

Building a timber substructure to support  
**Wood Plastic Composite  
(WPC) Deck Boards**

# Building a timber substructure to support Wood Plastic Composite (WPC) Deck Boards

This document provides guidance on what to consider when building a timber substructure for wood plastic composite deck boards, sometimes referred to as WPC or wood composite.

The information given in this publication is based on those guidelines for installation on domestic properties.

Commercial decks require more robust design, materials and construction to deal with the loads placed on them and are not covered by the guidance in this booklet.

More detailed information can be found in Timber Decking: the Professional's Manual, available to purchase from TDCA.



London Decking Co.



The Timber Decking & Cladding Association (TDCA) is an independent, not for profit, technical and advisory organisation dedicated to promoting quality materials, good practice installation and maintenance standards.

The information contained in this publication is given in good faith and without warranty. It is the builders' responsibility to ensure any structure is safe and fit for purpose.

## Before starting work

### Is planning or building consent required?

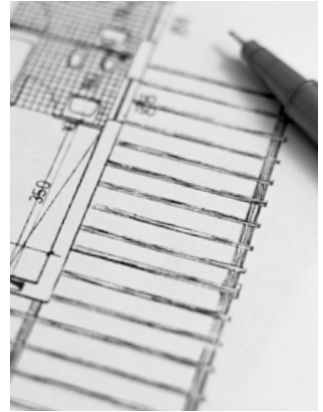
It is the property owner's responsibility to find out before work commences. Always check with the Local Planning Department first if:

1. The deck platform is more than 300mm from the ground.
2. The decking occupies more than 50% of the garden area, taking extensions and outbuildings into account.

**Building control consent applies to any construction work that requires planning consent.**

Visit the government planning portal for more information:

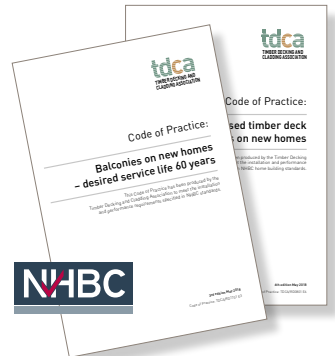
[www.planningportal.co.uk](http://www.planningportal.co.uk) and search for 'decking'.



## New Builds

For new homes, the National House Building Council (NHBC), requires that all decks are built to Timber Decking & Cladding Association (TDCA) guidelines. All raised deck structures and balconies must comply with TDCA good practice design and build standards and provide long service lives.

Details of these specifications are available in **Codes of Practice** available from the TDCA website.



## General Advice

The timber decking and cladding association offers the following advice if you have chosen wood plastic composite decking; indeed this is good advice for any purchase you make:-

Investigate the quality of the product before buying, obtain samples and seek testimonials and/or independent accreditations.

Ask for a copy of the supplier's installation guidance and follow it to the letter – if you don't, installation errors may mask product quality issues if a problem arises.

Closely examine any warranties given with the product – check the specifics of the warranty, what precisely it covers and who underwrites it. Ask about the process for making a claim.

Keep all your documents, communication exchanges and receipts safe for future reference.

Note dates and timings and start taking photographs if anything untoward begins to happen.

If you become involved in a claim, check if your house insurance policy covers legal assistance as it may help to finance it.

# WPC and timber - the key differences

There are two key differences between wood plastic composite and real timber decking:

1. Firstly, unlike timber where expansion along the grain is negligible, WPC products tend to **expand along the length of the board** so you need to have appropriate expansion gaps between abutting boards and adjacent surfaces to allow for this movement.

Expansion rates may vary so it is essential to seek and follow supplier guidance.

2. Secondly, WPC is generally **not as strong as timber** so you usually need to **space your substructure joists closer together to provide adequate support**.

Again it is imperative to seek and follow the guidance of your supplier and/or manufacturer.

If you are refurbishing an existing timber deck by replacing timber deck boards with wood plastic composite boards, it is likely that the substructure has not been designed to adequately support the wood plastic composite boards. **If you do nothing to upgrade the substructure, you risk serious problems in the future.**

You should also bear in mind that the substructure will have been in use for a number of years and therefore already used up some of its serviceable lifespan.

## Safety considerations

**WPC decking can be very heavy.** Take care when handling and use appropriate manual handling techniques.

**Some WPC material can become hot from the heat of the sun.**

When in use, test the temperature before stepping out in bare feet on a hot day.

## WPC component installation

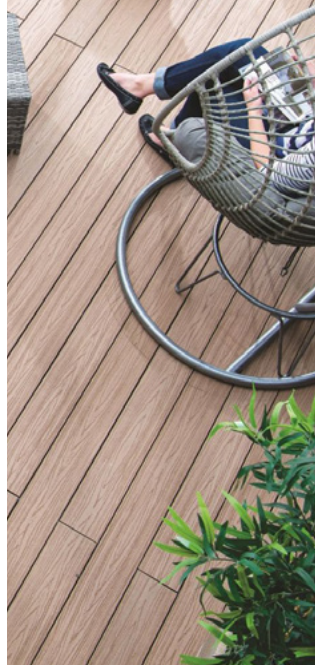
**Most wpc deck boards need to be 'conditioned' prior to installation.**

This requires them to be unpacked and laid out flat, side by side on the completed substructure for 24 hours.

Specialist fixings are typically used with WPC products, particularly 'secret' fixings, clips and coloured trim fixings. **Only use fixings that are recommended by the WPC product supplier and always apply them according to their advice.**



Alchemy WPC



# Choosing the right timber for your WPC deck substructure

Commonly, industrially applied, preservative pressure treated softwood is the most economical material used to construct decking substructures. This guide is based on using such material. *Softwood is a term used for timber produced from coniferous, mostly evergreen trees.*

**Make sure the timber product has been treated to the correct standard capable of giving a minimum service life of 15 years.**

- The TDCA recommends that all deck sub-structure components – posts, beams and joists, **are treated to a Use Class 4 ground contact specification** (see table 1).

The pressure impregnation of timber is tailored to its end use and the required desired service life. It is therefore important that you specify treatment or a treated component to match the durability of your selected WPC deck board – typically 15 or 30 years.

**Table 1: (Ref. BS EN 335:1) British Standard Use Classes relevant to timber decking substructures**

USE CLASS	APPLICATION	TYPICAL PRODUCT
4	EXTERNAL: ground or fresh water contact and/or providing exterior structural support	Deck beams, posts & joists, fence posts

**Internal flooring and roofing joists are Use Class 2 and are NOT suitable for exterior use.**

- **Ask your supplier for documented evidence of treatment to support your purchase and keep it safe.**

The green colour of treated timber indicates it is pressure treated but it doesn't tell you to what level. Therefore, it is good practice to ask your supplier to give you written confirmation to support i) where your timber can be used and ii) how long it is designed to last given good design and proper use.

**Only use timber that is certified as being sustainable and from legal sources – PEFC / FSC.**

**When purchasing timber, ask the supplier to confirm its moisture content is below 20% - installing timber when wet can lead to problems.**



If you buy wood that is not treated to the correct standard, it is likely to fail prematurely – endangering the public in addition to putting your reputation at risk.

For ALL substructure timbers - specify Use Class 4.



DeckMark® Plus components have undergone additional specific technical or safety evaluations by a recognised quantitative procedure.



Hoppings Softwood Products

## Timber strength class

To comply with building regulations all deck substructure timbers used should be strength graded.

**C16 is the minimum strength class** that should be used but **C24** strength class is recommended for **domestic decks that will carry heavy loads.**

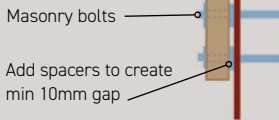
## Look for quality accredited products

Components with the **TDCA DeckMark®** quality accreditation have been independently assessed for manufacturing quality.

## Deck construction the basic principles



### Wall Plates



Joist face fixed to wall plate with joist hanger



## Site preparation

Clear all vegetation from the site of the deck. Lay weed suppressing sheeting held in place with clips or a layer of gravel if the under-deck area is visible.

## Attaching a deck to a property

Wall plates (*sometimes called ledger boards*) are used where a deck is attached to a property. **Leave a gap (10mm minimum) using washers or packing pieces between the property and the wall plate to allow rainwater to drain freely.** Take care not to damage or bridge the damp proof course of the property.

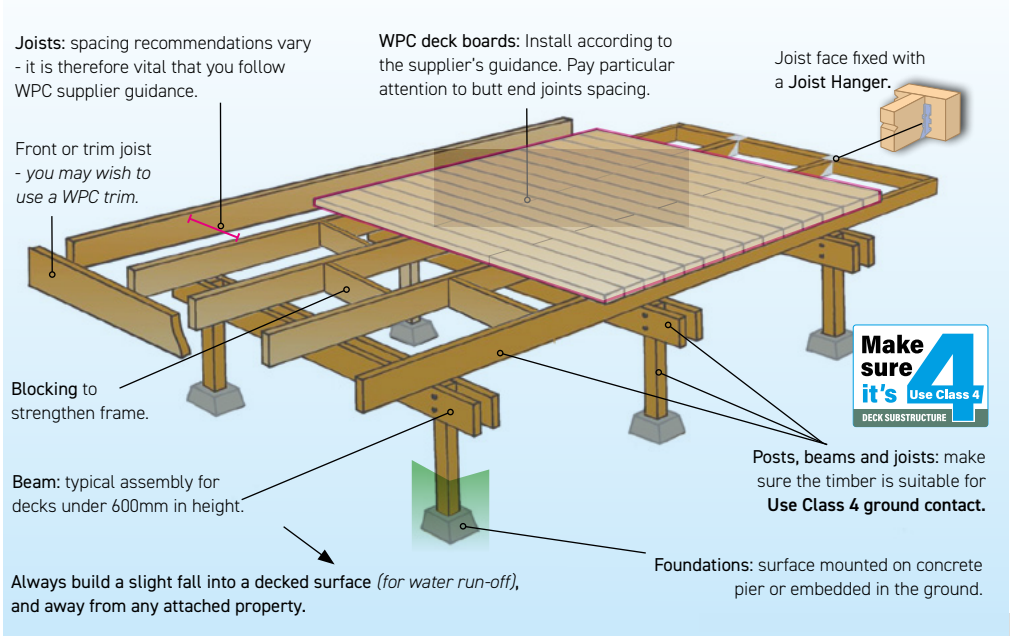
## Joist spans and support

Joists are typically spaced 500 - 600mm at support centres in a wholly softwood timber deck made of C16 strength graded timber. WPC boards usually require spans of **300mm for commercial decking** and **400 mm for residential decking.** This is due to the structural integrity of the boards (the heat of the sun can flex out of shape).

**It is important to check joist span recommendations with your WPC product supplier and/or manufacturer.**

## Deck Substructure

The diagram illustrates the basic principles of a post and beam layout of a deck substructure construction.



## Metal fixings for timber components

**Stainless steel, hot dipped galvanised or high quality coated carbon steel fixings are best for fixing treated timber.**

Electroplated, brass or uncoated steel fixings should NOT be used.

For more detail, see the [TDCA Technical Bulletin: TB08 Metal fixings](#).



## Cross cutting

When cross cutting or notching preservative treated wood on site **always swab the cut area with a brush-on end-grain preservative**, available from your timber supplier. This maintains the integrity of the protection and avoids invalidating any warranty given on the treatment.

**NEVER** put cut ends in the ground, even if end grain coated.



## Deck parapets or balustrades

For all but the most basic low-level deck, the incorporation, design and construction of a parapet should be treated as an integral part of the overall project and not a feature to be added at a later date.

For more information see the [TDCA Technical Bulletin: TB04 Deck parapet design and construction](#).



Deckbuilders UK



## Further help and information

Visit the TDCA web site [www.tdca.org.uk](http://www.tdca.org.uk), for more detailed information about deck design, construction and maintenance.

There's answers to frequently asked questions and case study inspiration as well as useful publications and signposts to online training resources.

You'll find a **database of UK** stockists supplying quality approved decking products from **fixings to coatings**.

## Useful TDCA publications

**Timber Decking: the Professional's Manual**

**Technical bulletin 02** Planning & building regulations

**Technical Bulletin 04** Deck parapet design and installation

**Technical Bulletin 08** Metal fixings

**Code of Practice 0801:** Raised timber decks on new homes

**Code of Practice 1701:** Balconies on new homes - 60 years DSL



**TDCA DeckMark®** is a scheme that certifies the quality of manufactured products used for decks and outdoor structures or the capabilities of design and installation contractors.

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