

Deck Connection and Fastening Guide



DG-EU-2020

Build a Safe, Strong Deck

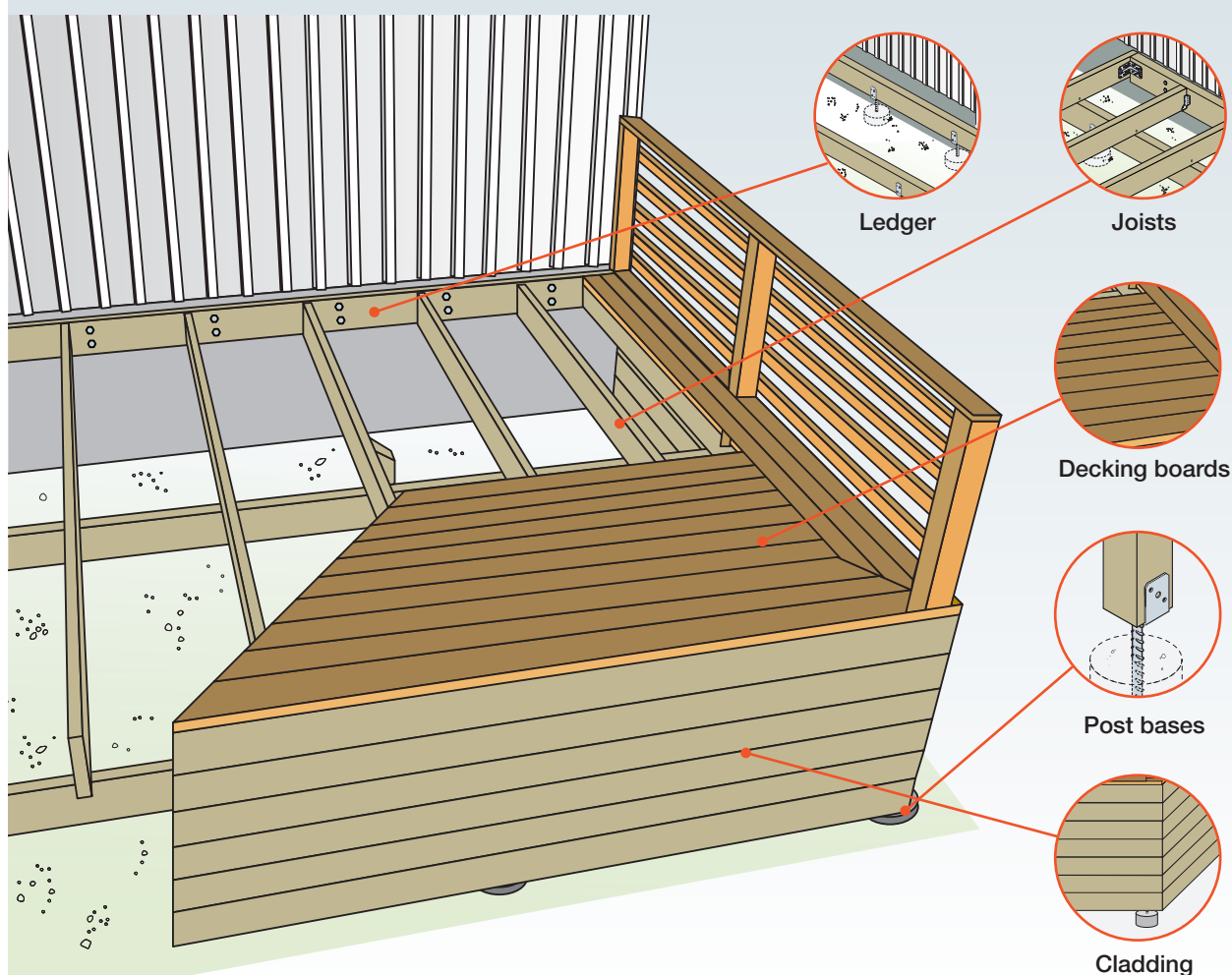
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Welcome to the Simpson Strong-Tie decking guide

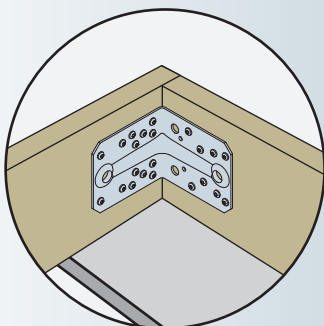
There's no better feeling than when you have built something yourself. This guide will help you build your own wooden deck and will help you to select the right connectors and fasteners for the job. The connectors and fasteners you use will have a big impact on the end result! We will help you find the right solutions for your project.

First of all, it is important to think through all the steps of building your deck. What do you want the end result to be, and how can you ensure that you are ready for all the different steps of the project. For example, are you going to build it close to or well above the ground? With or without railings? Will you enclose it with cladding? We recommend you read through the entire guide first, work out what you need to buy, and then get going with building the deck of your dreams!

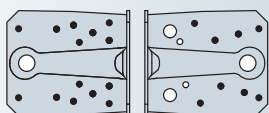


Base Structure

Installation of ABR10525Z Angle Brackets



To ensure a correct installation, it is important to install the angles as shown above, and to fasten with CNA nails or CSA screws as demonstrated here:



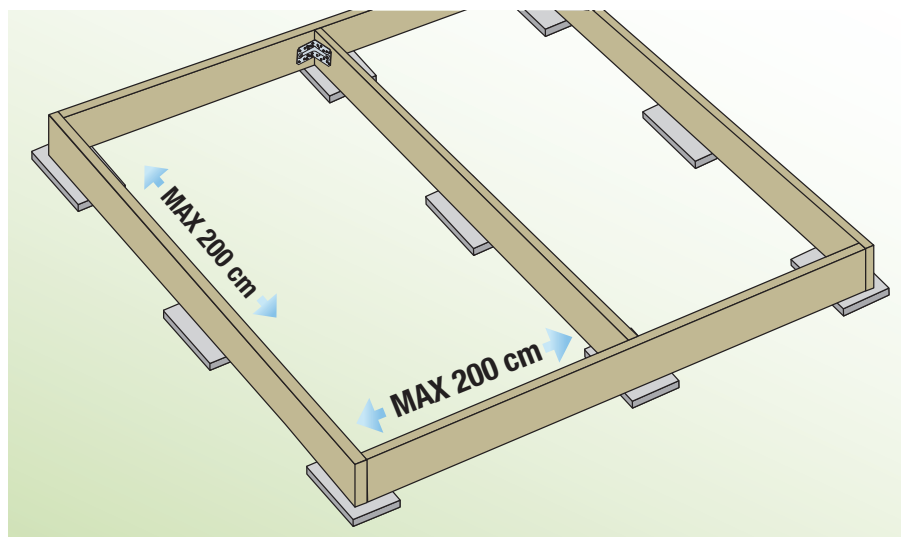
Remember that the outer frame must be rectangular. The simplest way to ensure this, is explained in the section headed 'Floor Structure, Cross-Measurement.'

The base structure for your deck will dictate how you start the project. There are three common base types, which can be combined if necessary.

- Base structure placed directly on the ground
- Base structure on post bases
- Base structure on rock ground

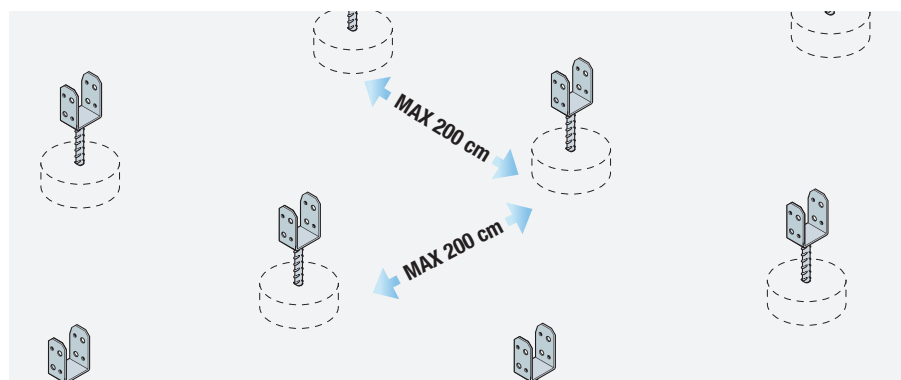
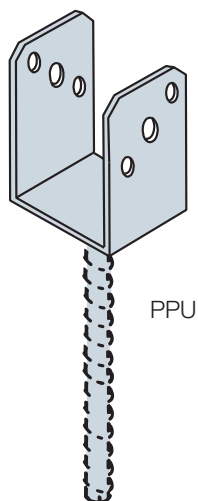
Base Placed Directly on the Ground

A base placed directly onto the ground can be used when the ground is level, hard-packed and where the deck should be placed at ground level. In this case, use ground sheets as underlay. The maximum distance between the wood beams should not be more than two metres. Use **ABR10525Z angle brackets (105 x 105 x 90 x 2.5 mm)** to connect the corners.



Base on Post Bases

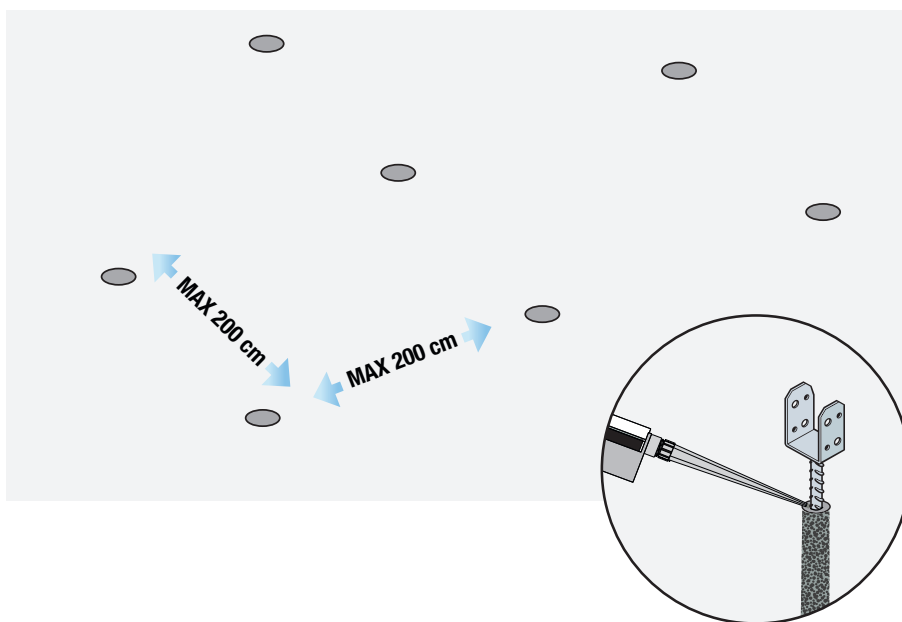
Building your base on post bases is the most common way to build a deck. This method is used when the ground is uneven or soft. Install your post bases into the ground by digging holes for each post base. Fill the holes with uncured cement and place the post bases in the cement and wait for it to cast (**For selecting the right post base see the section headed 'Post bases'**). In order for the wood dimensions given later in this guide to apply, the maximum distance between the post bases must not be more than 200 cm.



Base Structure

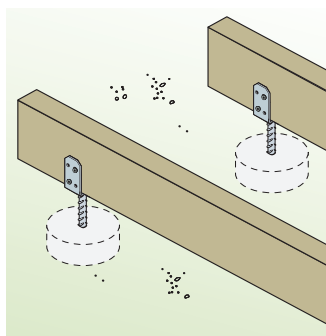
Base Structure on Rock Ground

When the ground consists of rocks in whole or part, you can use post bases to build directly on the rock surface. Drill 20 mm holes as deep as required (**For selecting the right post base see the section headed 'Post Bases'**). The maximum distance between them must not be more than 200 cm. Use **AT-HP chemical adhesive** from Simpson Strong-Tie to secure the post bases in the rock ground.

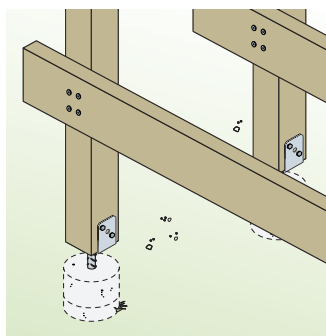


Post Bases

The type of post base you use will depend on the type of construction you are going to build.

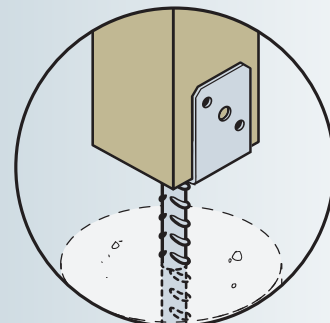


If the ground is relatively even, and the finished deck is going to be close to ground level, you can lay the wood beams directly in the post bases. If this is the case, use **post base PPU48/40G (48 x 40 mm)**.

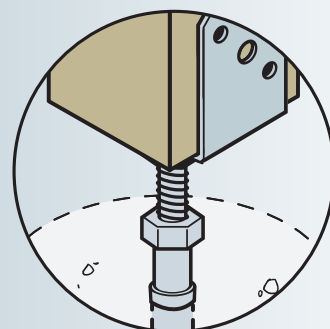


If there is a difference in level, or if the finished deck will be well over ground level, you will need to build with posts. If this is the case, use **post base PPU98/60 (98 x 60 mm)**.

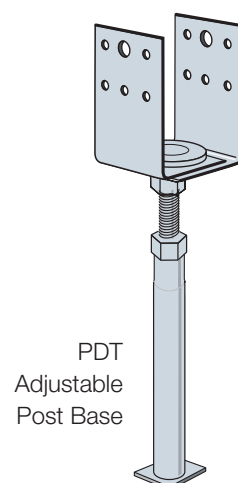
Installation of PPU Post bases



! Never set the post bases more than 50 mm above the surface. Always make sure the wood is resting in the shoe of the post base.

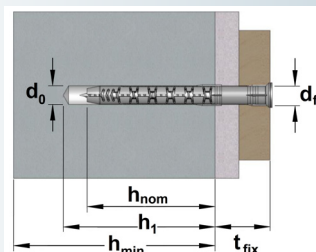


Embed adjustable **post bases like PDT** to make it easier to get everything level.



Joist and Ledger Attachment

Installation of FPN Concrete Screws



1. Drill a hole in the base material using a carbide drill bit the same diameter as the nominal diameter of the anchor to be installed.
2. Drill the hole to the specified nominal anchorage depth h_{nom} plus a minimum hole depth overall (h_{min}) to allow the thread tapping dust to settle and blow it clean by using a hand pump or compressed air.
3. Insert the anchor through the fixture into the hole.
4. Tighten the anchor using an impact screw driver into the base material until the hex-washer head contacts the fixture.

Joists and Ledgers

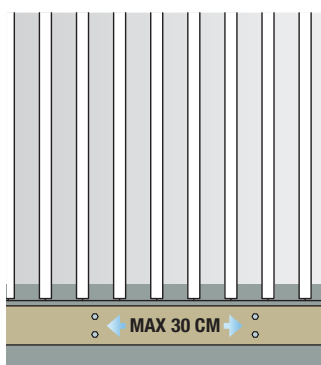
Joists and ledgers are needed to be able to build a floor construction. Because of snow load, your choice of timber should be based on the climate zone where you are building your deck. The final level of your deck, and how you build the floor construction, will depend on how your joists are placed. If your deck is build up against your house, start by fastening a ledger directly into the foundation of the house.

Attaching a Ledger to the House

If you are fastening a joist to the house's foundations, you can use a **FPN A4 Concrete Screw (8.0 x 120/50)** according to the instructions below.



FPN 8-120/50 A4 Concrete Screw



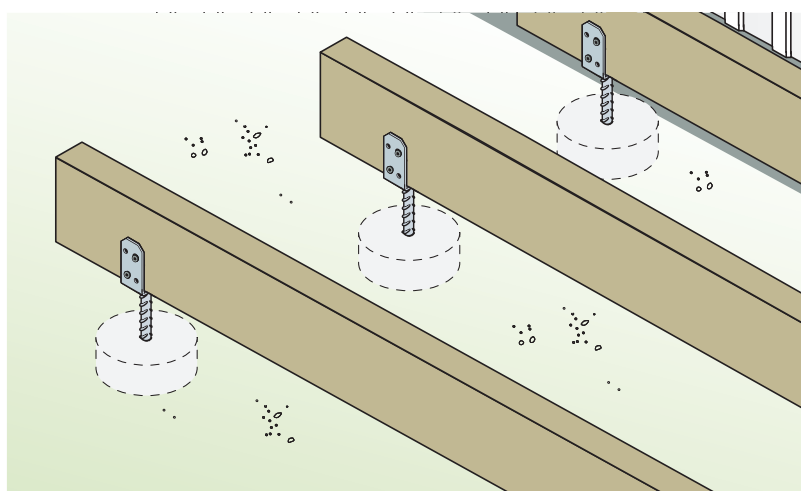
Ledger Attachments

The level of the joists will be determined by the ledger on the foundation/inner joist, and whether using a recessed or transverse floor construction (**see the section headed 'Floor Construction'**). Below, you can see how to fasten the outer joists to the posts, or directly into joist hangers. If you need to connect two joists, see the section headed 'Connecting two joists'.

Can be increased to 60 cm for concrete. Place a piece of building paper between the ledger and the concrete.

Decide the level of the joists, and use a spirit level to ensure that they are level. Pre-drill through the ledger and into the house's foundation using a 8.0 mm drill-bit. Fasten the ledger using two concrete screws for every 30 cm, as shown above.

Joist Attachment with Post Bases

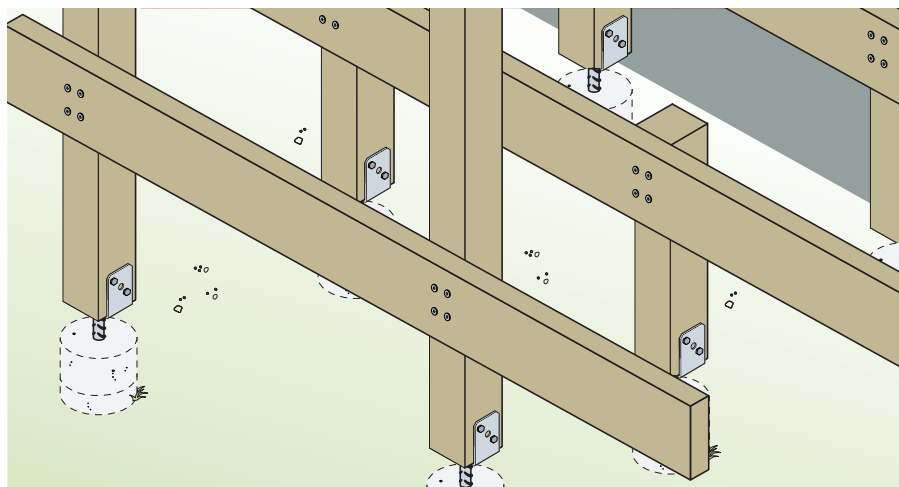


Fasten the joist to **PPU48/40G** using either four **connector nails CNA4.0x40G** or **connector screws CSA5.0x35Z**.

If you choose adjustable **post bases like PDT**, you can now adjust the joists to ensure that they are level in relation to each other quite simply.

Joist and Ledger Attachment

Joists Attached to Posts

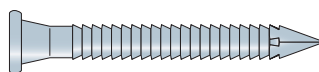


Fasten the posts to the post bases **type PPU98/60G** using four **hexagon head connector screws SSH8.0x40**. Then fasten the joists to the posts using four **counter-sunk wood screws TTZNFS6.0x120** or **double threaded wood screws SWD6.5x90**. If you are putting railings on your deck, do not cut off the excess top part of the outer posts.

Structural Connector Nails and Screws

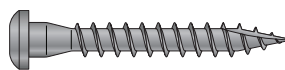
If you are fastening a connector on wood outdoor, you can use **CNA4.0x40G nails**, **CSA5.0x35Z** or **SSH8.0x40**.

CNA-G hot-dip galvanised annular ring-shank nails are recommended for outdoor connector assemblies.



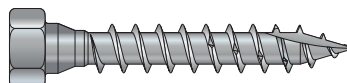
CNA4.0x40G

CSA-Z connector screw give a fixed connection with larger cross-bearing capacity than for standard screws.



CSA5.0x35Z

SSH is used together with connectors where high load capability is required.

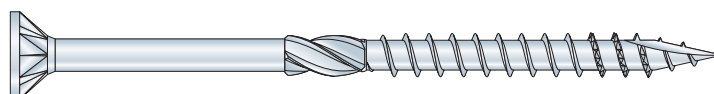


SSH8.0x40

Structural Wood-to-Wood Screws

If you are fastening wood to wood, you can use **TTZNFS6.0x120** or **SWD6.5x90** screws.

TTZNFS screws have a serrated thread to reduce the resistance when driving. It has a Type 17 point which prevents splitting.



TTZNFS6.0x120

SWD is a construction screw designed to connect two wood members together. The small cap-style head and double thread creates a flexible, hidden assembly with high strength.



SWD6.5x90

Materials and Coatings:



Hot Dip Galvanised:

Products are dipped in melted zinc 550 - 560°C, chemical reaction between the steel and the zinc. It provides a good corrosion resistance in most environments.



Impreg®+: Products

are dipped in liquids that consists of zinc and nickel. It offers really good corrosion performance and has a low risk of galvanic corrosion.



ZPRO®: ZPRO is a

unique coating for connectors which gives a similar corrosion protection to hot-dip galvanised steel with 55 µm zinc - corrosion category C3 (EN ISO 12944).



Stainless Steel A4:

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.

Floor Construction

Transverse and Recessed Floor Constructions

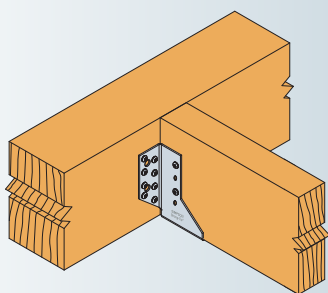
The two most common types of floor constructions are **transverse** and **recessed**. The choice of spacing (s-distance) for the floor construction is shown under the section headed 'Deck boards'.

Transverse means that the floor construction rests on the outer joists and is fastened to the ledger on the foundation as shown below.

A **recessed floor construction** means that the floor construction is recessed between the joists, as shown below.

Installation of BSNN Joist Hangers

BSNN Joist hangers are installed on wood with CNA nails or CSA screws but can also be installed directly on concrete.



2: Fasten the outer joists with two **countersunk wood screws TTZNFS6.0x120** or **double threaded wood screws SWD6.5x90** in the end of the middle joists, and using **angle bracket ABR10525Z** on the outer joists, and the joist on the foundation.

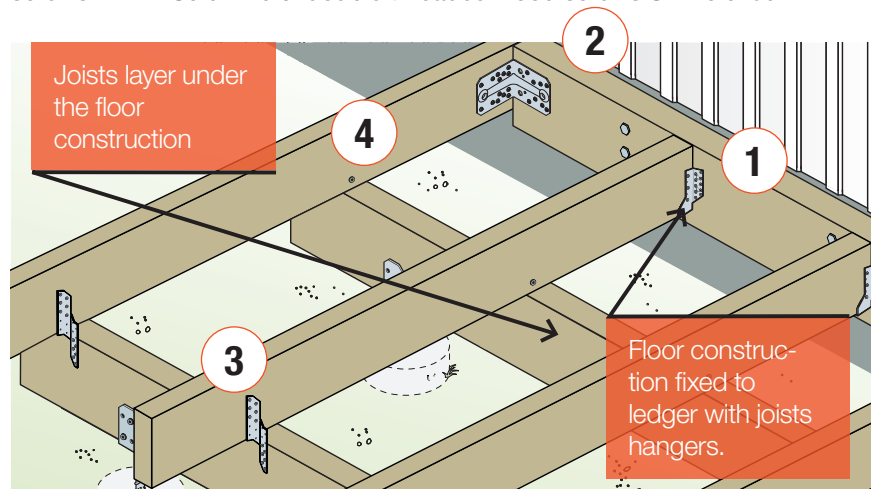
Transverse Floor Construction

1: Use **joist hanger BSNN45x93** or **BSNN45x138** against the ledger. Fasten with **connector nails CNA4.0x40G** or **connector screws CSA5.0x35Z**. Insert nails or screws in all holes.

2: Fasten the outer joists to the ledger using **angle bracket ABR10525Z**. Fasten it using the same hole pattern as shown in the section about '**Bases Placed Directly on the Ground**'.

3: Mount two **SPF210 connectors** diagonally between the outer joist and the underlaying base construction. Use the same nail and screw dimensions as for post bases. Nail/screw all holes apart from the row of holes nearest the wood edge.

4: Diagonally fasten the floor construction to the centre joist using **countersunk wood screws TTZNFS6.0x120** or **double threaded wood screws SWD6.5x90**.

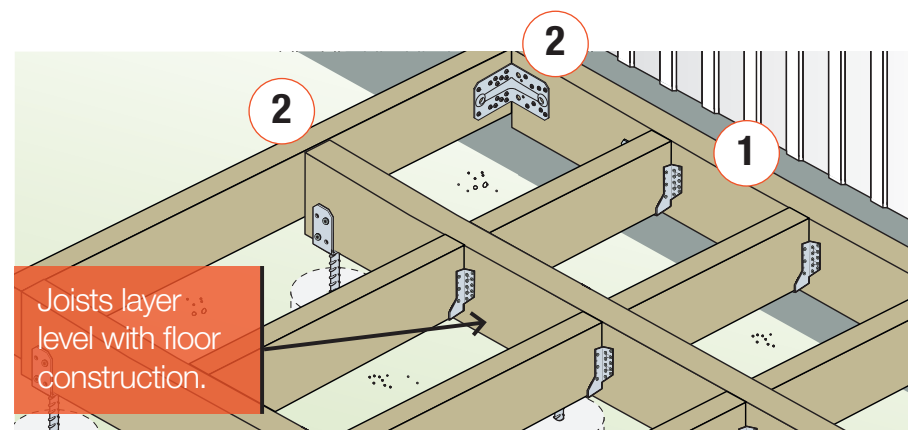


In a **transverse floor construction**, if the ledger is fixed to the foundation, then the ledger and floor construction should be level.

If building directly on the ground, place an extra row of post bases close to the house. You can also lay the floor construction directly onto the ledger. If so, fasten with **SPF210 connectors**.

Recessed Floor Construction

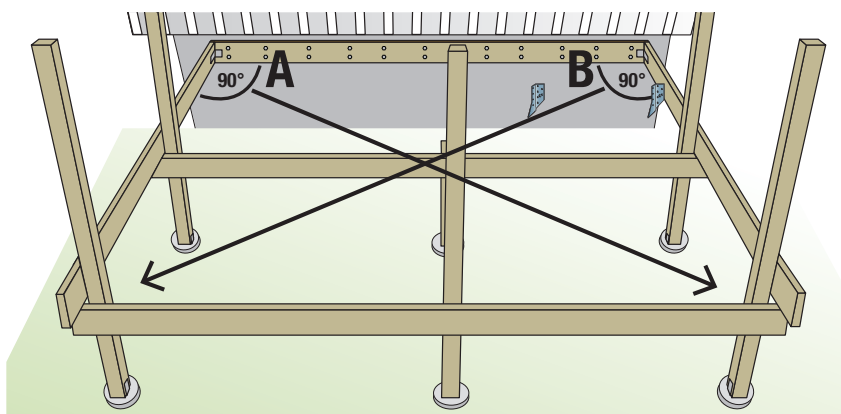
1: Fasten the floor construction using **joist hanger BSNN45/93** or **BSNN45/138** at both ends. Use **connector nail CNA4.0x40G** or **connector screw CSA5.0x35Z**. Nail/screw in all holes.



Floor Construction

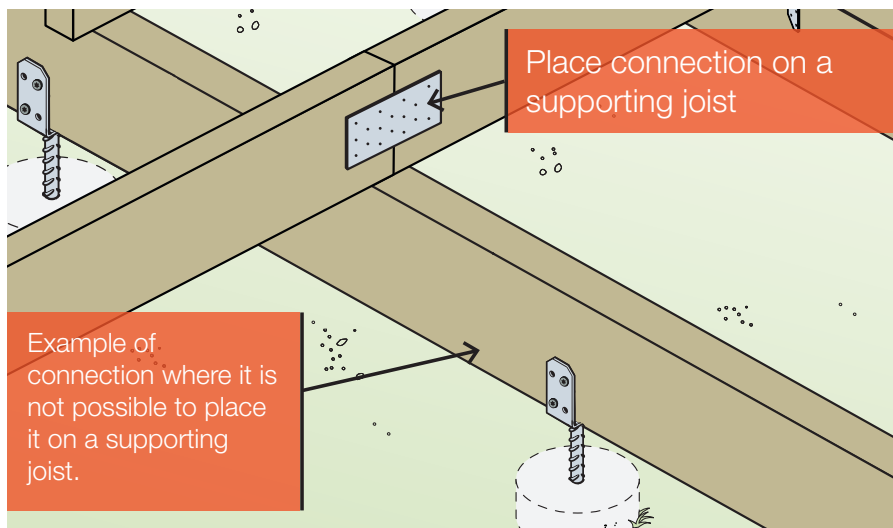
Cross-Measurement

Before fastening the joists, it is important to cross-measure the construction. The corners should be 90 degrees. The easiest way to check is to cross-measure the construction. Lines A and B should be the same length ($A=B$).



Connecting Two Joists

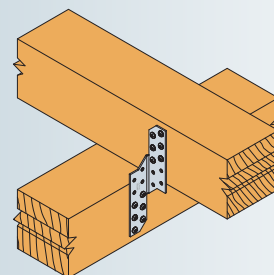
If you need to connect two joists, use a **nail plate NP20/160/400** on each side. Connecting the floor construction is done over a joist, as shown below. Use a **nail plate NP20/120/300** on each side. In both instances, leave the inner row of holes on both side of the connection empty, and then nail all holes every other vertical row.



When it is not possible to place a connection on a supporting joist, the connection with nail plates should be made 1/6 in from the post base, as seen above.

Installation of SPF Connectors

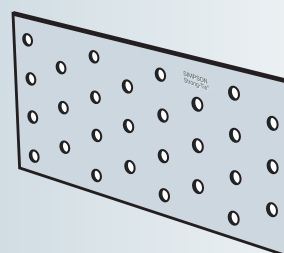
SPF connectors are installed on wood with CNA nails or CSA screws.



Installation of NP Nail Plates

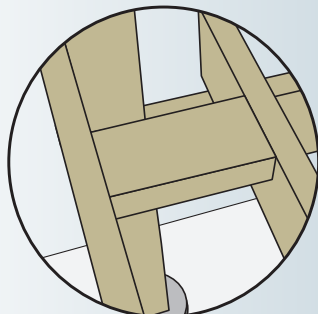
NP nail plates are installed on wood with CNA nails or CSA screws.

Always remember to respect the minimum distances to the wood edges to avoid the wood splitting.



Preparing Your Deck for:

Installation of Wood Spacers



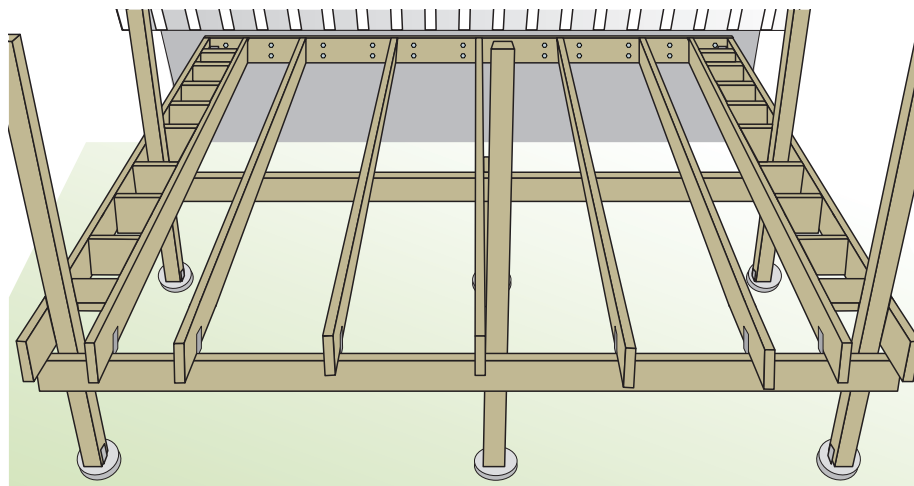
It is a good idea to fasten a piece of wood in the corner. This provides a wider surface to which the decking boards can later be fastened (see illustration under the heading 'Deck Boards'). Use four **TTZNFS6.0x80** or **SWD6.5x90 screws** and screw between the beams into the wood piece from both sides.

Steps

Have you decided how you will build steps if you need them? Regardless of whether the steps are prefabricated or made assembled at the site, the wood may need local reinforcement. If so, now is your chance to do so.

Enclosure Boards

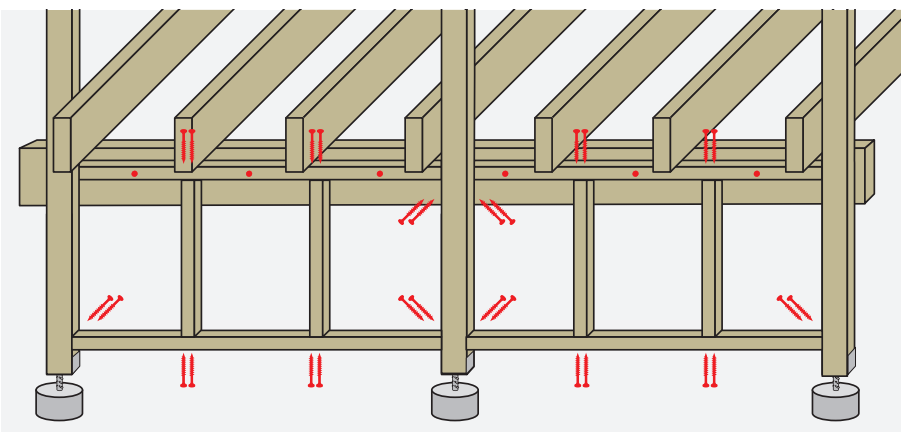
Depending on how many boards you use for your enclosure, and the dimension of the wood you choose, you may have to add an extra joist. Use the same fasteners as shown in the last section.



Place spacers between the outer joists and the one you have added. You can then lay the outer boards at right angles to the others. Use four **TTZNFS6.0x80** or **SWD6.5x90 screws** and screw between the joists into the spacer from both sides.

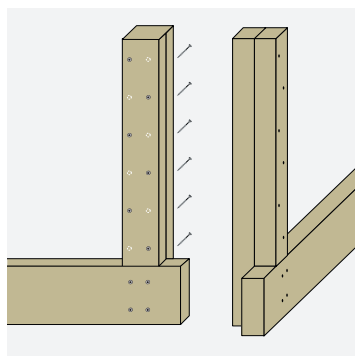
Cladding

If you want to put cladding on your deck construction to conceal the space beneath, it's best to prepare for it, before laying the floor. The easiest way is to use the existing construction, and add additional wood pieces on which you can fasten the cladding. Use **TTZNFS6.0x120** or **SWD6.5x90 screws**. An example is shown below.



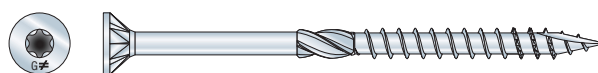
Preparing Your Deck for:

Railing



If you have chosen to build directly on the ground or with post bases, it is important to fasten the posts to the outer joists before laying the floor. The posts will provide the fastening surface when you begin to build your railings. Use **countersunk wood screws TTZNFS 6.0 x 80** and screw as shown to the left.

TTZNFS screws have a serrated thread to reduce the resistance when driving. It has a Type 17 point which prevents splitting.







TTZNFS 6.0 x 80

Deck Boards

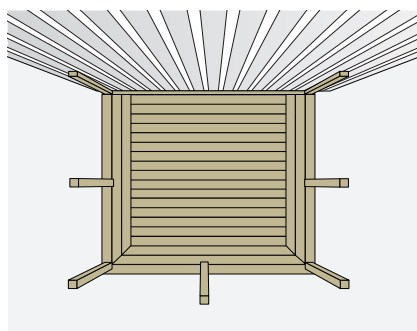
Have you decided what wood to use? The choice of wood and its dimensions will not only affect the final appearance, but also how close together you will have to place the decking boards, and the dimensions of the screws you need. The choice of boards and the environment you build in should also influence your choice of screws.

Space Distance, Floor Construction and Screw Usage:

Boards 	Screw Length	400 mm 	600 mm 	800 mm 
22 x 95 mm	45 mm	Approx 55 pcs/m ²		
28 x 95 mm	55 mm		Approx 40 pcs/m ²	
28 x 120 mm	55 mm		Approx 35 pcs/m ²	
34 x 145 mm	75 mm		Approx 30 pcs/m ²	Approx 25 pcs/m ²

Choice of Screw Type Depends on the Environment and Wood Type

If you are building in an 'extreme' environment such as close to the ocean or a swimming pool, it is important to use stainless steel A4 decking screws such as our **TTF A4 screws**. We recommend the **DSPROA4 pro hardwood decking screw** for all hardwood types. If building in a normal outdoor environment using normal pressure treated wood, you can use **DSIX4 decking screws** or **DSPIX4 pro screws**, which are coated with the unique Impreg® X4 coating.



If you are putting railings on your deck, use two 45 x 95 wood pieces on the façade. Use **TTZNFS6.0x80** or **SWD6.5x90 screws** to fasten.

If you have chosen a transverse floor construction, screw from the wall and outwards.

Cut the joists before laying the final board. If building with a recessed floor construction, screw outwards and in towards the wall. The final board may have to be split.

Pre-drill to avoid the risk of the wood splitting. Mark a chalk line for wood pieces for every meter to ensure you keep it straight.

Decking Screws & Fastening Systems

Decking Screws

Simpson Strong-Tie offers a variety of premium solutions for fastening wood decking. Our fasteners are designed specifically to perform in their target decking material.

Stainless Steel A4 Screws

TTFA4 Countersunk Decking Screw

For the majority of wood deck boards.



DSPROA4 Hardwood Decking Screw

For hardwood deck boards such as Cumaro, Bankirai and others.



Impreg®X4 Outdoor Screws

DSIX4 Countersunk Decking Screw

For pressure-treated deck boards.



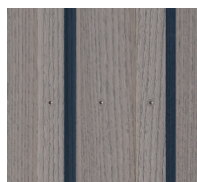
DSPIX4 PRO Decking Screw

For pressure-treated deck boards.

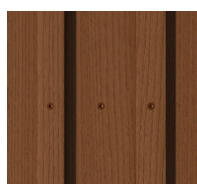


Cladding Screws

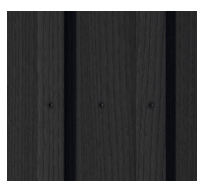
CLSA4 Stainless Steel Cladding Screws



CLSA4 Stainless Steel Cladding Screw
With Painted Head RAL 7004.



CLSA4 Stainless Steel Cladding Screw
With Painted Head RAL 8007.



CLSA4 Stainless Steel Cladding Screw
With Painted Head RAL 9011.



CLSA4 Stainless Steel Cladding Screw
With Non-Painted Head.



CLSZN Cladding Screw
With Impreg®+ coating for outdoor use.



Materials and Coatings:



Stainless Steel A4:

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.



Impreg® X4: The Simpson Strong-Tie Impreg® X4 coating is a proprietary coating that provides a very good

level of corrosion resistance. It can withstand the aggressive chemicals in treated wood.

Quik Drive® Screws for Decking

Quik Drive®

A perfect alternative to traditional nailing and screwing.

The Quik Drive auto-feed system provides a significantly faster way to install screws. With a multitude of modular fittings and screws for a huge range of purposes, there is a Quik Drive kit to suit just about every application.

It's ergonomic too, allowing the installation of screws into walls, floors and ceilings without the need for bending, stretching or crouching. Which means not only can the system operate for several hours at a time – so can you.

Simple to use, the Quik Drive system fits onto all leading drywall drivers with just a click. The patented screw strips are designed to avoid jamming and unlike many collated screw strips, a partially used one can be saved for reuse later – so its cost effective too.

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.

SSDTH Box Thread Decking Screw

Stainless A2 screw for the majority of wood deck boards.



SS3DSC Decking Screw

Available in A2 and A4 stainless steel screw for the majority of wood deck boards.



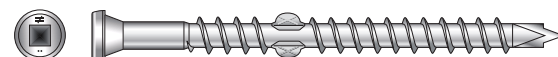
SSDHSD Hardwood Decking Screw

Available in A2 suitable for Hardwood deck boards.



SSDHPD Hardwood Decking Screw

Available in A2 suitable for Hardwood deck boards.



QD76KE Multipurpose System

- Complete with interchangeable nose piece
- Suitable for screws 25 mm to 76 mm long
- Self-locking depth adjustment for consistent countersink of screws
- Connects easily with screw gun or extension



QDPRO76SKE Decking System

- Suitable for screws 38 mm to 76 mm long
- Used for fixing hardwood or softwood deck boards to wood sub frames
- Self-locking depth adjustment for consistent countersink of screws
- Connects easily with screw gun or extension

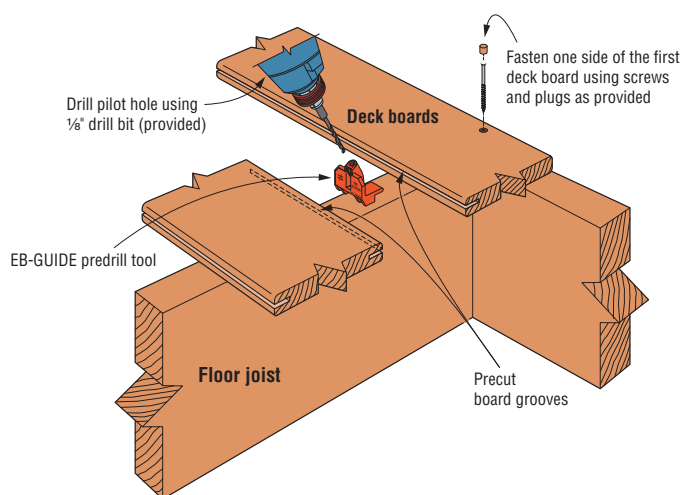
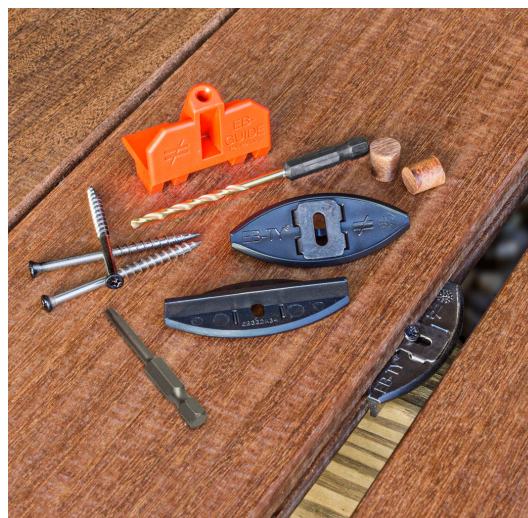


EB-TY Hidden Deck-Fastening System

Optimize Your Decking Investment - There's nothing like premium decking to add the perfect finishing touch to a beautiful outdoor living space. When investing in exotic hardwood, redwood and cedar decking, it's essential for you to choose the right fastening method to ensure durability while letting the beauty of the material shine through.

The new 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.

Simpson Strong-Tie has redesigned the award-winning EB-TY Hidden Deck-Fastening System by integrating a Type 300 series stainless-steel reinforcing plate that adds stiffness to hold boards in place securely, yet maintains flexibility when seasonal contraction and expansion occur. Combine this innovative new design with our EB-GUIDE predrilling tool, and you have a system that not only provides hidden strength, but is also easy to install.

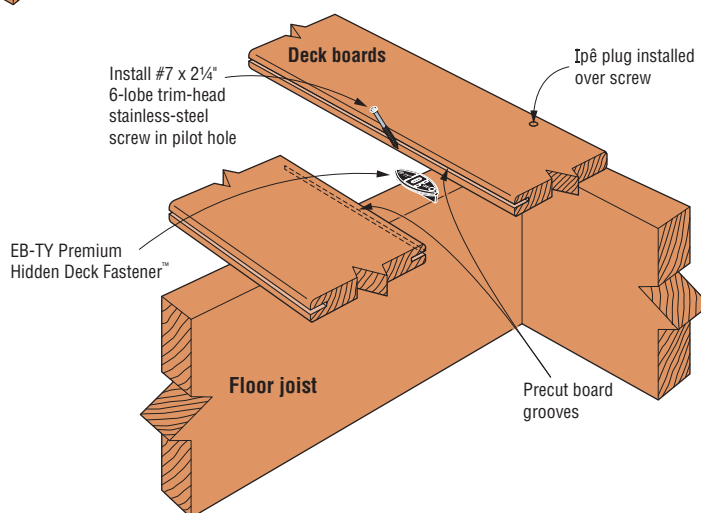


Angled Screw Attachment

- Ensures direct attachment of the board to the joist
- Keeps the board from "walking" or sliding
- Allows tighter spacing

Radius Sides for Easier Alignment

- The patented arc shape of the EB-TY also helps ease insertion — works with pregrooved and biscuit-cut slots
- Chamfered edges for easier board alignment and installation of successive boards



The easy way to a picture perfect deck.



EB-GUIDE

Introducing EB-TY Premium Hidden Deck-Fastening System

The new EB-TY Premium system comes with the specially designed EB-GUIDE predrilling tool to ensure precise and efficient fastening. The system's redesigned biscuit features a stainless-steel reinforcing plate to endure a strong, concealed connection - showcasing the natural beauty of the deck.

