Gossen, MoistureShield, TimberTech and VekaDeck are trademarks or registered trademarks of their respective holders. Trex and Trex Escapes are registered trademarks of Trex Company, Inc.

## Composite or Encapsulated Composite Decking

### Deck-Drive™ DCU COMPOSITE Screw

- Cap head to reduce mushrooming and conceal installation
- Available in colors to match popular composite deck boards
- Available with Quik Guard® coating and stainless steel
- For more information, see *C-F-2019 Fastening Systems* catalog



## PVC Decking Fasteners

### Trim-Head Screw, Stainless Steel, 6-Lobe Drive

- Trim-style head reduces appearance of installed fasteners on deck surface
- Available in colors formulated to match popular PVC deck systems



## PVC and Composite Fascia Fastening

### Fascia-Fastening Solution

To properly install color-matched fasteners into a PVC fascia board, proper fastener spacing and counter-boring is necessary. The Fascia-Fastening Solution provides the means to accomplish this for a professional finish

- Type 316 stainless steel, color-matching fasteners for 1/2"-3/4" thick fascia boards
- Installs easily with the Fascia Counterbore bit and T20 6-lobe bit



### Deck-Drive™ DCU Screw Plugs

Deck-Drive DCU screw plugs provide a means of concealing the Deck-Drive DCU Composite screw heads used to fasten PVC and composite deck boards. The DCU screw plug solution can be ordered to color-match the deck boards, and comes with countersinking driver bits for hand drive, as well as for Quik Drive® auto-feed screw driving systems.

- For PVC and Composite decks and trim boards
- Made from major manufacturer deck and trim boards



### Building Code Requirements

- Wood decking shall be attached to each supporting member with not less than (2) 8d threaded nails or (2) No. 8 wood screws.
- Wood Plastic Composite deck boards shall be installed in accordance with the manufacturer's instructions and shall comply with the requirements of ASTM D7032 and this section.

IRC 2018 Section R507.7  
2015 Section R507.3, R507.3.5  
2018 Section R507.2.2, R507.2.2.5

Experience has shown that #7 stainless steel screws are acceptable for face screw fastening of wood and composite deck boards.

### Fastening for composite decking or using concealed fasteners:

IRC 2015 R507.3, R507.3.5;  
IRC 2018 Sections R507.2.2, 507.2.2.5



Stainless-steel connectors are also available for high and severe exposure environments or applications using certain preservative-treated woods. See pp. 49-50 for more detail.

**Trex** Deck-Drive DCU Composite screws are approved by Trex for Trex 1" x 6" and 2" x 6" composite decking.

# Hidden Deck Fastening

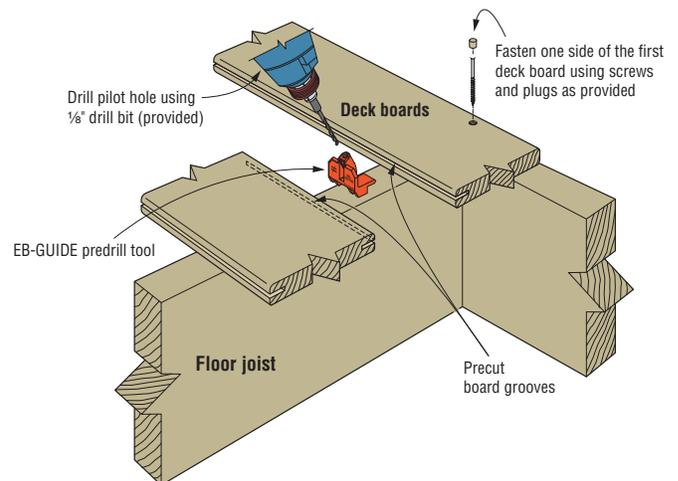
## EB-TY® Premium Hidden-Deck Fastening System™

**For wood decks including exotic hardwoods, redwood and cedar**

The EB-TY Premium Hidden Deck-Fastening System is the ideal solution that blends strength with ease of installation in a fastener that won't detract from the deck's finished appearance. EB-TY Premium integrates a Type 300 series stainless-steel reinforcing plate into its connection biscuit. The plate adds stiffness to hold boards in place securely, yet maintains flexibility when seasonal contraction and expansion occur. The EB-GUIDE predrilling tool helps install EB-TY Premium with precision and ease. Ipê wood plugs included.

### Features:

- Provides greater holding power and increased pullover resistance
- Type 300 series stainless-steel plate ensures lasting durability in demanding environments
- Prevents over-driving of the screw, helping to ensure consistent, quality installations
- Angled screw attachment ensures direct attachment of the board to the joist and prevents board movement
- EB-TY Premium covers the joist to protect it from exposure to sun and rain
- Chamfered edges for easier board alignment and installation of successive boards
- 3/16" and 1/4" spacings offer expansion compensation
- Additional Ipê Wood Plugs can be purchased separately



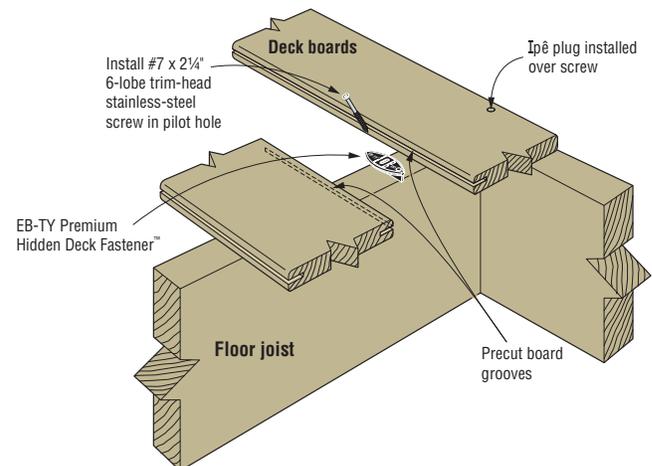
EB332W Series



EB316W Series



EB14W Series



# Fastener Selection Guidance

# Matching Connectors and Fasteners

## Guidelines for Selecting Materials and Coatings

The following pages provide a system for determining which connector and fastener product coatings and base metals to use in a range of corrosion conditions. These are general guidelines that may not consider all relevant application criteria. Also refer to pp. 48-50 and product-specific information for additional guidance.

## The Right Connectors and Fasteners for Your Environment

### Step 1 Choose connectors with the right material/finish for your environment.

Connector Corrosion Resistance	Product Coating/Material	Dry Environment	Wet Environment	Coastal Environment
Low	G90 Galvanized	OK	NO	NO
Medium	ZMAX® / Hot-Dip Galvanized	OK	OK	NO
High/Severe	Stainless Steel (Type 316)	OK	OK	OK

#### Corrosion Environment Types

**Dry Service** Interior applications such as inside wall and ceiling cavities, attics and raised-floor applications in enclosed buildings.

**Wet Service** Exterior applications such as decks, pergolas, covered patios, fences and other structures where connectors or fasteners will get wet due to rain, snow, sprinklers and other condensation. (For coastal or poolside areas, see below.)

**Coastal/Water Front Service** Marine environments that include airborne chlorides, salt air and some salt splash. Environments with de-icing salts are included.

- For applications involving ACZA preservative-treated or fire-resistant lumber, use a material or coating in the medium-resistance category.
- For applications where the service environment is uncertain, or corrosion potential is elevated by the presence of fumes, fertilizers, chlorine, soil, some preservative-treated wood, acid rain, salt air and other chemicals and corrosive elements, stainless steel is recommended.
- Wet service includes wood with preservative treatments as described by AWPA for Exterior Protected and Exposed (UC3A and UC3B) and General Use Ground Contact (UC4A).

### Step 2 Choose the fastener material/coating that matches your connector.

Connector Corrosion Resistance	Product Coating/Material	Fastener Coating/Material	Simpson Strong-Tie Fastener
Low	G90 Galvanized	Bright nails	—
		Zinc-plated screws	SD8 wafer-head screws (interior non-structural products only)
Medium	ZMAX® / Hot-Dip Galvanized	Hot-dip galvanized nails (ASTM A153, Class D)	Strong-Drive® SCN nail
		Mechanically galvanized	Strong-Drive SD CONNECTOR screw
		Double-barrier coating Quik Guard® coating	Strong-Drive SDS HEAVY-DUTY CONNECTOR screw Outdoor Accents® connector/structural wood screws
High/Severe	Stainless Steel (Type 316)	Stainless steel (Type 316)	Strong-Drive SCNR nail
			Strong-Drive SDS CONNECTOR screw stainless steel

**Remember** Always use the correct type, diameter and length of fastener that is specified for the connector. For more information, visit [strongtie.com](http://strongtie.com).



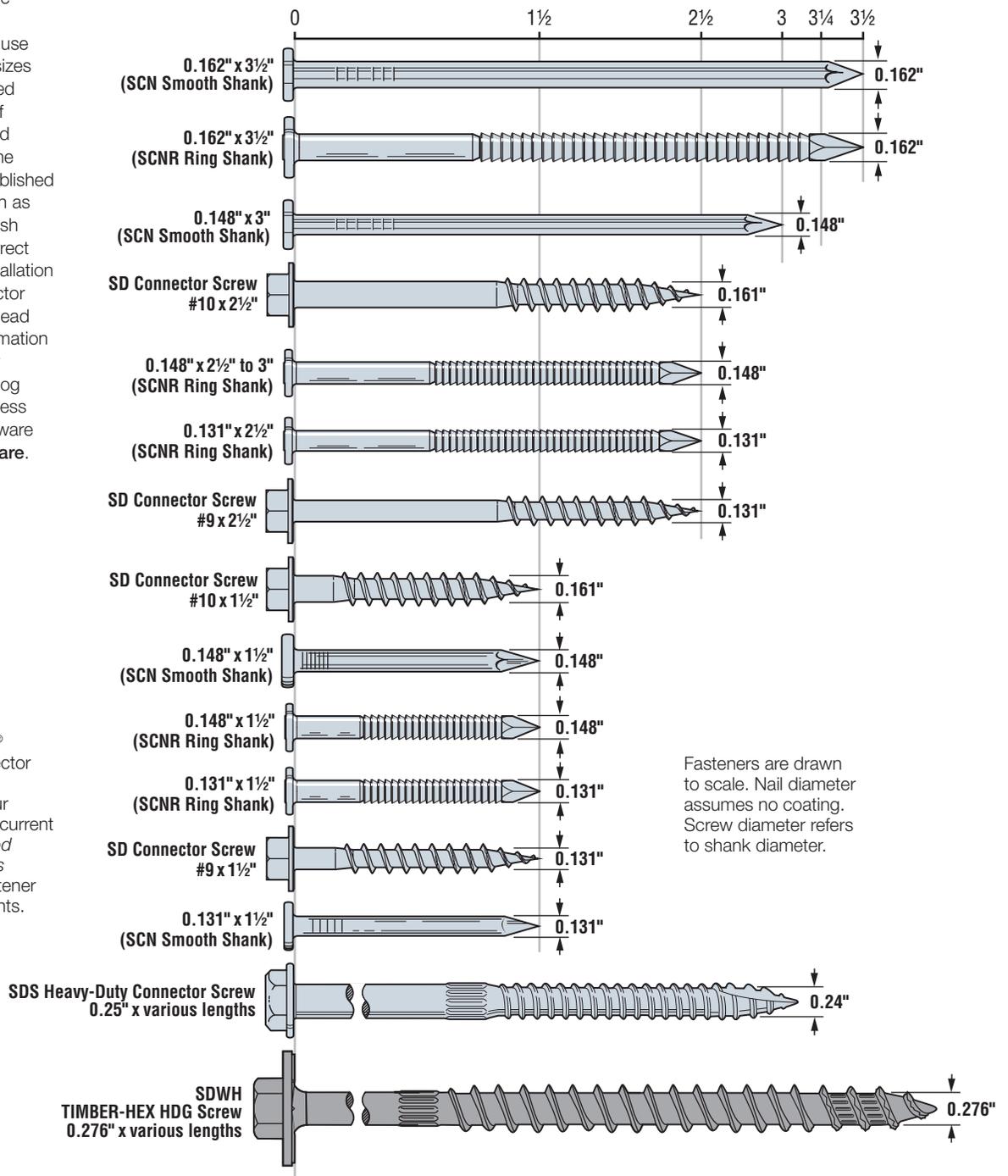
# Connector Fastener Types

Many Simpson Strong-Tie connectors have been designed and tested for use with specific types and sizes of fasteners. The specified quantity, type and size of fastener must be installed in the correct holes on the connector to achieve published loads. Other factors such as fastener material and finish are also important. Incorrect fastener selection or installation can compromise connector performance and could lead to failure. For more information about fasteners, see our *Fastening Systems* catalog at [strongtie.com](http://strongtie.com) or access our Fastener Finder software at [strongtie.com/software](http://strongtie.com/software).



The Simpson Strong-Tie® Strong-Drive® SD Connector screw is the only screw approved for use with our connectors. Consult the current Simpson Strong-Tie *Wood Construction Connectors* catalog for complete fastener and fastening requirements.

The allowable loads of stainless-steel connectors match those of carbon-steel connectors when installed with Simpson Strong-Tie® stainless-steel, SCNR ring-shank nails. For more information, refer to C-F-2019TECHSUP page 135 at [strongtie.com](http://strongtie.com).



Fasteners are drawn to scale. Nail diameter assumes no coating. Screw diameter refers to shank diameter.

# Fastener Information

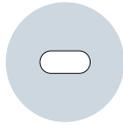
## Fastening Identification



### Round Holes

**Purpose:** To fasten a connector.

**Fill Requirements:** Always fill, unless noted otherwise.



### Obround Holes

**Purpose:** To make fastening a connector in a tight location easier.

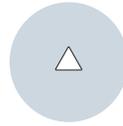
**Fill Requirements:** Always fill, unless noted otherwise.



### Hexagonal Holes

**Purpose:** To fasten a connector to concrete or masonry.

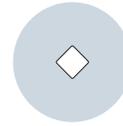
**Fill Requirements:** Always fill when fastening a connector to concrete or masonry.



### Triangular Holes

**Purpose:** To increase a connector's strength or to achieve max. strength.

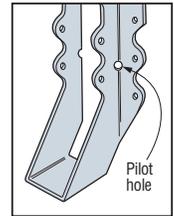
**Fill Requirements:** When the designer specifies maximum nailing.



### Diamond Holes

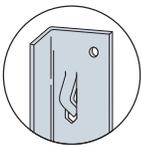
**Purpose:** To temporarily fasten a connector to make installing it easier.

**Fill Requirements:** None.



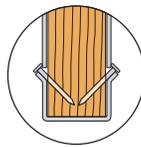
### Pilot Holes

Tooling holes for manufacturing purposes. No fasteners required.



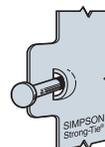
### Speed Prongs

Used to temporarily position and secure the connector for easier and faster installation.



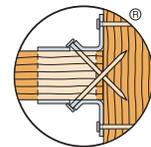
### Positive Angle Nailing (PAN)

Provided when wood splitting may occur, and to speed installation.



### Dome Nailing

This feature guides the nail into the joist and header at a 45° angle.



### Double-Shear Nailing

The nail is installed into the joist and header, distributing the load through two points on each joist nail for greater strength. Double-shear nailing must be full-length catalog nail.

## Incorrect Applications

### Short Nails

Do not use short (1 1/2") nails for double-shear nailing.



Double-shear nailing shall use minimum 2 1/2" long nail or SD Connector screws.



Shorter nails shall not be used as double-shear nails.

### Power Nailing

Collated framing-nailer fasteners can only be used if:

1. Correct diameter and length are installed
2. Correct material or finish is installed
3. Correct quantity is installed
4. Nails are driven with a hole-locating tool (finds the hole) or by hand
5. A full, round concentric head is required

### NOTE:

- Nails with 0.131" diameter may not be used to replace 10d common or 16d sinker nails
- Do not overdrive
- Drive only through punched holes

Power-driven nails must meet ASTM A153 Class D or equivalent specification for ZMAX® or hot-dip galvanized applications. As most framing nails are only zinc-plated, please ensure that the nails used with ZMAX connectors are hot-dip galvanized to meet ASTM A153.

Consult the current Simpson Strong-Tie *Wood Construction Connectors* catalog for complete fastener and fastening requirements.

# Mitigating Corrosion Risk

# Selecting Connector and Fastener Coatings

## Corrosion Issues

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

Connectors and fasteners are exposed to the weather and often treatment chemicals in outdoor environments leading to an increased corrosion hazard. If building a deck in an area especially prone to moisture, such as 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 Strong-Tie® ZMAX® coated (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, SDS screws with a double-barrier coating, or SD screws with a mechanically galvanized coating.

For high and severe corrosion applications, stainless-steel connectors and fasteners offer the best defense against corrosion. Simpson Strong-Tie offers a variety of connectors and fasteners in stainless steel for deck construction.

For more information on corrosion and selecting the appropriate finish for your application, visit [strongtie.com/info](http://strongtie.com/info).

## The Science Behind Stainless Steel

Simpson Strong-Tie connectors are available in 316 stainless steel, and Simpson Strong-Tie fasteners are available in either 316 or 304/305 stainless steel. Type 300 Series stainless steels contain chromium that is activated on the surface as chromium oxide and protects the base metal from corrosive attack. Type 316 stainless steel contains molybdenum, which increases corrosion resistance in chloride-containing exposures, such as saltwater environments.

### Common Conditions That Can Affect Corrosion Resistance of Metal Connectors and Fasteners

- Ocean salt air
- Water
- Preservative-treated wood
- Fire retardant-treated wood
- Salt used to de-ice or melt snow
- Pool or hot-tub chemicals
- Fertilizers
- Soil
- Industrial zones
- Concrete
- Weather exposure

### *Always Use Stainless-Steel Fasteners with Stainless-Steel Connectors*

Go to [strongtie.com](http://strongtie.com) for more information regarding stainless-steel fasteners and connectors.



**Dry Service**



**Wet Service**



**High/Severe**

# Corrosion Information

## Corrosion Resistance Classifications

Environment	Material to Be Fastened						
	Untreated Wood or Other Material	Preservative-Treated Wood					FRT Wood
		SBX-DOT Zinc Borate	Chemical Retention ≤ AWPA, UC4A	Chemical Retention > AWPA, UC4A	ACZA	Other or Uncertain	
Dry Service	Low	Low	Low	High	Medium	High	Medium
Wet Service	Medium	N/A	Medium	High	High	High	High
Elevated Service	High	N/A	Severe	Severe	High	Severe	N/A
Uncertain	High	High	High	Severe	High	Severe	Severe
Ocean/Water Front	Severe	N/A	Severe	Severe	Severe	Severe	N/A

- Always consider the importance of the connection as well as the cost of maintenance and replacement.
- If the information about treatment chemicals in an application is incomplete, or if there is any uncertainty as to the service environment of any application, Simpson Strong-Tie recommends the use of a Type 300 Series stainless steel. Simpson Strong-Tie has evaluated the corrosion effects of various formulations of wood treatment chemicals ACZA, ACQ, CCA, MCA, CA, and salt as corrosion accelerators. Simpson Strong-Tie has not evaluated all formulations and retentions of the named wood treatment chemicals other than to use coatings and materials in the severe category. Manufacturers may independently provide test results or other product information. Simpson Strong-Tie expresses no opinion regarding such information.
- Type 316/305/304 stainless-steel products are recommended where preservative-treated wood used in ground contact has a chemical retention level greater than those for AWPA UC4A; CA-C, 0.15 pcf; CA-B, 0.21 pcf; micronized CA-C, 0.14 pcf; micronized CA-B, 0.15 pcf; ACQ-Type D (or C), 0.40 pcf. When wood treated with micronized CA-C and micronized CA-B with treatment retentions up to UC4B is in dry service, hot-dip galvanized fasteners and connectors may be suitable.
- Mechanical galvanizations C3 and N2000 should not be used in conditions that would be more corrosive than AWPA UC3A (exterior, above ground, rapid water run off).
- Some chemically treated wood may have chemical retentions greater than specification, particularly near the surface, making it potentially more corrosive than chemically treated wood with lower retentions. If this condition is suspected, use Type 316/305/304 stainless-steel, silicon bronze, or copper fasteners.
- Some woods, such as cedars, redwood, and oak, contain water-soluble tannins and are susceptible to staining when in contact with metal connectors and fasteners. According to the California Redwood Association ([calredwood.org](http://calredwood.org)), applying a quality finish to all surfaces of the wood prior to installation can help reduce staining.
- Anchors, fasteners and connectors in contact with FRT (fire retardant treated) lumber shall be hot-dip galvanized or stainless steel, unless recommended otherwise by the FRT manufacturer. Many FRT manufacturers permit low-corrosion-resistant connector and fastener coatings for dry-service conditions.
- Simpson Strong-Tie does not recommend painting stainless-steel anchors, fasteners or connectors. Imperfections or damage to the paint can facilitate collection of dirt and water that can degrade or block the passive formation of the protective chromium oxide film. When this happens, crevice corrosion can initiate and eventually become visible as a brown stain or red rust. Painting usually does not improve the corrosion resistance of stainless steel.

## Coatings and Materials Available

Level of Corrosion Resistance	Coating or Material	Description	Fastener Material or Finish
<b>Connectors</b>			
Low	<b>Gray Paint</b>	Organic paint intended to protect the product while it is warehoused and in transit to the jobsite.	Bright, Hot-Dip Galvanized, Mechanically Galvanized, or Double-Barrier Coating
	<b>Powder Coating</b>	Baked-on paint finish that is more durable than standard paint.	
	<b>Galvanized</b>	Standard (G90) zinc-galvanized coating containing 0.90 oz. of zinc per square foot of surface area (total both sides).	
Medium		Galvanized (G185) 1.85 oz. of zinc per square foot of surface area (hot-dip galvanized per ASTM A653) total for both sides. Products with a powder-coat finish over a ZMAX® base have the same level of corrosion resistance.	Hot-Dip Galvanized, Mechanically Galvanized, or Double-Barrier Coating <i>* Bright fasteners may be used with ZMAX or HDG connectors where low corrosion resistance is allowed.</i>
		Products are hot-dip galvanized after fabrication (14 ga. and thicker). The coating weight increases with material thickness. The minimum average coating weight is 2.0 oz./ft. <sup>2</sup> (per ASTM A123) total for both sides. Anchor bolts are hot-dip galvanized per ASTM F2329.	
High/Severe	 <b>Type 316 Stainless Steel</b>	Type 316 stainless steel is a nickel-chromium austenitic grade of stainless steel with 2-3% molybdenum. Type 316 stainless steel is not hardened by heat treatment and is inherently nonmagnetic. It provides a level of corrosion protection suitable for severe environments, especially environments with chlorides.	Type 316 Stainless Steel

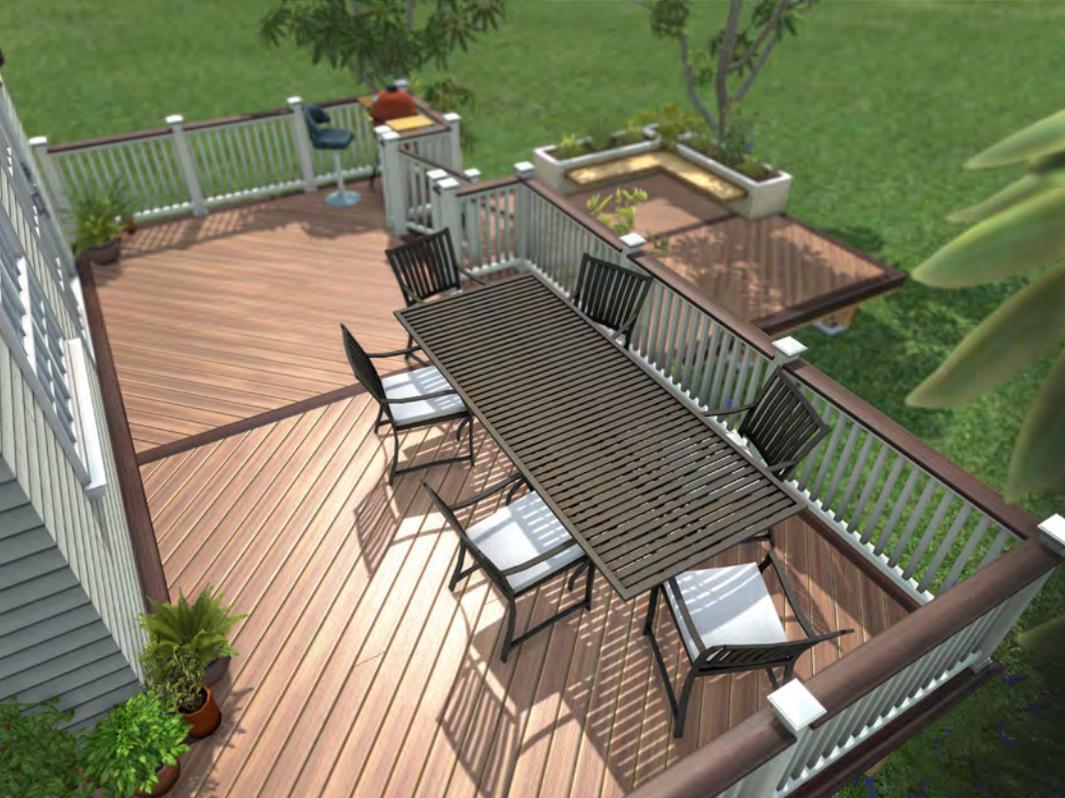
# Corrosion Information

## Coatings and Materials Available

Level of Corrosion Resistance	Coating or Material	Description	Applicable Products
<b>Fasteners and Anchors</b>			
Low	Bright	No surface coating.	Nails
	Electrocoating (E-Coat™)	Electrocoating utilizes electrical current to deposit the coating material on the fastener. After application, the coating is cured in an oven. Electrocoating provides a minimum amount of corrosion protection and is recommended for dry, low-corrosive applications.	Strong-Drive® SDWF SDW and SDVV screws
	Clear, Yellow, and Bright Zinc, ASTM F1941	Zinc coatings applied by electrogalvanizing processes to fasteners that are used in dry service and with no environmental or material corrosion hazard.	SD8 Wafer Head Screw
	Phosphate (gray/black)	Gray phosphate provides a minimum level of corrosion resistance and is intended for dry, low corrosion applications. Black phosphate provides a minimum level of corrosion resistance and is intended for dry, low corrosion applications.	
	Type 410 Stainless Steel	Type 410 stainless steel is a low-carbon martensitic grade of stainless steel that can be hardened and is inherently magnetic. This material provides corrosion resistance in mild atmospheres and many mild chemical environments.	
	Heavy Electro-Galvanized (ASTM A641 - Class 1)	Electroplated zinc applied in accordance with ASTM A641, Class 1. This is an electroplated zinc coating that provides a low level of corrosion resistance. The Class 1 coating has no specified red rust performance criteria in the B117 salt spray test.	
Medium	 <b>ASTM A153, Class D</b>	Hot-dip galvanized fasteners 3/8" and smaller in diameter in accordance with ASTM A153, Class D. Hot-dip galvanized fasteners are compliant with the 2015 and 2018 IRC and IBC.	Strong-Drive SCN Nail
	Type 410 Stainless Steel with Protective Top Coat	Carbon martensitic grade of stainless steel that is inherently magnetic, with an added protective top coat. This material can be used in mild atmospheres and many mild chemical environments.	Titen® Stainless-Steel Concrete and Masonry Screw
	Mechanically Galvanized Coating, ASTM B695, Class 55	Simpson Strong-Tie® Strong-Drive SD Connector screws are manufactured with a mechanically applied zinc coating in accordance with ASTM B695, Class 55, with a supplemental overcoat. These fasteners are compatible with painted and zinc-coated (G90 and ZMAX) connectors and are recognized in evaluation reports that can be found on <a href="http://strongtie.com">strongtie.com</a> .	Strong-Drive SD CONNECTOR Screw
	Quik Guard® Coating	Quik Guard is a proprietary coating that consists of an electroplated zinc base layer and a system of organic top coats.	Strong-Drive SDWS FRAMING Screw Deck-Drive DSV WOOD Screw Deck-Drive DCU COMPOSITE Screw
	Double-Barrier Coating	Simpson Strong-Tie Strong-Drive SDS Heavy-Duty Connector screws and Outdoor Accents® structural wood screws are manufactured with double-barrier coating that provides a level of corrosion protection equaling that provided by HDG coating and are recognized in evaluation reports that can be found on <a href="http://strongtie.com">strongtie.com</a> .	Strong-Drive SDS CONNECTOR Screw Outdoor Accents Connector Screw and Structural Wood Screw
High/ Severe	 <b>ASTM A153, Class C</b>	Simpson Strong-Tie Strong-Drive Timber-Hex screws are hot-dip galvanized in accordance with ASTM A153, Class C. These hot-dip galvanized fasteners have a minimum average of 1.25 oz./ft. <sup>2</sup> of zinc coating and are compliant with the 2015 and 2018 IRC (R317.3) and IBC.	Strong-Drive TIMBER-HEX HDG Screw
	 <b>Type 316 Stainless Steel</b>	Type 316 stainless steel is a nickel-chromium austenitic grade of stainless steel with 2-3% molybdenum. It provides a level of corrosion protection suitable for severe environments, especially environments with chlorides. Type 316 stainless-steel fasteners are compliant with the 2015 and 2018 IBC and IRC.	Strong-Drive SDWS TIMBER SS screw Deck-Drive DWP WOOD SS Screw Deck-Drive DCU COMPOSITE Screw Strong-Drive SCNR Nail Strong-Drive SDS CONNECTOR Screw
	<b>Type 304 Stainless, Type 305 Stainless</b>	Types 304 and 305 stainless steels are nickel-chromium austenitic grades of stainless steel. Types 304 and 305 stainless steels are not hardened by heat treatment and are inherently nonmagnetic.	Strong-Drive SDS CONNECTOR Screw Deck-Drive DWP WOOD SS Screw



# Inspire backyard transformations.



The best vacation spot can be your own backyard. Inspire your clients to create an outdoor getaway with deck software that provides impressive 3D visuals along with all the back-end data — live dimensions, structural hardware, materials lists — to build a safe and beautiful deck.

With the Deck Planner Software™, deck plans are faster and easier than ever. Visit [go.strongtie.com/deckplanner](http://go.strongtie.com/deckplanner).



*Outdoor Accents®*

# Easy on the eyes. Easy to install.



Hangers



Gable Plates



Ties



Fasteners



Post Bases



Angles



Straps

## Outdoor Accents decorative hardware.

Your customers can easily add beauty and strength to their outdoor projects. The Simpson Strong-Tie® Outdoor Accents line of structural connectors features an innovative screw and washer that together combine the ease of installing a screw with the look of a bolt. And, with a black powder-coat finish, this hardware offers style that's designed to last.

To see our full line of decorative hardware, visit us at [go.strongtie.com/outdooraccents](http://go.strongtie.com/outdooraccents).

**SIMPSON**  
**Strong-Tie**

®

This flier is effective until December 31, 2021, and reflects information available as of December 1, 2019. This information is updated periodically and should not be relied upon after December 31, 2021. Contact Simpson Strong-Tie for current information and limited warranty or see [strongtie.com](http://strongtie.com).