



**TIMBER
DEVELOPMENT
UK**

THE TIMBER DECKING HANDBOOK

for specifiers, buyers and installers



Cover images (from top left):

Yellow Balau decking (Silva Timber);

The Rising Path Project – Accoya® Wood (Accsys/Gripsure);

Woodlands, Glencoe – Premier anti-slip softwood boards (Gripsure);

Yellow Balau decking (Deckbuilders Ltd);

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THE TIMBER DECKING HANDBOOK

for specifiers, buyers and installers

FOREWORD

Timber decking provides an attractive and often economical way to create a unique outdoor space, seating and entertaining areas or garden landscaping. Decking is ideal for residential and commercial projects alike – from patios and terraces to walkways, piers and playgrounds.

Wood's natural properties bring added value too. It is warm to the touch and easily worked and its proven sustainability as a renewable building resource means it has got a lot going for it!

Correctly specified, designed, installed and maintained timber decking structures can be enjoyed year after year.

This handbook aims to provide definitive guidance, as well as design inspiration, in a clear and easy to follow format. If some of the terms used are unfamiliar then the Glossary at the back of the handbook is a handy reference. The publication aligns with British Standards where applicable, making it both authoritative and consistent.

A collaborative resource from Timber Development UK, the Timber Decking and Cladding Association, the Wood Protection Association and Wood Campus. This handbook is designed to be the 'go to' reference for all things timber decking.



Independent, not for profit organisation that acts as a technical and advisory body for the UK timber decking and cladding industries.

www.tdca.org.uk



Not for profit trade body promoting and developing timber treatment technologies that enhance the performance and value of wood products.

www.thewpa.org.uk



A Swedish Wood initiative providing a range of information, inspiration and learning tools for DIY, architects and trade users of wood.

www.woodcampus.co.uk



St Paul's Square, Birmingham.
This creative decked circular
platform is constructed from
individually engineered, pressure
treated Scandinavian Redwood by
Deckbuilders Ltd.



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WHY TIMBER IS A GOOD CHOICE

Images

Below: responsible forestry management.

Below right: harvesting operations (BSW Timber, Dalbeattie).

Page 7: Timber decking and access walkways complement the surrounding forest at Woodlands, Glencoe (Gripsure).



Wood has long been used as a structural and finishing material in construction, just look at the iconic and historic buildings around us. The appeal for wood is varied – its aesthetic qualities, natural durability, flexibility, weight to strength ratio and ease of working. Today it is even more relevant as it's one of the few building materials that can help us meet carbon zero goals due to its environmental credentials.

Timber's practical advantages

- Strong yet lightweight.
- Easily worked, can be adapted quickly to suit on-site changes or repairs.
- Comparatively economical as a building material and can be locally sourced.
- Performance and longevity of lower durability (and cheaper) timber species is easily enhanced by factory based treatment technologies (preservative treatment or wood modification, see [Material Selection: Performance](#)).
- Surface finishes can be applied to change the appearance and give added protection or functionality (see [Material Selection: Colour, Coatings and Inlays](#)).
- In general, timber decks require less groundwork compared to masonry style construction, especially on sloping sites that require levelling to create a usable space.
- Suitable for both new build and renovation projects.



TELL ME MORE >

Biophilic Design

- connecting with nature

Incorporating natural elements in the built environment, such as wood, water, sunlight or plants, has been proven to improve people’s overall health and well-being. For example, designers of medical facilities such as hospitals are rediscovering the natural benefits of using wood to improve both the experience of patients and the performance of staff. There’s extensive research being done.

See: www.bregroup.com



Timber’s aesthetic qualities

Timber is increasingly associated with its positive effect on mental health and well-being as it provides us with a connection to nature. Timber is:

- a tactile material that adds warmth and evokes a connection with nature;
- unique, each piece is different in grain and colour, encouraging design innovation;
- easily rejuvenated or decorated.

Timber’s environmental benefits

As climate change becomes a growing threat, the carbon footprint of construction and subsequent building use is in the spotlight. Specifying timber has major environmental benefits over other materials.

Wood CO₂ts less

FACT 1
Trees capture CO₂ from the atmosphere and store it as carbon

FACT 2
Mature trees are harvested and their carbon is captured and stored in buildings and other wood products

FACT 3
More trees are planted and the size of the European forest carbon sink continues to grow

FACT 4
Using wood instead of other materials saves CO₂ emissions, both through the carbon captured and stored in the wood product and the avoidance of alternative CO₂-intensive materials

FACT 5
One of the simplest ways to capture carbon and reduce CO₂ in the atmosphere is by increasing the use of wood in construction

FACT 6
Using wood in construction is a cost-free solution to carbon capture – reducing CO₂ in the atmosphere

- Timber is a renewable resource, with a plentiful supply. Forestry source certification schemes (such as PEFC) ensure sustainable management of both softwood and hardwood forests (see **Responsible Timber Sourcing**).
- Growing trees absorb CO₂ from the atmosphere and store it as carbon.
- Timber products created from harvested trees store the captured carbon for the whole of their service life.
- Timber requires less energy to produce than any other construction material - i.e. concrete or steel.
- Timber has a major potential for re-use or recycling at end of life or creating energy from biomass facilities.

Wood CO₂ts less is a collective mark of Wood for Good Ltd.

Visit: www.woodforgood.com/co2

DECK DESIGN AND PLANNING

Fundamentally, timber decking is a flooring system for use outdoors. Supplied in the form of deck boards these are secured independently with drainage gaps, onto a support structure typically comprising posts, beams and joists. A timber deck structure should be designed to be free draining and well-ventilated.

Deck board styles and arrangement

Timber deck boards are typically :

- supplied in long lengths, from 1.8m to 6.0m;
- rectangular in section, ranging from 19 - 45mm thick and 70 - 145mm wide.

Profiles

The two significant choices of board profile in the UK are **smooth** and **grooved**.

Enhanced grip boards with inserts of anti-slip material (in both profiles).

For use in areas where improved slip resistance is required – e.g. steps, ramps and key areas of decks and walkways for public access – are widely available in a variety of colours and patterns.

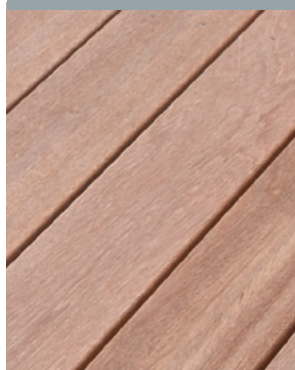
Generally all deck board edges are either **chamfered** or **pencil rounded** or **eased** for the purpose of shedding water and minimising the likelihood of edges splintering if subject to impact.

Dual sided



Eased edges aid water shedding and help avoid damage in service.

Smooth



Grooved



Enhanced Grip



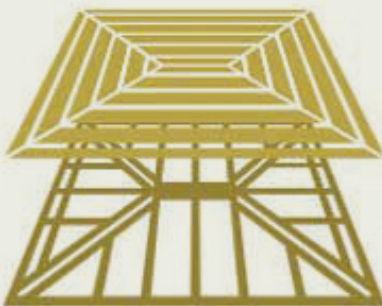
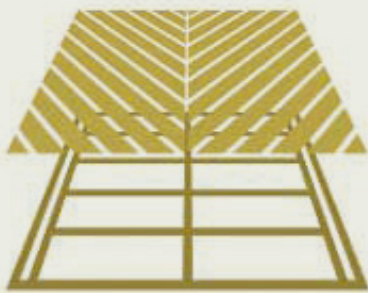
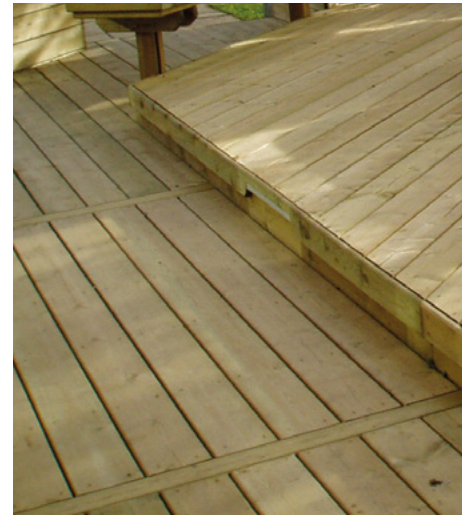
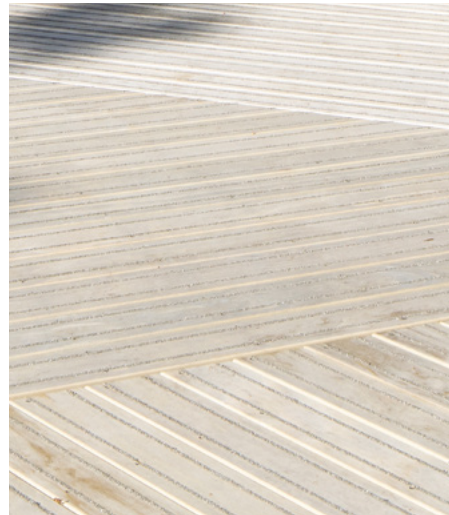
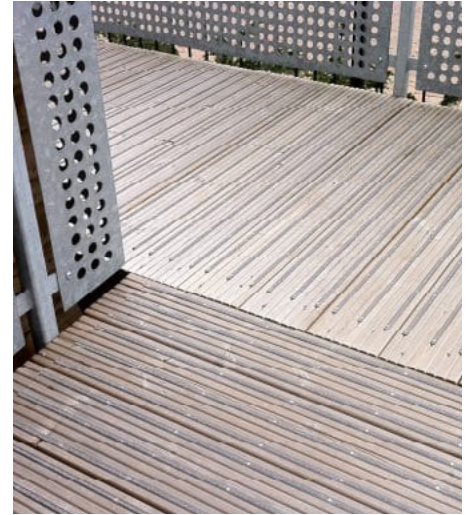
Purpose made, **dual sided boards** – smooth one side and grooved the other or differing grooved patterns on either side, are common and have been on the market for years.

They give the buyer the option of grooved side up or down – it's a preference.

If you do find grooved deck boards with **square, sharp top edges** on the smooth side, they should definitely be fitted with **the grooved side up**. If installed smooth side up, the square edges will not shed water effectively and furniture or other heavy objects dragged across the surface can result in the vulnerable edges getting damaged, splintering or breaking away.

A slight fall must always be incorporated into a decking surface for water run-off, see **Decking Installation**.

Be aware that **grooved boards do not give any additional resistance to slip**, they are **designed to channel water away from the deck**. As such they must always be **laid in the direction of the fall** and kept clear of debris otherwise standing water may encourage algal growth which creates a slip risk if not dealt with by cleaning, see **Maintenance**.



Examples of board and substructure design, image: Hoppings Softwood Products.

Board Orientation

You can lay the deck boards horizontally, vertically, diagonally or a combination of these to create variation. You can be quite creative with your deck surface - even create a juxtaposing board pattern, chevrons or a checkerboard effect, particularly if the deck area is large and single deck lengths are not long enough.

Aspects to consider:

- The design can be enclosed by a 'border' made from the same type or differing profiled or coloured deck boards.
- Boards laid perpendicular to the long edge of a deck (like a boardwalk), make the space appear wider than if boards are laid parallel.
- When laying anti-slip boards, consider the direction of the footfall traffic to achieve the greatest efficiency.
- Consider where the adjoining board ends will fall, you may need to stagger and alternate them or integrate additional timber support battens as part of the design.
- Ornate patterns created by varying orientations of boards can hinder drainage - a smooth profile board is recommended for such designs.
- The substructure will need to accommodate the surface design to ensure all boards are supported equally - see [Decking Installation: Building the Substructure](#).

Deck Types

There are four basic types of deck which are categorised (for building regulation purposes) as:

GROUND LEVEL

A platform built directly onto the ground

RAISED (LOW LEVEL)

Less than 600mm (24") from the ground

RAISED (HIGH LEVEL)

More than 600mm (24") from the ground

ROOF TOP

Decked areas on existing flat roofs

TELL ME MORE >

For more information go to the section: [Planning and Building Consent for Private Decks](#)

Types of deck

Your deck can be just about any shape - square, rectangular, circular, curved or a combination of any. Deck structures can either be attached to a property or free-standing. The complexity of build varies depending on the site (sloping, flat or uneven), height from the ground and load-bearing requirement.

Ground level



Raised (low level)



Raised (high level)



Roof Top



Planning Approval and Building Control

In general, private domestic decks do not require **Planning Approval** unless they:

- exceed 300mm in height above ground level;
- cover more than 50% of the garden area (including extensions and outbuildings);
- are within a conservation area or national park or attached to listed buildings.

Be mindful of neighbouring properties - deck location could affect their privacy or view.

It is the property owner's responsibility to find out what is and is not permitted before work commences. Always consult the Local Planning Department in the first instance; especially for decks to be used in a commercial setting such as a public house, hotel, clubhouse or residential home.

In general, decks being built within the grounds of existing properties do not need to be submitted to **Building Control** for approval of Building Regulations unless:

- the deck is 300mm or more above ground level, in which case it must be properly designed and structural calculations submitted;
- its location compromises any designated escape route or requirements for disabled access (as determined by within Approved Document M of building regulations);
- a change in level occurs within the deck area, or between the deck and the surrounding ground sufficient to require a guard rail to prevent falling (as determined within Approved Document K of building regulations).

TELL ME MORE >

To prevent excessive amounts of bird faeces on your deck, avoid locating it under trees - a perfect place to roost.

A 'parapet' is a decorative boundary or safety barrier.



Cheshire Mouldings Ltd

Design Considerations

Where the deck is situated and what it's going to be used for determines the structural requirements and influences the design, including the choice of materials.

When considering placement, ideally locate the deck where it:

- gets some sunshine but is protected from the wind;
- enhances an existing view but does not affect the privacy of a neighbour.

Avoid placing your deck:

- in permanent shade or under heavy foliage or trees, unless provisions are made for extra maintenance or preventive anti-slip measures. Fallen wet leaves and standing water (not dried by the sun) will cause algal growth and lead to slippery conditions.

Integral design features

- Timber, glass or metal parapets can both complement and add safety to your deck.

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. See [Installation: parapets, steps and ramps](#).

- To add extra functionality, consider incorporating different levels with steps, seating, pergolas, planters, lighting or a hot-tub*.



Richard Burbidge



Hoppings

*NOTE: a hot tub on decking can weigh a great deal when full - several tonnes in fact. It is therefore vital to ensure that the structure can take the weight. Timber decks with this requirement are usually purpose designed with the involvement of a structural engineer. Appropriate strength graded timber should also be used within the support structure.



Design Considerations

TELL ME MORE >

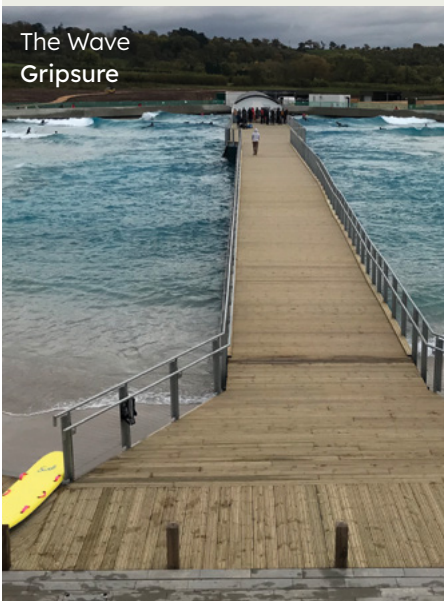
Parapets, steps and ramps

Go to this section for further detail.

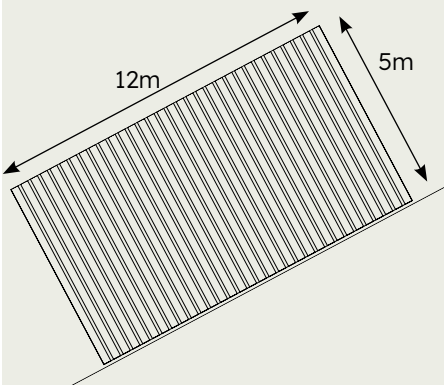
Flame Retardants

Visit the WPA's website to find independent, third party approved formulations and treaters.

www.thewpa.org.uk/flame-retardants



All drawings are for illustrative purpose only and are not to scale. The calculation opposite gives approximate figures - always obtain advice from the supplier and/or the installer.



Additional considerations if the deck is in a commercial setting:

- For safety and consequently insurance purposes, design the deck to minimise the potential for tripping, slipping and falling.
- Consider how much load will be placed on the deck at any given time. All commercial decks require a structural engineering submission.
- If there will be expected high footfall, the species of timber chosen for deck boards may need to be more dense, hardwearing and resilient to scratches and abrasions.
- Ramp access may be required for wheelchairs/bicycles/pushchairs.
- It may need to be treated with a flame retardant to conform to current Building Regulations.

**How much timber do I need?**

For simple square or rectangle deck projects, sketch out a plan and add dimensions in metres (for more complex shapes you may need the help of an installer / supplier):

1. Multiply width x length of deck area (metres) to give a measurement in sq metres.

$$\text{eg. } 12\text{m} \times 5\text{m} = 60\text{m}^2$$

2. Divide the result by the chosen board width (m) to work out how many linear metres (lm) you require (for example if the board is 145mm wide it will be 0.145m).

$$60 \div 0.145 = 414 \text{ lm (rounded up)}$$

3. Divide the linear metre figure by the length of board required (usually a choice from 1.8m up to 6m) to give you the number of boards required.

$$414 \div 3.6 = 115 \text{ boards}$$

4. Always order an extra 5 -10% to allow for wastage and mistakes - it's good to have a couple of spare boards.

Discuss the plan with a timber supplier - they should be able to recommend timber quantities for the support frame.

- Many suppliers have calculation tools on their website, specific to their products.

MATERIAL SELECTION

TELL ME MORE >

Use Classes and preservative treatments

Visit the WPA's website to learn more about the Use Class system, and the preservative treatment of wood.

www.thewpa.org.uk/make-sure-its-4



Preservative treatment is applied in a vacuum-pressure impregnation process, in large autoclaves under factory controlled conditions.

Look for treated timber with third-party verification that is fit for the end use application and desired service life.

Performance

Before we look at the individual characteristics of timber species used for decking, let's talk about general performance requirements of a material which is exposed to the elements every day of the year. When wood gets wet and stays wet, wood rotting fungi can develop and lead to decay. It is important to understand from the outset how to minimise the risk by selecting the right materials and embracing good design, installation and aftercare practices.

DURABILITY (resistance to decay and insect attack)

The service life of a deck is determined by the durability or resistance to fungal decay of the different timber components used (see [Table 1](#)). Only use timber (or timber products) capable of giving at least 15 years desired service life.

Durability performance can be either a **natural characteristic** of a particular species or it can be conferred on a **low natural durability** species by **preservative pre-treatment** or a **wood modification** process – both processes are designed to extend service life. The degree of timber's natural durability varies from species to species.

Deck boards

Timber for **deck boards** needs to be durable enough for an **exterior, above ground application**.

This is categorised in British Standards as a **Use Class 3 (UC3)** end use of wood (BS EN 335 Durability of wood and wood-based products working in tandem with the WPA Industrial Wood Preservation Code of Practice and BS 8417).



Deck substructure (posts, joists and beams)

The **substructure** should be fit for purpose and provide a service life in line with the selected deck board.

The appropriate specification is **Use Class 4 (UC4)** for exterior timber permanently exposed to wetting and/or providing exterior structural support.

The most popular choice of material for the substructure is **pressure treated softwood**, being economical, widely available at timber merchants and easy to use.



To achieve a 15 year (or more) service life expectation, select timber that is EITHER:

NATURALLY DURABLE – a timber species that has appropriate, inherent natural durability for its application and is free from sapwood (the sapwood of all species is not durable but a small amount of sapwood may be tolerated on the reverse face of a deck board).

PRESERVATIVE TREATED – timber (typically softwood) impregnated with a wood preservative in a factory-controlled process (for deck boards to a Use Class 3 standard, for posts, joists and beams to a Use Class 4 standard).

MODIFIED – timber physically modified in a process that changes its properties to enhance its durability to an appropriate level.

NOTE: Wood Treatment Use Classes are different to Natural Durability Classes (see [Table 1](#)).

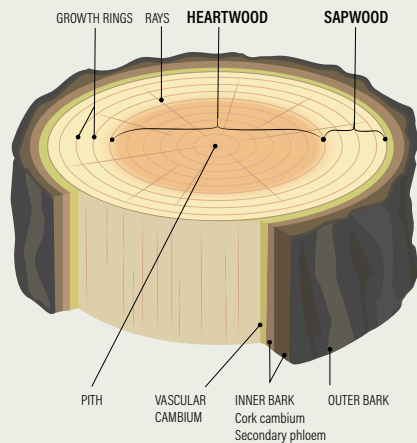
Performance

TELL ME MORE >

Heartwood vs Sapwood

The heartwood of some species contains naturally occurring chemicals that make it more durable – the ability to resist decay and insect attack.

Sapwood is a source of food for many species of fungi and insects and is ALWAYS vulnerable to attack.



Durability classifications apply to **heartwood** only; the **sapwood** of all species is not durable.

Table 1: How natural durability of heartwood relates to service life of timber components (Ref: BS8605-1)

| USE CLASS (BS EN 355) | SERVICE SITUATION | TYPICAL APPLICATION | NATURAL TIMBER DURABILITY CLASSES 1-4 (ref :BS EN 350:2016) | | |
|-----------------------|---|--|--|---------------------------------|--|
| | | | Desired service life of un-treated timber components (BS 8417) | | |
| | | | 15 years | 30 years | 60 years |
| 3.2 (U) | External uncoated: above ground. Exposed to frequent wetting. | External (uncoated) timber: deck boards, balustrades. | Durability CLASS 3 Moderately Durable | Durability CLASS 2 Durable | Durability CLASS 1 Very Durable |
| 4 | In contact with ground or fresh water. Permanently exposed to wetting and/or providing exterior structural support. | Fence posts, decking substructures: posts, beams and joists. | Durability CLASS 2 Durable | Durability CLASS 1 Very Durable | Durability CLASS 1 Very Durable (selected species) |

NOTE: The allocation of a commodity to a particular use class assumes that good design, installation and maintenance practices are taken into account. If in doubt increase the use class level by moving up to the higher rated category e.g. UC3 to UC4.

SLIP RESISTANCE

Any outdoor surface has the potential to become slippery when exposed to the weather if not maintained and timber decking is no exception.

Grip enhanced boards provide a solution, especially for public access decks, steps or ramps or high traffic areas. Slip resistance coatings are also available and should be applied and maintained according to manufacturers recommendations.



UK Slip Resistance Group

The UK's independent authority on slip resistance. For more information visit: www.ukslipresistance.org.uk



The pendulum test kit mimics the action of a foot striking a surface.

When specifying enhanced grip deck boards always make sure:

- They have undergone a British Standard Pendulum Test and a report from an independent test house is available. Pendulum testing must be carried out in accordance with the **UK Slip Resistance Group** guidelines and BS 7696-2. The foot of the pendulum is either Slider #96 to provide a result relevant to shod pedestrians or Slider #55 for bare foot pedestrians.
- They have achieved a PTV (Pendulum Test Value) of 36 or more, regarded as a low slip potential.
- Any inserts used must not protrude more than 4mm above the deck line.
- The maximum recommended gap between inserts is 70mm. This includes gaps between adjacent boards.



Cliffords Tower, York
CitiDeck (European Redwood): Marley
Photo: English Heritage

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Moisture Content

To minimise the effects of movement TDCA recommends that at the time of installation, timber decking components, including the substructure, should have a moisture content of no greater than 20%.

MOVEMENT

Wood is hygroscopic, meaning its **moisture content** is affected by changes in temperature and relative humidity of the surrounding environment. This results in movement across the grain of the timber but rarely along it.

As timber deck boards will change size as the climate around them changes, gaps left between adjacent boards to assist drainage will tend to open and become wider in the summer and close and become narrower in the winter.

Different species have different degrees of movement and this can be accommodated within the design by following the recommended installation guidance.

Like the concept of natural durability, timber has a variety of movement characteristics, classed as **small**, **medium** and **large** where small means the wood is more stable in service.

There is no requirement not to use timber with a large movement class but recognising this and accommodating for the consequence of subsequent changes in service at the design and specification stage is prudent, but experience is necessary.

- Installing timber when wet can lead to problems – the moisture content should be 20% or less.
- Ask the supplier to confirm the timber's moisture content at time of delivery.
- The moisture content of pressure treated timber will be elevated during the impregnation process. When it comes to installing, if it's higher than 20% allow it to acclimatise on site before using - see [Installation: before you start](#).
- The processes of chemically and or thermally modifying timber generally lowers the movement characteristics of the timber.



Performance

TELL ME MORE >

British Standards

BS 4978 (visual strength grading of softwood) and BS 5756 (visual strength grading of hardwood).

EN 1995 is a collection of standards known as Eurocode 5 that cover the design of timber structures, primarily used by structural engineers.



www.tdca.org.uk/suppliers/

STRENGTH GRADING

Timber intended for structural use in construction is graded, either by visual assessment or machine testing. It is then stamped as fit for purpose with the given strength class. The higher the number the stronger and more inflexible the timber.

Whilst strength grading standards aren't directly applicable to deck boards because they are installed flat, some timber suppliers do visually grade out strength reducing characteristics (such as knots).

To comply with building regulations all deck substructures should be built with strength graded timber, for softwood species:

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

Warranties, third party accreditation and proof of treatment

Many decking manufacturers and associated product and service providers offer performance warranties. Be aware, they may stipulate particular requirements and conditions of use are met in order for guarantees to remain valid - such as particular installation methods or maintenance.

It's always good practice to use products or services which have third-party certification as it's a sign of quality issued by an independent source - such as the DeckMark Quality Assessed accreditation issued by the TDCA.

Whichever materials are chosen for a timber decking project, always obtain and keep safe documented evidence of purchase - this will be useful if a problem arises.



West Midlands Safari Park
European Redwood (pine)
Classic anti-slip: Gripsure

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Coated and finished deck boards

Several companies offer a factory coating service for your chosen deck boards. Some manufacturers offer a complete coated or coloured deck product under a particular brand name - we cover some of these here: **Colour, Coatings and Inlays.**



- Although relatively heavy, WPC is generally not as strong as timber so you usually need to space your substructure joists closer together to provide adequate support.
- Some WPC material can become hot underfoot from the heat of the sun.

Timber Gallery

The following pages illustrate the most commonly available timbers and timber products used for decking, along with performance ratings and some recommendations regarding suitability for treatment, coatings and fixing.

Always ensure you are happy with the appearance quality of the material you have chosen before purchasing – most suppliers are happy to provide decking samples.

Surface appearance alters as the material matures and weathers, especially uncoated decking. For decoration or extra weathering protection **factory applied coating or finished deck board** may be specified or a coating can be applied manually on site. Coated deck boards will need maintaining so consider the budget and the manufacturers performance and servicing guidance before making a decision.

If you require a factory applied coating, always obtain a finished sample on the proposed timber species and decking profile.

The difference between Softwood, Hardwood, Modified wood and Wood Polymer Composites (WPC)

The most popular and economical decking material, **softwood** generally comes from coniferous trees which are usually fast growing and examples include **pine** and **spruce**.

Hardwood used in decking tends to come from broad leaved trees in temperate climates like **oak**, or from the wide range of tree species that grow in tropical regions of the world.

Hardwood trees tend to grow much more slowly than softwoods and as such they are typically more dense and heavier.

Generally speaking hardwood species tend to be darker in colour, close grained and more expensive than softwood (but there are exceptions).

Wood modification is a term used to describe solid timber (predominantly softwood, occasionally hardwood) that has undergone a chemical, thermal or physical process. This essentially creates a new timber product with enhanced performance properties – principally the improvement of durability.

The majority of modified woods used for deck boards are rated as Very Durable (BS EN 350 Class 1) or Durable (Class 2) and are capable of delivering a desired service life of 30 years or more when used as directed.

Depending on the species and process used, each brand of modified wood has different appearance and performance attributes and may come with a **performance warranty**.

WPC deck boards are manufactured using a mixture of wood fibre, virgin and/or waste plastic and certain additives which are melted together and extruded through an aperture plate to give the desired size and profile.

- They are manufactured to individual formulas with varying percentages of **timber content**.
- Many manufacturers offer long service life warranties - but usually this is valid only if the product is installed to their strict instructions.
- Unlike natural timber, recycling at the end of life is currently very limited.

We do not cover **WPC** brands in this Timber Gallery, however where relevant we do point out key differences to be aware of when installing.

Timber Gallery

SOFTWOODS

* Where durability class is shown as a range, the lowest durability (highest number) should be assumed unless specific information is available on the source of the wood to be used (see [Table 1](#)).
 5 = not Durable; 4 = slightly Durable; 3 = moderately Durable; 2 = Durable; 1 = very Durable

| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|--|-------------------|--------------------------|---------------------------|----------------|---------------------------|---------------------|
| | Western Red Cedar | UK | 3 | small | 330 - 390 | Specialist supplier |
| | Thuja | North American /Canadian | 2 | small | 330 - 390 | Good |

Reddish brown in colour. Stable and very light in weight. Does not contain resin and is therefore ideal for painting and staining but is equally suited to be left to weather naturally.

Take care handling as relatively soft and brittle. UK variety is knottier but is more economical than imported products. A good finish can be obtained, but cutters must be kept sharpened and care is needed in order to obtain the best results. Stainless steel fixings must be used.

| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|--|----------------|------------------|---------------------------|------------------|---------------------------|---------------------|
| | Larch Larix | European / UK | 3 - 4 | small | 470 - 650 | Specialist supplier |
| | | Siberian | 3 - 4 | small/ medium | 680 - 700 | Good |

European = Dark pink. Siberian = straw colour. Prominent growth rings, straight grained, fine uniform texture. Dense, heavy and hard wearing. Easy to machine and saw.

Heartwood is moderately durable, sometimes slightly durable.
 Is very resinous so best left natural (uncoated) but will take exterior grade oils.
 Use screw fixings as tends to split on nailing, pre-drilling recommended particularly at board ends.
Preservative treatment is recommended for Larch decking to achieve suitable durability.

| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|--|------------------|---|---------------------------|----------------|---------------------------|--------------|
| | Pine | Scots (European Redwood) Europe / UK | 3 - 4 | medium | 500 - 540 | Good |
| | Pinus sylvestris | Southern USA | 4 | medium | 650 - 670 | Good |

Generally pale in colour, ranging from yellowish - pink to reddish - brown heartwood with growth rings clearly visible. Southern has medium texture and Scots is coarse.

All varieties take nails and screws and accept decorative coatings.
Preservative treatment is required for all Pine decking to achieve suitable durability.

Timber Gallery

SOFTWOODS cont...

* Where durability class is shown as a range, the lowest durability (highest number) should be assumed unless specific information is available on the source of the wood to be used (see [Table 1](#)).
 5 = not Durable; 4 = slightly Durable; 3 = moderately Durable; 2 = Durable; 1 = very Durable

| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|--|-----------------------|--------------------------------|---------------------------|----------------|---------------------------|--------------|
| | | Sitka | 4 - 5 | small/medium | 400 - 450 | Good |
| | Spruce Picea abies | Norway (European Whitewood) | 4 | medium | 440 - 470 | Good |

No difference in colour between sapwood and heartwood, Sitka usually has a pinkish tinge, Norway colour varies from almost white to pale yellowish-brown. The growth rings are not so prominent. It has a straight grain and a good texture.

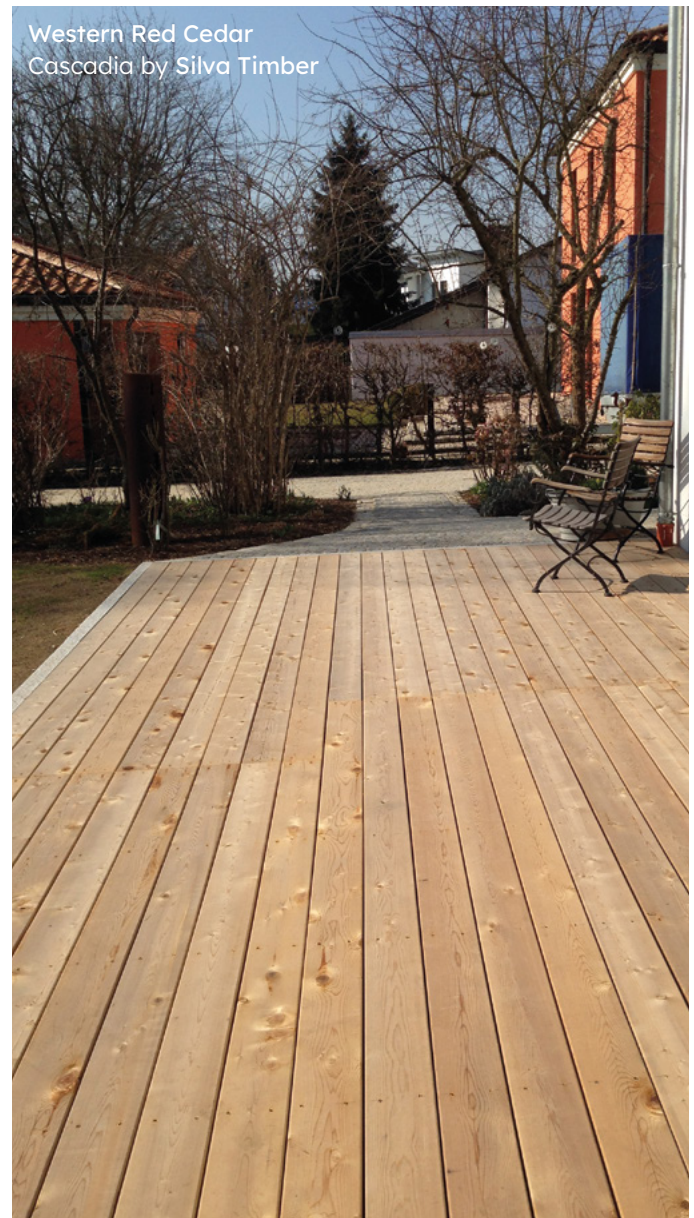
All varieties take nails and screws well and accept decorative coatings.

All Spruce decking requires preservative treatment to achieve suitable durability.

*Mechanical Incising may be required to achieve acceptable preservative penetration and retention to deliver Use Class 4 levels of performance - relevant for substructure components.



Siberian Larch
Silva Timber



Western Red Cedar
Cascadia by Silva Timber




European Redwood (Pine)
Gripdeck

Timber Gallery

HARDWOODS (TEMPERATE)

Temperate forests grow between the tropics and the Polar Regions in both the Northern and Southern Hemispheres. They generally have four distinct seasons with a well-defined winter. The UK imports temperate hardwood predominantly from Europe and North America.

| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | DESIRED SERVICE LIFE+ | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|--|-------------------------|---|---------------------------|------------------------------------|----------------|---------------------------|--------------|
|  | European Oak Quercus | English oak, French oak, Slovanian oak, Polish oak | 2 - 4 | Up to 30 years (deck boards) | medium | 650 - 760 | Good |

Heartwood is light to dark brown and distinctive from sapwood. Mostly straight grained with a medium to course texture. Quality depends greatly on the conditions of growth. UK grown timber may be available


Corrosive to metals due to acetic acid – specialist fixings recommended. Surface may be prone to leaching of extractives. Good drilling and finishing performance and machines well.

HARDWOODS (TROPICAL)


Tropical forests can be found in Central and South America, West and Central Africa and South East Asia.

Care should be taken to ensure tropical hardwood is from a legal and sustainable source. See [Responsible Timber Sourcing](#)



| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | DESIRED SERVICE LIFE+ | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|---|--------------------------|------------------|---------------------------|---------------------------|----------------|---------------------------|--------------|
|  | Balau (yellow) Shorea | Malaysia | 2 | 30 years (deck boards) | medium | 700 - 1150 | Good |

A mixture of golden browns, light browns and pale reddish-browns. Hard, heavy and strong. Moderately fine interlocking grain and even texture.

| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | DESIRED SERVICE LIFE+ | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|--|--------------------|----------------------------|---------------------------|---------------------------|----------------|---------------------------|--------------|
|  | Cumaru Dipteryx | South & Central America | 1 | 60 years (deck boards) | small | 1100 - 1150 | Fair |

Heartwood medium to dark brown sometimes with reddish or purple hue. Has a waxy / oily feel, medium texture and irregular often interlocked grain. Heavy, hard and tough.

With sharp tools it cuts and bores cleanly, and when severely interlocked grain is absent it planes and finishes to a smooth surface.

* Where durability class is shown as a range, the lowest durability (highest number) should be assumed unless specific information is available on the source of the wood to be used (see [Table 1](#)).

5 = not Durable; 4 = slightly Durable; 3 = moderately Durable; 2 = Durable; 1 = very Durable

+ **Desired service life** (out of ground contact) is indicative and based on the assumption of good design and maintenance. Relates solely to biodeterioration; other factors can limit the life of the component such as mechanical damage.

Density is an excellent indicator of wood strength; the higher the density the stronger the wood.

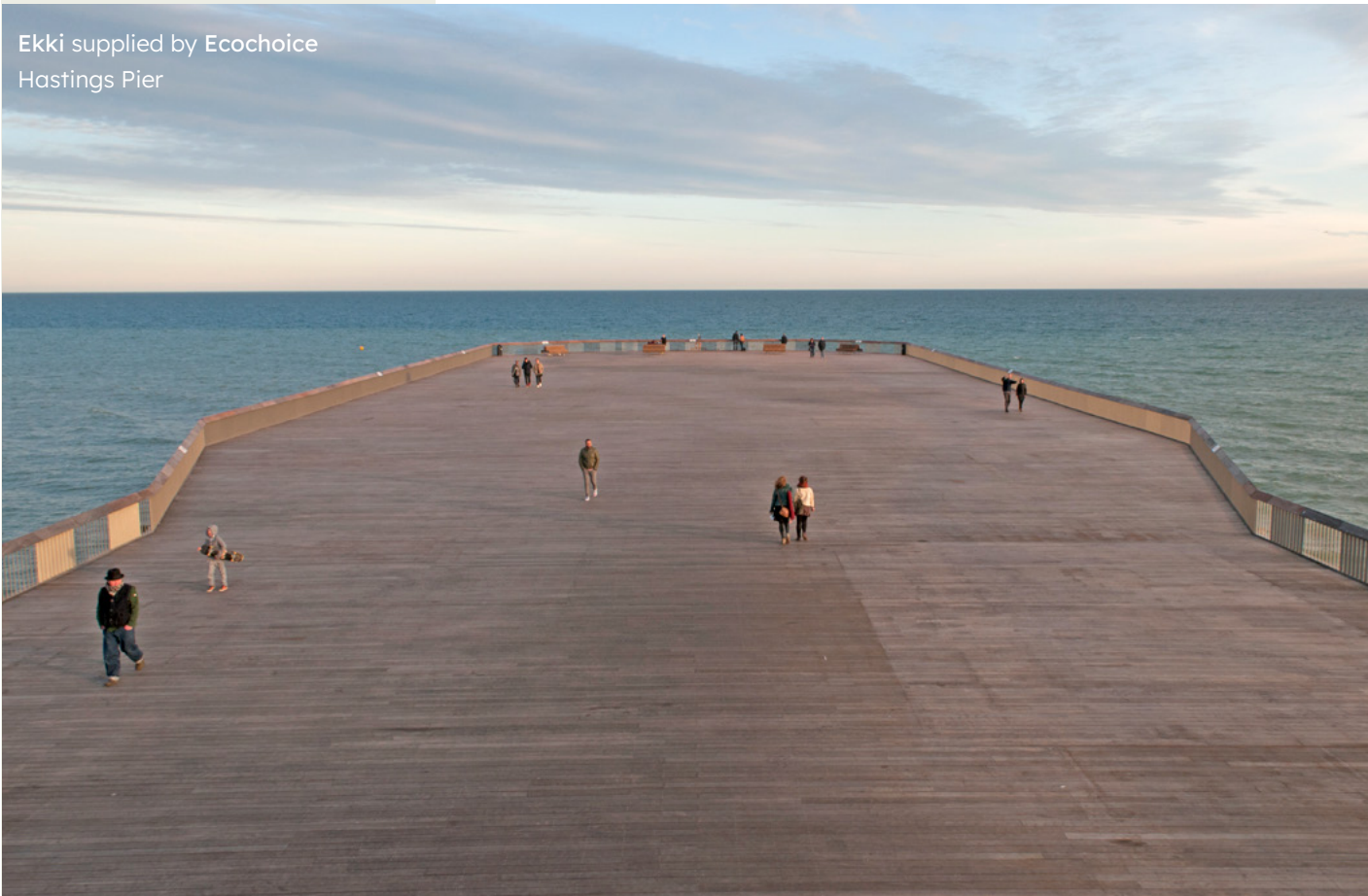
HARDWOODS (TROPICAL)



Yellow Balau
Silva Timber



Iroko
Deckbuilders Ltd

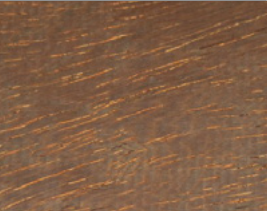


Ekki supplied by Ecochoice
Hastings Pier

HARDWOODS (TROPICAL)


* Where durability class is shown as a range, the lowest durability (highest number) should be assumed unless specific information is available on the source of the wood to be used (see Table 1).

5 = not Durable; 4 = slightly Durable; 3 = moderately Durable; 2 = Durable; 1 = very Durable

| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | DESIRED SERVICE LIFE+ | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|--|----------------|------------------|---|---------------------------|----------------|---------------------------|---------------------|
|  | Ekki Lofira | West Africa | 2 (can be regarded as 1: according to other sources, eg. USDA Forest Service). | 30 years (deck boards) | large | 1060 - 1070 | Specialist supplier |


Sapwood is pale pink and sharply defined from the heart-wood, which is red-brown to dark brown with a speckled appearance due to white deposits in the pores. The grain is usually interlocked and the texture is coarse. The wood is extremely hard and heavy.

Very difficult to work with hand tools, but can be worked by machines with less trouble.

| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | DESIRED SERVICE LIFE+ | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|--|-------------------|------------------|---------------------------|---------------------------|----------------|---------------------------|---------------------|
|  | Garapa Apuleia | South America | 3 | 15 years (deck boards) | medium | 700 - 900 | Specialist supplier |

Heartwood varies in colour from yellowish-brown to pinkish-yellow, acquiring a reddish or coppery hue after exposure. Lustrous, with a straight grain (occasionally interlocked) and fine, uniform texture. Hard, heavy, tough and strong.

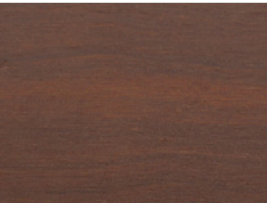
Moderately easy to work, finishing smoothly although the high silica content causes blunting to tools.

| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | DESIRED SERVICE LIFE+ | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|--|----------------------|------------------|---------------------------|--------------------------------|----------------|---------------------------|--------------|
|  | Iroko Chlorophora | Africa | 1 - 2 | 30 - 60 years (deck boards) | small | 630 - 670 | Good |

Heartwood is yellow to golden brown colour. The grain is usually interlocked and the texture coarse.

Medium workability and an excellent finish can be obtained if the grain is filled (not interlocked).

Hard deposits of calcium carbonate called 'stone' deposits, are sometimes present in cavities and often not visible but the wood around them may be darker in colour. Be aware when sawing as such deposits can blunt the cutters. Takes nails and screws well.

| | NAME/SPECIES | VARIETY / ORIGIN | NATURAL DURABILITY CLASS* | DESIRED SERVICE LIFE+ | MOVEMENT CLASS | DENSITY kg/m ³ | AVAILABILITY |
|--|---------------------------|---|---------------------------|---------------------------|----------------|---------------------------|---------------------|
|  | Massaranduba Manilkara | West Indies, Central & South America | 1 | 60 years (deck boards) | medium | 1000 - 1050 | Specialist supplier |

Heartwood is light red to rose red when freshly cut, turning dark reddish brown on exposure; sapwood whitish or pale brown, distinct, but not sharply demarcated from the heart-wood. Grain is usually straight but sometimes interlocked, texture is fine and uniform. The wood is dense and extremely heavy.

Moderately easy to work despite its high density. It machines and finishes to a very smooth surface.

+ Desired service life (out of ground contact) is indicative and based on the assumption of good design and maintenance. Relates solely to biodeterioration; other factors can limit the life of the component such as mechanical damage.

Density is an excellent indicator of wood strength; the higher the density the stronger the wood.

Timber Gallery

MODIFIED WOOD

TELL ME MORE >

Enhanced durability and stability characteristics of modified wood are a key factor in improving coating performance.

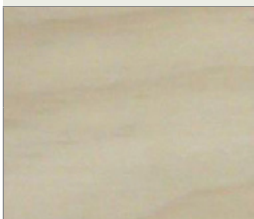
See [Colour, Coatings and Inlays](#)

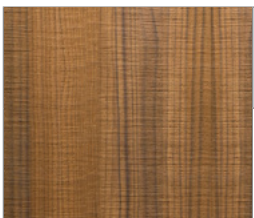
The principal aim of modification is to improve durability but dimensional stability, strength and density may also be improved or changed.


Wood modification falls into 3 process categories:

- **Thermal Modification:** a physical process such as heating or heat and pressure.
- **Chemical Modification:** a chemical process which alters the water binding cells.
- **Physical Modification:** a combination of processes that may include physical, chemical or even biological factors.

The properties and aesthetics of modified woods differ in relation to the original species, the process and variations in process. They are brand specific and it is always best practice to consult the manufacturer for up-to-date performance information.

| | BRAND NAME | MODIFICATION PROCESS | BASE TIMBER SPECIES | ASSIGNED NATURAL DURABILITY CLASS | MANUFACTURER WARRANTY (OUT OF GROUND) | DENSITY kg/m ³ | MOVEMENT CLASS |
|---|--------------|----------------------|---------------------|-----------------------------------|---------------------------------------|---------------------------|----------------|
|  | Accoya® Wood | Chemical | Radiata Pine | 1 | 50 years (deck boards) | 435 - 595 | very small |
| Light straw in colour. Outstanding dimensional stability and durability - even in ground or permanent water contact. Moisture content less than 8% | | | | | | | |
| Easy to machine and process. Appropriate coatings work extremely well - opaque finish is recommended to prevent discolouration and uneven weathering. | | | | | | | |

| | BRAND NAME | MODIFICATION PROCESS | BASE TIMBER SPECIES | ASSIGNED NATURAL DURABILITY CLASS | MANUFACTURER WARRANTY (OUT OF GROUND) | DENSITY kg/m ³ | MOVEMENT CLASS |
|--|-----------------|----------------------|---------------------|-----------------------------------|---|---------------------------|----------------|
|  | Abodo® (Vulcan) | Thermal | Radiata Pine | 1 | 15 years (deck boards) exclusions apply | 430 | small |
| Rich dark brown in colour. Virtually knot free. Good dimensional stability and durability. Low moisture content 7-9% | | | | | | | |
| Abodo should be coated with an approved protective finish. It is not recommended to leave uncoated. | | | | | | | |

| | BRAND NAME | MODIFICATION PROCESS | BASE TIMBER SPECIES | ASSIGNED NATURAL DURABILITY CLASS | MANUFACTURER WARRANTY (OUT OF GROUND) | DENSITY kg/m ³ | MOVEMENT CLASS |
|---|---------------|----------------------|-------------------------------------|-----------------------------------|---------------------------------------|---------------------------|------------------|
|  | ThermoWood® D | Thermal | Scandinavian (Scots) Pine or Spruce | 2 | 15 years (deck boards) | 350 - 480 | N/A ³ |
| Rich brown in colour. Good dimensional stability and durability. Low moisture content 5-7% | | | | | | | |
| Tends to be quite brittle, take care when handling. Nail/screw holding capability is around 20% less than usual - use stainless steel. Can be left uncoated to weather naturally. If coated, only vapour permeable, 'low- build' stains are recommended for exterior use. Note 3: Movement class information not readily available - refer to manufacturer. | | | | | | | |



MODIFIED WOOD

The Rising Path Project, Cambridge.
Image courtesy of Richard Chivers/
Smith & Wallwork.
Accoya® by Accsys, supplied by
Gripsure



Abodo®, with 'riven' effect
Glenalmond Timber.



Thermowood
Silva Timber



Adding a coating may be a recommendation of the supplier/manufacturer for a particular species.



Images left to right: transparent stain (Sikkens); clear wood oil (Owatrol); opaque deck paint (Owatrol).

Colour, Coatings and Inlays

Many decking timbers, dependant on the species, can be left uncoated - and will change in appearance with exposure to the elements (take advice from your timber supplier).

Un-coated timber usually weathers to varying shades of silver/grey.

Applying a specialist coating can help to: **counteract the weathering process** and/or; provide solutions for **protecting decks from excessive wear** and make them easier to clean or; provide **anti-slip protection** or; **add colour** or simply bring out the beauty of the timber.

When deciding whether or not to add a surface coating, consider these factors:

- **Preparation:** both new and older decks will require a degree of preparation before applying a coating. New timber tends to have a 'glaze' derived from processing at the mill which affects any type of coating absorption. Some coatings manufacturers also advise the application of a 'seasoning' product prior to adding a coating to new softwood timber.
- **Maintenance:** to keep the finish in good condition you will need to prepare the coated surface and re-coat at regular intervals as recommended by the coating manufacturer.

Choose from a variety of oils, stains and paints: some offer **water repellency** and/or **UV protection**; **translucent coatings** offer partial colour effects and **solid pigmented colour coatings** give a completely opaque look. Preservative treated timber incorporating built-in water repellent or colour additives may also be available.



Recommendations

- **Moisture permeable coatings are highly recommended – penetrating products rather than film forming.** Specially developed for external timber, they are resistant to cracking, flaking and peeling associated with more brittle varnishes or paints which can trap water under their surface.
- **Choose a product specifically designed for outdoor use on a horizontal decking surface,** resistant to scuffing by footfall.
- **Make sure the product is compatible with your chosen timber type -** hardwood, (treated) softwood, modified wood or WPC.
- **Factory applied coatings with an extended maintenance system are best for long term performance.** Some timber decking suppliers offer this service (see **Factory finished decking products**).
- **Surface coatings work best on timbers that are dimensionally stable or have a low potential for expansion and contraction as the moisture content of wood changes.** The process of preservative treating or modifying wood generally has a positive impact on coatings adhesion. Always check with manufacturer.

Factory finished decking products

Increasingly, companies are offering pre-coloured and /or textural options in their timber decking ranges . Raised grain and earthy hues in soft greys, warm browns and charcoal black are popular.

- check for how long the colour will last before it starts to fade or if any colour-fast warranties are available.
- ask if there are any touch-up or application products available to maintain the colour.



Images: IRO Timber (BSW Timber)
Heat enhanced and brushed treated softwood product which is factory coated with a water repellent cream to provide a variety of colour options.

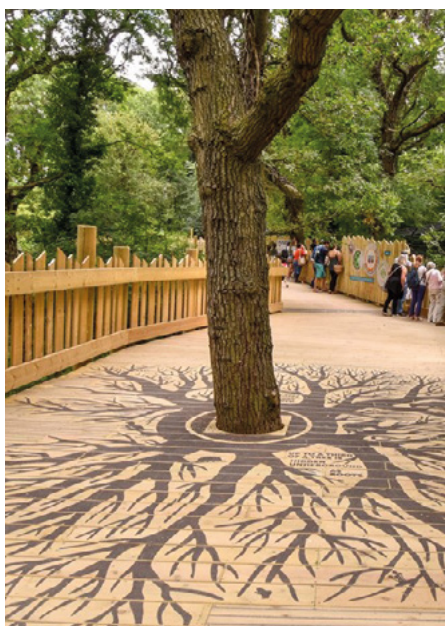
Inlays - for anti-slip or decoration

As described in the **Material Selection: SLIP RESISTANCE** section, aggregate strips are used in decking for anti-slip measures. There's a variety of colours, widths and arrangements readily available as complete deck board solutions or as individual strips for retro-fitting to existing decks.

Particular companies now offer bespoke decorative deck designs created with inlays made of the same aggregate material - providing unique personalisation or signage.



Marley
Anti-slip
Plus
Smooth



Images: Bear Wood, Wild Place Project, Bristol Zoo.
Graphic art inlay service provided by Gripsure.

DECKING INSTALLATION

Before you start

When purchasing timber from a merchant or supplier it's worth asking the supplier to confirm how the product has been stored as this could affect the quality of timber prior to installation. To preserve the quality of the wood until it is required for installation, it should be protected from precipitation, sun, dirt and ground moisture.

DELIVERY

- Plan deliveries to match the pace of production – order materials in batches.
- Prepare for the arrival and storage.
- Inspect the wood when taking receipt of the delivery – does it match what you ordered, is it in good condition?
- Put in a complaint about the wood immediately if, on delivery, it has a moisture content or grade that does not match the order.



STORAGE

- Store outdoors away from direct sunlight, rain and dirt.
- If moisture content is higher than 20% measures must be taken to allow the product to dry before installation (see below: [Moisture Content](#)).
- Choose a storage place where water will not pool under the wood, the ground should be cleared of any snow.
- Support at least 300mm off the ground, preferably not on soil to avoid splash-back.
- Lay flat, with enough clean support battens at intervals to prevent bending.
- Cover the wood (i.e. with tarpaulin) so that the air can circulate and so as to avoid high temperature or condensation.
- Ventilate between the wood and the tarpaulin and make sure that the tarpaulin ends a good way above the ground.

Moisture Content

If water has made its way into the pack, the wood must be dried before use. Break open and remove the packaging. Sticker the wood. Cover and leave to dry. Place it in an open location if during the summer. Wood that has warped should be discarded.

If possible, place indoors with a construction fan if it is a cold time of year. Check moisture content and surface moisture content before the wood is to be used.

TELL ME MORE >

To measure the average moisture content in wood, random tests on a number of pieces of wood should be conducted with a moisture meter.

Read more about moisture content here: www.swedishwood.com



Preparing the Site

TELL ME MORE >

Sustainable drainage systems (SuDS)

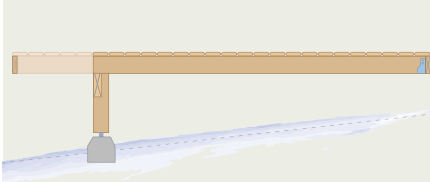
SuDS help to protect from flooding and prevent pollution. Permeable surfaces have a valuable role to play in a sustainable drainage system.

Because drainage gaps are left between boards, timber decking is an excellent choice for SuDS.

This is especially because of the likelihood of voids under the surface prior to a well compacted and permeable sub-structure that allows water to easily pass through and drain.

Read more here: www.susdrain.org

All drawings are for illustrative purpose only and are not to scale.



A positive fall away from adjacent structures or soak always should be created to prevent ponding of water under a deck.

Preparing the site

Before building your subframe, consideration should be given to the site where you plan to build your deck. If it's going to be elevated well above ground level (above 600mm) then you need only to dig the foundations for the supporting posts or piers (other methods of securing are also appropriate dependant on ground type). If it is at or near ground level (within 600mm) over lawn or soil, then certain steps should be taken to ensure a stable, free-draining and well ventilated structure can be created.



SOFT GROUND PREPARATION

- Clear all vegetation from the site (this includes grass) and at least some of the topsoil to a depth of approximately 100mm.
- If the deck is to be adjoined to an existing wall / house, a positive fall away from adjacent structures or soak always should be created to prevent ponding of water under a deck.

Position and install the support posts - see Installation: Building the Substructure

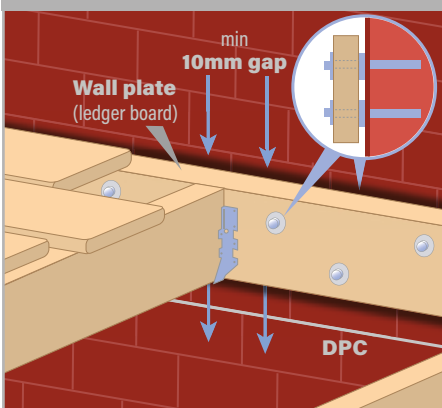
- Lay weed suppressing membrane (water permeable).
- Top with a 50mm layer of shingle or gravel and compact it to provide a firm, level free draining surface. This helps to keep membrane in place and discourages vegetation growth - it also hides the membrane if the under deck is visible.

ATTACHING A DECK TO A PROPERTY

(only if the supporting wall is structurally sound)

- Wall plates (ledger boards) are used where a deck is partially supported by and attached to a property using masonry bolts. They are made from timber equal to or greater than the size of the joist. Leave a minimum 10mm gap using washers or packing pieces between the property and the wall plate to allow rainwater to drain freely (deckboards should not be butted up to the wall, as this would close the gap already created.). Take care not to damage or bridge the damp proof course (dpc) of the property.

Wall Plates (Ledger Boards)





TELL ME MORE >

Use Classes and preservative treatments

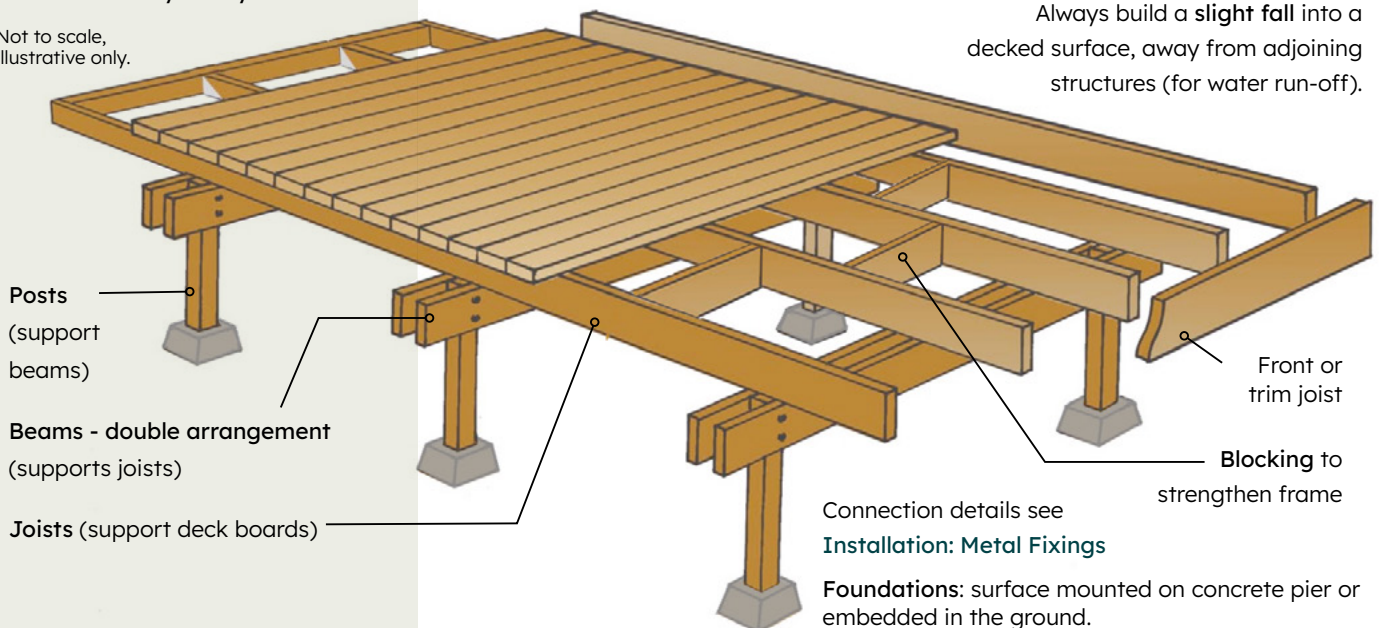
Learn more about the Use Class system and preservative treatment of wood.

www.thewpa.org.uk/make-sure-its-4

All deck substructures should be built with **strength graded** timber:

- **C16** is the **minimum strength class**
- **C24** is recommended for **decks that will carry heavy loads**.

Not to scale, illustrative only.



Building the Substructure

A substructure should be fit for purpose and match or exceed the desired service life of the selected deck board. The most popular choice of material for the substructure is **pressure treated softwood**, being economical, widely available at timber merchants and easy to use. The appropriate specification for all treated substructure components is **Use Class 4 (UC4)**.

If you buy or use wood that is not treated to the correct standard, it is likely to fail prematurely. Obtain and keep safe documented evidence of any timber treatments.

The decking substructure provides a support framework onto which the deck boards are fixed. A typical substructure comprises the following series of components:

- **Posts:** initial column supports secured onto or into the ground with foundations.
- **Beams:** an assembly of joists secured to a post to create the first support 'layer'.
- **Joists:** fixed perpendicular to the beam, they form a frame for deck boards.
- **Blocking (Noggin):** fixed in between parallel joists to strengthen the frame structure.
- **Bracing:** fixed diagonally to provide lateral stability between tall posts and frame.

The basic principles of a raised deck substructure construction

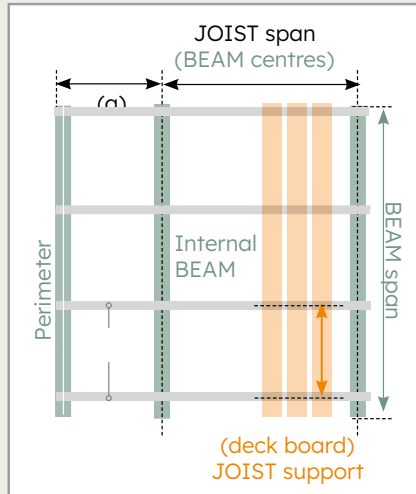
Spacing and spans

Joist and beam arrangements should provide a structurally sound support frame for the deck boards. Different spacings are required dependant on the **board timber species, component dimensions and strength grade**. **Tables 2 & 3** illustrate common span arrangements for domestic decks using treated softwood substructure components.

Refer to **Timber Decking: The Professionals' Manual (TRADA)** for further span calculations for components not shown in **Tables 2 & 3**.

- The use of **double member beams** allows wider spans to be used for the support joists.
- The joist span centres of **perimeter beams** (a) should be half that of the internal beams.

Building the Substructure



Tables 2 & 3 NOTES:

Reference: Timber Decking: The Professionals' Manual (TRADA)

These calculations assume an imposed load of 1.5kN/m²

This information is for guidance only.

For high level raised decks all calculations must be verified by an appropriately qualified engineer.

All drawings are for illustrative purpose only and are not to scale.

Table 2: Double assembly beam spans for domestic decks (metres)
Constructed with two joists 150 x 50 mm nominal (typically 145 x 45 mm finished)

| BEAM CENTRES (m) | 1.2 | 1.8 | 2.4 |
|--------------------------------------|-------------|-------------|-------------|
| Maximum effective span (BEAM) | | | |
| C16 Strength class | 2.59 | 2.16 | 1.87 |
| C24 Strength class | 2.89 | 2.51 | 2.27 |

Table 3: Maximum joist spans for domestic decks (metres)
Joist size = 150 x 50 mm nominal (typically 145 x 45 mm finished)

| JOIST CENTRES (mm) | 400 | 500 | 600 |
|---------------------------------------|-------------|-------------|-------------|
| Maximum effective span (JOIST) | | | |
| C16 Strength class | 2.97 | 2.76 | 2.59 |
| C24 Strength class | 3.32 | 3.07 | 2.89 |

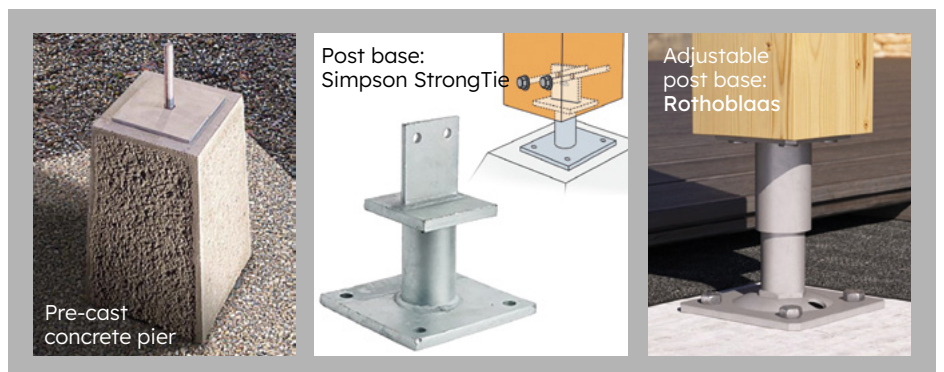
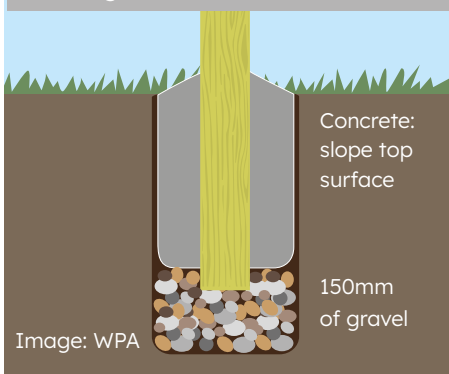
Tables 2 & 3 illustrate common span arrangements for domestic decks using treated softwood substructure components.

POSTS & FOUNDATIONS

Deck support posts are usually square but rounds may be used if appropriate to the design. Traditionally posts are solid wood but laminated columns are sometimes used, especially for high level decks where a bespoke post size may be required. Refer to [Timber Decking: The Professionals' Manual \(TRADA\)](#).

- **Posts** should have a load bearing capability/size/spacing arrangement appropriate to the scale and end use of the structure. The most commercially available decking posts for domestic projects are **100 x 100mm** (nominal size).
- Timber posts can be embedded in a hole in the ground and backfilled with poured concrete (DO NOT make a 'boot' for a post out of concrete). Ensure water can drain away from the foot of the post by adding **150mm of gravel** to the bottom of the hole for drainage. Always finish the mix level **above ground** and **slope the top surface** of the concrete to shed water away from the post.
- For extended life, keep the timber out of direct contact with the ground by surface mounting the posts on **pre-cast concrete piers** and/or **metal post bases**.

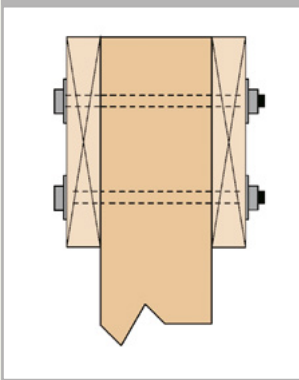
Post in ground/concrete foundation



On raised decks it is advised that support posts are not carried through the deck to serve as **newel posts** for a parapet – these should be considered as a separate component (see [Parapets, steps and ramps](#)).

Building the Substructure

Double beam arrangement



TELL ME MORE >

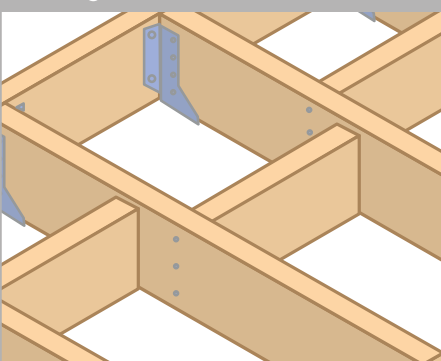
If required, main support beam assemblies may be made from double sections of the same size / strength component mechanically joined together.

Fixings

Go to the [Metal Fixings](#) section for full details.

All drawings are for illustrative purpose only and are not to scale.

Blocking reinforces the frame structure



Stagger blocking between joists for effective reinforcement and to prevent joist twisting.

BEAMS

- Beams are typically joist components attached to support posts in a double arrangement using **through bolts** with washers at the bolt head and nut.
- **Raised decks:** minimum size for each element in a **double beam assembly** is **150 x 50mm**
- **Ground level decks:** minimum size for a **single solid bearer** is **100 x 50mm** (to limit the overall depth of a low level deck, joists can be **set between the beams** rather than on top of them see [Simple ground level decks](#)).

**JOISTS**

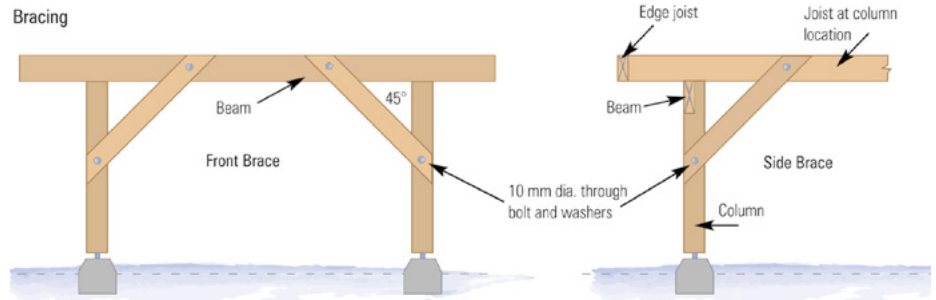
- The recommended **joist size** is **150 mm x 50 mm** or larger, installed at **400mm to 600mm centres** depending upon the size of deck board.
- As a general rule, it is good practice to **increase the frequency of the support joists** rather than the thickness of the deck board.
- When fixing a deck to a property, joists may be mounted on top of the **wall plate** or the outer perimeter beam, but not both. One end shall be face fixed (with joist hangers) to prevent turning.
- When joists are placed on top of beams they must be secured by diagonal screwing/ nailing at either side of the joist or the more preferred solution, a **metal fastener (tie)** designed for the job (the fixings used to install these should be the same metal as the tie itself to prevent galvanic corrosion).
- Joists should be offset from the beam and post positions so they can be directly fixed to beams rather than the tops of posts.
- Joists may be cantilevered over a beam by up to 30% of their permissible clear span.

BLOCKING (strutting/noggins)

- Installed between joists to further reinforce the strength of the structure and prevent joists from moving in service. Remember to treat the cross cut ends of blocks with a suitable end grain preservative.
- As a minimum requirement, all joists with a span of more than 2.5m shall be blocked at mid-span.
- Staggering blocks makes them easier to fix and helps further stiffen the frame.
- To prevent water being trapped where a block coincides with the gap between deck boards, install the blocks 5mm below the surface of the joists.

BRACING

- Should be used on all decks that exceed 1.5 m in height, whether they are free standing or attached to a property.



All drawings are for illustrative purpose only and are not to scale.



Brush cut ends of treated timber with an end grain preservative to maintain the integrity of the treatment.

Cutting support posts tops at an angle can be used as a further aid to shed water.



Preservative treated timber components

All pre-treated wood products are impregnated in their finished form and are designed to be installed without modification.

- Re-working a pre-treated timber component at the installation site should be avoided and limited to **cross cutting, boring, drilling or notching**.
- Any new exposed surfaces should be given **two liberal brush coats of a suitable end grain wood preservative**, as recommended by the manufacturer of the industrial wood preservative used in the original treatment.
- If posts are being cut to height then where feasible, the post tops should be cut **at an angle to shed water**.
- Treated wood must **NEVER** be rip sawn along its length because it will expose untreated wood that cannot be effectively re-treated on site.
- **NEVER** put cut ends in the ground, even if end grain coated.

Building the Substructure

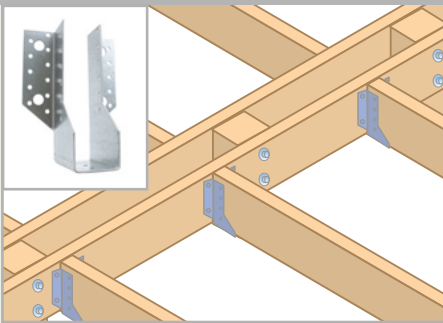
Simple ground level decks



Images: Hoppings



Joists set between beams using hangers



To limit the overall depth of a low level deck, the **supporting joists** can be set **between the beams** rather than on top of them, their top edges sitting flush with one another.

- Install the **supporting posts and foundations** and secure the beams to the posts with bolts.
- Fix the joists to the beams using stainless steel or galvanised **joist hangers** - but avoid the type that clip over the top as they can create an uneven surface and conflict with fixings used for the deckboards (see **Metal Fixings**).
- Fix the deckboards to the frame in the desired orientation (see **Laying the Deck Boards**) with suitable fixings.

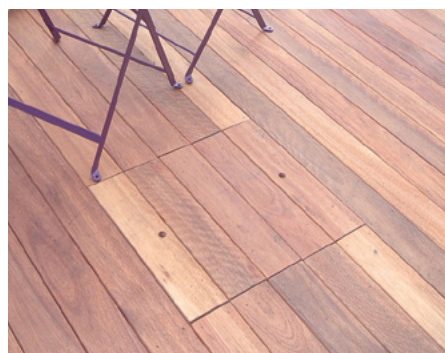
EXISTING FOUNDATIONS

If the site is a flagged or concrete patio area and the surface is sound and relatively flat, then it can be used **as a foundation** for a ground level deck.

- Create a **sturdy frame** from suitable **exterior use joists**, minimum size 100 x 50 mm (treated to Use Class 4) with appropriately spaced **blocking** for extra strength.
- If not already present, build a **very slight fall** into the frame (away from any adjacent structure) to aid water shedding.
- Secure the frame to the foundation surface using **stainless steel angle brackets and fixings** on the inside of the structure to conceal (leave a gap of no less than 10mm between frame and any adjacent property to allow rainwater to drain freely).
- The use of **adjustable supports** can help to level a site and/or create a fall - fix the support into the ground and into the bearer.



If the deck is built over any manholes or utility service points, remember to allow for this by incorporating access facilities into the design.

Adjustable supports:
Rothoblaas

Parapets, Steps and Ramps

PARAPETS

Parapets on decks can be simple decorative boundaries, such as trellis, seating, planters or full safety barriers – typically on raised structures and steps.



Potentially, any deck poses a hazard from trips and falls if the deck surface is higher than the adjacent ground level. Even a small change in height can be significant, particularly for the elderly, wheelchair users, people with mobility issues or very young children. As the deck height increases, so does the level of hazard for all users.

For all but the most basic low-level deck, a parapet or edge protection should be considered and incorporated as part of the deck structure.

TELL ME MORE >

Raised timber decks and balconies on new homes

For new homes, the **National House Building Council (NHBC)**, requires that 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: www.tdca.org.uk/publications



Building Regulations (see UK Planning & Building Regulations)

Timber decks on residential properties are not specifically referred to in current Building Regulations but it should be assumed that certain regulations do apply, particularly where safety parapets, steps and ramps are concerned.

As a general rule, Building Regulations should be taken to apply in the following situations: **decks attached to a property; decks which form a means of entry or exit from a property; raised structures.**

In terms of **parapets**, the regulations (**Approved Document K**) recommend that:

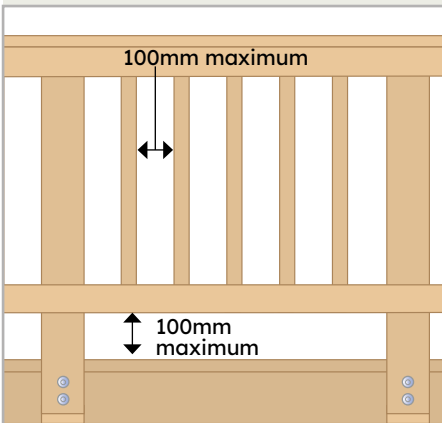
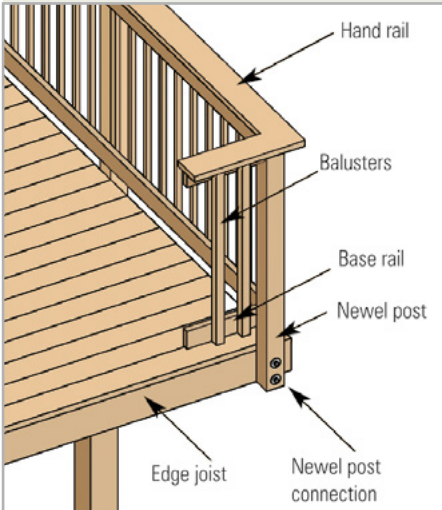
- Any (deck) structure **above 600mm in height** must be fitted with an appropriate '**guarding**' system – 'capable of preventing people from being injured by falling'.
- These (parapets) should be **1100mm in height** and be capable of withstanding particular point loads.

A minimum parapet height of **900mm** for decks below 600mm in height is acceptable under building regulations.

Increasingly, residential timber decks are being subject to Local Authority Planning and Building Control review and this may accelerate as deck structures feature increasingly on new build properties.

- All **commercial decks** require a structural engineering submission and consent from the Local Authority.

Parapets, Steps and Ramps



Secure newel post connections with bolts

All drawings are for illustrative purpose only and are not to scale.

TELL ME MORE >

Deck Parapet Design and Construction

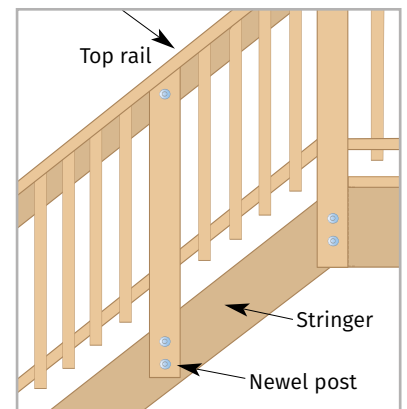
For more detail refer to the TDCA Technical Bulletin 04 www.tdca.org.uk/publications



Parapet design detail

The design and construction of a parapet should be treated as an integral part of the overall project and not a feature to be added later, especially where steps are concerned. All parapet components should be regarded as having structural significance to the overall performance of the deck – this includes fixings and all connections.

- On raised decks, **Newel Posts** must be **completely separate** from the principal deck support posts – and fixed directly to edge joist / front header joist.
- Typically, newel posts are secured using **two 10mm through bolts** with washers – **nails are not considered appropriate** for any part of the parapet construction.
- Modular balustrade systems (incorporating glass and metal balusters or panels for example), must have **third-party load testing accreditation** to confirm it is fit for purpose.
- Parapet in-fill should consist of **vertical components** or panels designed to **discourage climbing**.
- Space between components (balusters for example) should **not exceed 100mm**.
- **Cap all vertical timber components** (with handrail or post caps for example) to prevent moisture penetration of the end grain.
- If using timber, specify heartwood classified as **naturally durable** or **pressure treated to a Use Class 3** specification.
- For custom-built timber safety parapets use a minimum **C16 grade strength timber** (or hardwood equivalent) and on high level raised decks **C24**, unless all the components are part of a **strength assessed parapet system**.
- **Handrail newel posts** must always be **fixed to the stair stringer**, never to stair treads.



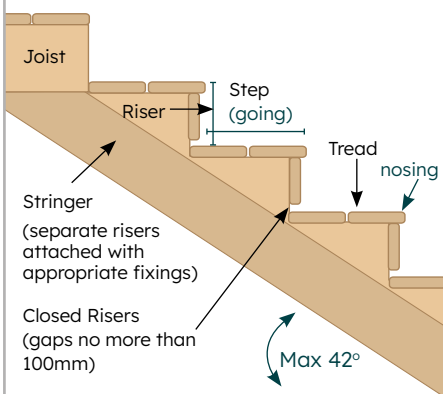
Cheshire Mouldings Ltd



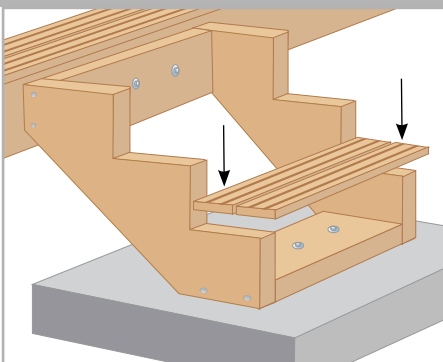
Richard Burbidge

Parapets, Steps and Ramps

Stringer, Risers, Steps and Tread



Ready-made Stringer on concrete footing



All drawings are for illustrative purpose only and are not to scale.

STEPS

Where raised decks have stairways or ramps, the installation shall be in line with **Approved Document M** (access to buildings) and where relevant **Document K** (protection from falling).

Although these regulations do differ from each other in places, depending on application, we recommend the following summarised guidance:

- Stairs for decks **up to 1.8 m in height** can be accommodated in a **single run** – but no more than 16 stair treads. For higher decks or to make stairs look less imposing, then a **half landing** or change of direction should be incorporated.
- Maximum pitch for a private stair is **42°**.
- For steps to be safe and comfortable the **riser height** and **step (going)** must maintain a consistent relationship - typical dimensions being **150 : 250mm** respectively.
- **Treads** must have a minimum **16mm Nosing (overhang)**.
- **Risers can be left open** for residential dwellings but any openings must be **less than 100mm**. Closed risers prevent the fall through of items/debris.
- Stairs wider than 900mm will need to add a **central step riser(s)** for support.
- Stairs with three or more risers **must have a graspable handrail** to one side or **both sides if wider than 1m** (see also **Parapet** section).

Ready made stringers incorporating risers are widely available. If custom made ensure appropriately durable and strength graded timber is used.

- Attach the stringers to the **outer deck joist** using **appropriate hangers** or by securing with **additional timber supports and fixings**.
- A **concrete landing pad** can be created at ground level as a footing for the stairs if not already on hard standing.
- Alternatively, two posts installed at each side with a beam in front to form the first rise can be used. The stringers are attached with joist hangers as this is subject to a vertical load.
- It is good practice to only use **solid stringers** on high level raised decks.

Typically two deck boards are laid across the riser as a tread (see **Installation: Laying deck Boards**),

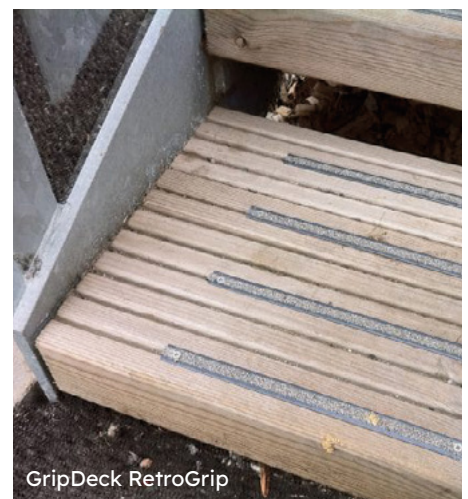
- **DO NOT rip saw to size, any preservative treated board along it's length.**
- It is a good idea to incorporate **anti-slip measures** on steps, such as boards with built-in aggregate strips (usually required on commercial specifications).



Image: Rothoblaas



Silva Timber



GripDeck RetroGrip

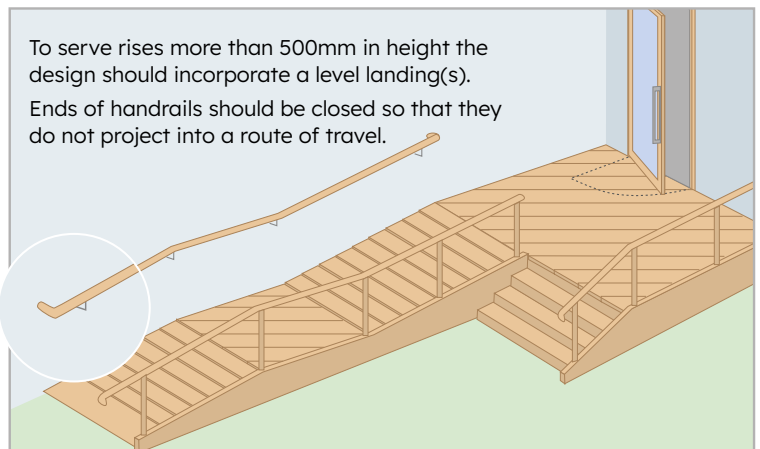
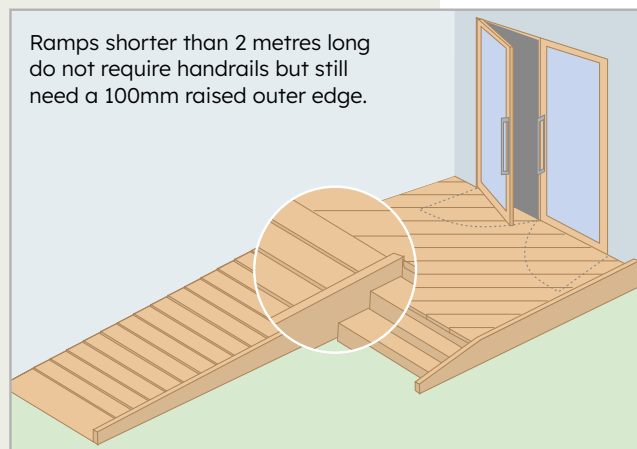
ACCESS RAMPS

Ramps are required to provide easy access to a building for wheelchairs, pushchairs, trolleys and for those people who find stairs difficult.

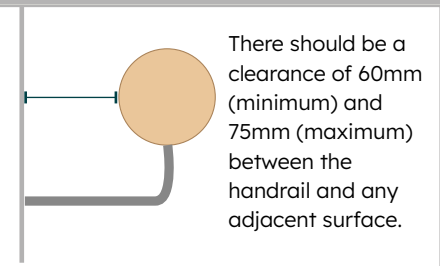
Ramp designs should enable access without the need for additional assistance.

- Gradients should be as shallow as practicable, **slopes of 1:20** or less are considered the most appropriate for all users (length is divided by height of each section).
- 5m maximum ramp length for gradients between 1 : 12 and 1 : 15
- 10m maximum ramp length for gradients between 1 : 15 and 1 : 20
- Wheelchair users need **adequate space to stop on landings and access doors** properly.

All drawings are for illustrative purpose only and are not to scale.



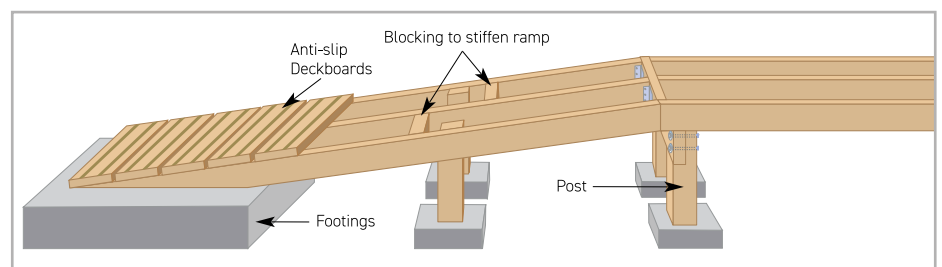
Round Handrails - 45/50mm diameter



- Top and bottom **landings minimum length 1.2m**, intermediate landings **1.5m**.
- **Minimum clear ramp width 1.2m**.
- No single ramp rise should **exceed 500mm in height**.
- A **100mm raised edge** is required on the outer side (to stop wheels slipping over and to provide a tapping edge for cane users).
- **Handrails** are required on both sides of any ramp that is **more than 2 metres** long and should be easy to grip, preferably **round (45/50mm diameter)**.
- Access steps must be provided as well as ramp where possible.
- Access should be **clearly lit** at night.

A ramp made from timber is essentially a narrow deck on an incline and the same construction principles are followed.

- Deck boards should always be installed **across the width** of the ramp - never along its length.
- **Enhanced grip boards** incorporating anti-slip strips are recommended for this application.



TELL ME MORE >

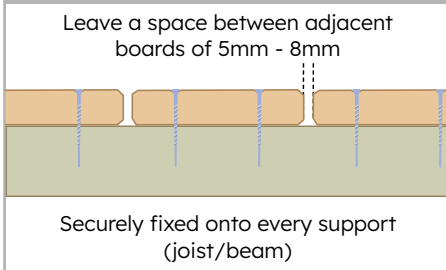
Fixings

Stainless steel ring shank nails or screws are best for deck board fixing*. Screws allow deckboards to be removed more easily for access or maintenance purposes.

*For hardwood boards, always use screws. Go to [Metal Fixings](#) section for full details.

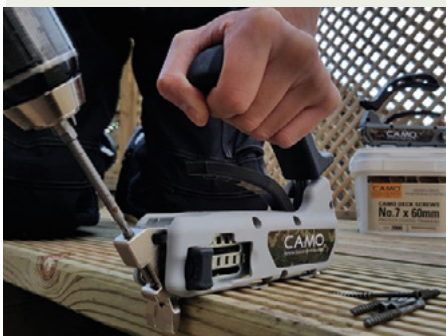
All drawings are for illustrative purpose only and are not to scale.

Spacing deck boards evenly



Pre-drilling fixing holes near the ends prevents boards from splitting.

Specialised systems allow for secret fixing.



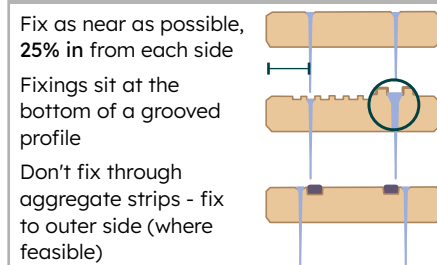
Kyocera Senco

Laying Deck Boards

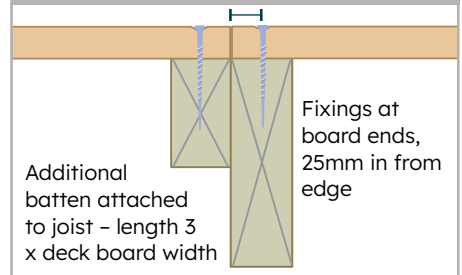
Whatever material or design pattern you choose for your deck boards, the most fundamental aspect of installation is to ensure the drainage of water from the surface. Primarily this is achieved by leaving an adequate space between the deck boards, this also accommodates the expansion and contraction of wood as it's moisture content changes with the seasons.

- For adjacent deck boards leave a **gap of between 5-8mm** (hardwood spacings differ depending on species). Using a spacer device helps with consistency.
- Board ends can be **butted** together (not tightly), but leave a **5mm space** where a board end **abuts a post**.
- Lay **grooved boards** in the **direction of the fall** (built into the substructure).
- Check the **moisture content** of the boards prior to installation and if too wet, allow the boards to acclimatise to site conditions in a sheltered area, off the ground.

Deck board fixing positions



Abutting deck boards over joist/support



FIXING

- Every point a board crosses a joist, it should be secured with **two fixings** positioned (as near as possible) at the **quarter points** of the board width.
- **Don't fix through aggregate anti-slip strips**. Fix on the outer side of the strip as close to the quarter point as possible (refer to board manufacturer's fixing instructions).
- On grooved boards, always position fixings at the **bottom of a groove**.
- Position fixings **25mm in from board end**. **Pre-drilling** helps prevent splitting.
- Make sure all fixings are **flush with the surface**, not driven below it, this can cause localised water retention. If using power tools **avoid a hammer action**.
- With **hardwood boards**, always use screws and **pre-drill** every fixing point 2mm oversize. This allows for any seasonal movement to take place without damage to the wood.
- Always locate **abutting boards over a joist** to which an additional section of joist or batten has been attached for support.
- Remember to plan where any possible joints will fall and stagger/alternate them or better still incorporate them into the design (ie. herringbone pattern).
- Deckboards should not be butted up to any adjoining wall/structure, a **10mm gap** must be left for a good flow of both air and water.

SECRET FIXING

To retain the aesthetic of the surface (hide fixings from sight) there are several systems on the market: fixings can be inserted diagonally into the sides of the board with **specialised tools** (if board depth is sufficient); **clip systems** offer alternative concealment methods.

- Clip systems may not be suitable for certain timber types.
- Always follow the manufacturer's instructions.
- Look for third-party product quality accreditation.

Metal Fixings

This section provides advice for connecting timber to timber only and covers: nails, screws, concealed clips, bolts and pre-formed connectors.

TELL ME MORE >

Corrosion is a complex subject and there are many factors that can influence the onset and rate at which metals corrode.

Metal Fixings

For more detail refer to the TDCA Technical Bulletin 08 www.tdca.org.uk/publications

Metal Fixings

The timber used for permanent outdoor structures like decks has a long life expectancy and only fixings with similar service lives should be used in their construction. Corrosion is the biggest threat to fixings used out of doors. All metal fixings - nails, screws, bolts and accessories shall be made from corrosion resistant materials.



Suitable metals



- Stainless steel (austenitic grade)
- Silicone bronze
- Carbon steel with a high performance protective coating
- Hot dipped galvanised steel (BS7371:6)
- Copper

Unsuitable metals



- Aluminium
- Electro plated metals
- Standard uncoated ferrous metals
- Brass

- The use of dissimilar metals on the same fixing point should be avoided to minimise the risk of galvanic corrosion.
- When using galvanised fixings care must be taken to prevent the coated surface being damaged by hammers or driver bits as this can lead to corrosion of the mild steel below and surface staining of the timber.

RECOMMENDED FIXING TYPES

Deck Boards

All fixings should be between 2-3 times the length of the board thickness (unless the fixing manufacturer can substantiate any different).

- **Stainless steel annular ring shank nails** are economical and less likely than standard nails to pull away, as wood expands and shrinks with the seasons.
- **Screws** provide a number of advantages over nails; they are unlikely to lift if movement takes place in the wood; are more easily removed to allow access to the under deck area; are less likely to be damaged during installation and hammer dents on the boarded surface are avoided.
- **On hardwoods or dense species softwoods, the use of screws is always recommended.** Pre-drill pilot holes with 2mm oversized clearance and countersink slightly below the surface.



Annular ring shank nails are suitable for deckboard fixing although screws have many advantages.



ForgeFast (ForgeFix)

A number of specialised decking screws are available. They include features such as self-drilling threads, self-countersinking heads and optional protective coatings. Some designs are suitable for driving straight into wood without the need for pilot hole drilling.

- Look for third-party product quality accreditation, such as DeckMark.
- Always follow the manufacturer's installation instructions.



Metal Fixings

fig 1



fig 2



fig 3



(Tite-Fix)

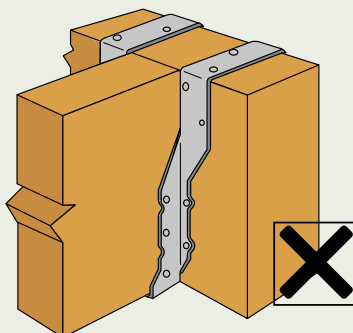
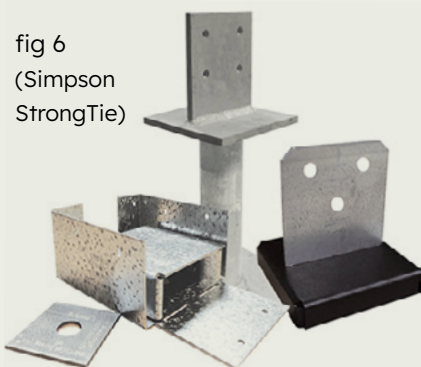


fig 6

(Simpson StrongTie)



Substructure

Where strength and safety is critical:

- **Bolts** should be 25mm longer than the combined width of the components being joined. Drill holes in wood at the same size or slightly larger than the diameter of the fixing. For best results, particularly on visible fixing points, use **dome headed carriage bolts** (Fig 1) which are **self-anchoring** when tightened.

When fixing ledger boards or wall plates to a building, **expanding or chemically secured anchor bolts** (Fig 2) are recommended.

- **Landscape screws** come in a variety of styles and are extremely useful if only one side of a component is accessible (Fig 3).

Pre-drill a pilot hole two-thirds the length of the fixing slightly smaller than the diameter of the shank of the fixing and use a washer.

The use of **pre-formed connectors** not only makes deck construction easier it also strengthens the joint between one component and another significantly and prevents any splitting of wood or weak points that can occur if only nails or screws are used. Connectors are available for almost any situation where timber components are joined. The most widely used connectors for deck construction are joist hangers, joist ties and post anchors. **The fixings used to install these connectors should be made from the same metal as the tie itself to prevent metal corrosion.**



fig 4



fig 5 (Rothoblaas)

- **Joist hangers/ties** (Figs 4 & 5) make secure joints between joists and beams or joists and ledger and are available in a number of different styles. **Avoid hanger designs with arms that wrap over the top of a joist** as these will interfere with the smooth and secure fixing of the deckboard surface.
- **Post anchors/supports** (Fig 6) are used to secure the main load bearing posts of a deck to a concrete footing or solid surface. They are also useful for keeping timber out of direct ground contact or wet conditions as an added precaution to extend the performance life of the component.

Some are designed to be embedded in wet concrete while others are for fixing to dry concrete footings, slabs or solid surfaces and can be height adjustable. In areas prone to high rainfall or where there is boggy ground or standing water use versions that lift the post clear of the ground.

MAINTENANCE



TELL ME MORE >

* If **power washing**, take care not to cause damage to the decking – adjust the power setting to 'low' and don't position the lance too close to the timber's surface.



Owatrol

Decks can easily be rejuvenated with simple maintenance techniques and specialised cleaning products.

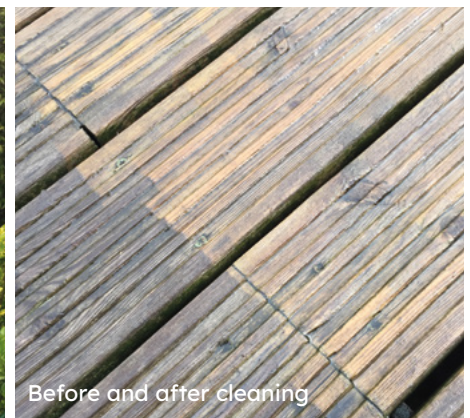
General good practice

New, well designed and constructed timber decks require little maintenance just occasional brushing to keep them clear of dirt and debris such as leaf litter. Any spills or bird droppings should be cleaned up quickly – use a proprietary cleaning product if required. As the deck gets older and more exposed to the elements, performing a regular clean once or twice a year is good practice, followed by the optional application of a surface treatment. Slippery decks are simply the result of surface deposits such as mildew, algae and fine mosses which develop in wet conditions but which routine cleaning would help to prevent.

Periodic inspections should be carried out to check if any repair work is needed – especially to the substructure which is safety critical. The following routines can be carried out by the home owner or if you prefer, specialist deck installers do offer maintenance and cleaning services.

REGULAR CLEANING

- Using a stiff broom, scrub the surface with a mild soap solution then rinse with water (alternatively use a specialist cleaning agent).
- **Power or jet washing*** is also an easy and effective way of cleaning but be careful.



DEEP CLEANING AND SURFACE PREPARATION

- To deal with badly discoloured wood or grease marks or if you need to remove previous traces of paint or stain, use a proprietary surface cleaner/stripper. These are generally rolled or brushed evenly over the surface and, after waiting for the specified time, rinsed with clean water. Be sure to choose a product which will not affect surrounding grassed areas or wildlife and which is appropriate to the timber species of the board (always follow the manufacturer's guidance).
- There are many solvent-free cleaning products on the market which are also biodegradable. Look for DeckMark approved products.
- A 'neutraliser' and/or 'priming' product may be required after stripping products have been applied and before a final finishing product.



Once the deck is clean and dry, a surface treatment can be applied to:

provide weather resistance; enhance the natural shade of the wood; give the deck a brand new look. Surface treatments range from clear waterproofing sealants to tinted and solid stains (see **Colour, Coatings and Inlays**).

RESPONSIBLE TIMBER SOURCING

The UK timber industry has a great responsibility in advocating timber as a legal, sustainable and renewable resource. This encompasses the purchasing and selling of ‘certified’ timber products – supporting responsible sourcing and good forest management.

Certification is a process that results in a written statement (certificate) stating the origin of the wood and its status, following validation by an independent third party. Certification allows buyers to identify products made with timber from legal and sustainably managed forests. Certification also allows merchants to better manage risk in their supply chains.



Certification of forest management includes inventory, management planning, silviculture, harvesting, road construction etc., as well as the environmental, economic and social impacts of forest activities. It takes place in the country of origin.

Chain of Custody certification covers the supply chain of domestic and export markets.

The UK Government recognises two certification schemes as equal: the **Forest Stewardship Council (FSC)** and **Programme for the Endorsement of Forest Certification (PEFC)**.



Always purchase accredited material from sources who can verify the legality of the product.

- ask to see evidence of the **Certification claim** for the product. This forms an important part of the due diligence exercise (Risk Mitigation) under the EU/UK Timber Regulation (UKTR/EUTR) see the **TDUK Due Diligence Toolkit**.

Responsible Purchasing and TDUK members

Timber Development UK (TDUK) has developed a **Responsible Purchasing Policy (RPP)** which is a risk management framework in line with the requirements of the **EU/UK Timber Regulation (EUTR)**. Adhering to the policy is a mandatory aspect of TDUK membership. Each Operator member submits evidence to annual independent scrutiny to ensure that they have Due Diligence Systems in place in line with the Regulation. The RPP framework has also been adapted for higher risk products and countries to allow for a reviewing process to ensure correct understanding and compliance with other regulatory requirements such as the **Construction Products Regulation (CPR)**.

All information given here is correct at time of publication. Such regulation may be subject to change - always refer to the current national Building Regulations.

UK PLANNING AND BUILDING REGULATIONS

TELL ME MORE >

All commercial decks require a structural engineering submission and consent from the Local Authority.

Table 4

Consent for Private Decks

PLANNING PERMISSION

All building work carried out in the UK requires government approval before it can commence. Parliament has delegated this responsibility in the main to the planning department of local councils. However, certain types of building work can be carried out without the need to apply for planning permission under what is called 'permitted development rights' set by the Government.

Private decks are considered permitted development, not requiring local council planning consent - however the rules do vary slightly depending on where you live in the UK.

Table 4 shows the key permitted development rules for decks currently in place in England & Wales, Scotland and Northern Ireland.

Decks do not require planning consent so long as they comply with the following rules, if in doubt consult your local council planning department.

| England & Wales | Scotland | Northern Ireland |
|--|--|--|
| The deck platform is no more than 30cm above the ground at its highest point. | It's located at the back of your house. | The deck platform is no more than 30cm above the ground at its highest point. |
| Together with other extensions to the property and outbuildings like garages, the decking does not cover more than 50% of the garden area. | The height of the floor level isn't any higher than 0.5 metres above ground level. | The deck or raised platform is not in front of the principal or side elevation of the house that faces onto a road. |
| No part of the deck is on land forward of the front wall of the house. | The total height, including any attached structures or roof, isn't any higher than 2.5 metres above ground level. | If you live in a house within a Conservation Area no part of the deck or raised platform is situated between a wall forming the principal or side elevation and the property boundary. |
| The deck is not situated within 20 metres in line of sight of a highway. | If it's within the grounds of a listed building or within a conservation area, the footprint doesn't exceed 4 square metres. | The total height, including any attached structures or roof, isn't any higher than 2.0 metres above ground level. |
| The structure or its use would not affect the amenity value or privacy of neighbouring properties. | The structure or its use would not affect the amenity value or privacy of neighbouring properties. | The house is not a 'listed' building. |
| The house is not a 'listed' building. | | |

Planning and Building Regulations consent for decks

For more detail refer to the TDCA Technical Bulletin 02 www.tdca.org.uk/publications



Designated area restrictions

In some areas of the country, known generally as 'designated areas', permitted development rights are more restricted. The local council planning department must always be contacted if the house where the deck is to be built is in any of the following:

- a Conservation Area
- a National Park
- an Area of Outstanding Natural Beauty
- a World Heritage Site
- the Norfolk or Suffolk Broads

TELL ME MORE >

England & Wales

www.planningportal.co.uk

Scotland

www.mygov.scot/add-decking-house

Northern Ireland

www.nidirect.gov.uk

How to avoid planning problems

Serious consequences can result if the planning considerations are not observed. For example, the local council can issue an 'Enforcement Notice' insisting that a structure be modified or dismantled and removed if it considers they should have been consulted or planning permission should have been obtained, but was not.

Whilst it is possible to make a retrospective planning application, they are rarely successful. Neighbour objections are the most usual reason for planning refusal or approval conditions.

Legal responsibility

It is the legal responsibility of the homeowner(s) to ensure that local council planning requirements are considered and acted upon and that any conditions that may have been attached to an approval are complied with fully.

- Homeowners may appoint an 'agent' to deal with the local council on their behalf.

Planning application costs

Where planning approval is required, homeowners will need to provide the following as part of their submission:

- Creation of a **detailed architectural drawing** of the deck; a **specification of the materials** to be used and their load bearing capabilities and, a **site plan** showing the **location of the deck** in relation to the house and neighbouring property;
- **The planning application fee.**

BUILDING REGULATIONS

Building Regulations are legal requirements aimed at ensuring adequate standards are followed in construction projects to make the finished job safe for people to use.

Timber decks on residential properties are not specifically referred to in current Building Regulations but it should be assumed that certain regulations do apply – particularly where **planning permission** is required.

It is good practice to adhere to such regulations regardless of planning requirements, especially where: **decks are attached to a property; decks form a means of entry or exit from a property; decks are raised structures.**

The rules governing **strength grading** of timber are prescribed in British standard **BS EN 14081:2005**. In relation to timber decking:

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

The rules governing **access to buildings** are prescribed in **Approved Document M**.

The rules governing **protection from falling** are prescribed in **Approved Document K**.

- In relation to decking these rules apply particularly where **safety parapets, steps and ramps** are concerned. We detail the recommendations from these documents in the relevant sections of this handbook.

Fire Safety

The rules governing **fire safety** are prescribed in **Approved Document B**

- Depending on its situation, particularly for commercial applications, UK Building regulations may stipulate that the timber decking is protected with a suitable flame retardant product.



All information given here is correct at time of publication. Such regulation may be subject to change - always refer to the current national building regulations.



bsi.shop

The Standards shown here can be purchased and downloaded from the British Standards Institution online facility: shop.bsigroup.com

British Standards relating to decking specification

| | |
|-------------|--|
| BS EN 338 | (2016) Structural timber. Strength classes. |
| BS EN 350 | (2016) Durability of wood and wood-based products. Testing and classification of the durability to biological agents of wood and wood-based materials. |
| BS EN 335 | Durability of wood and wood based products. Use classes: definitions, application to solid wood and wood-based products. |
| BS 8417 | Preservation of wood. Code of practice |
| BS EN 942 | Timber in joinery. General requirements. Specifies the general requirements including in particular the grading and classification by appearance quality of timber in joinery products or individual joinery parts. |
| BS EN 1310 | Round and sawn timber. Method of measurement of features. |
| BS EN 1995 | A collection of standards known as Eurocode 5 that cover the design of timber structures, primarily used by structural engineers. |
| BS EN 3506 | (2009) Mechanical properties of corrosion resistant stainless steel fasteners. |
| BS 4978 | Visual strength grading of softwood |
| BS 5756 | (2007+A1:2011) Visual strength grading of hardwood. Specification. |
| BS 6180 | (2011) Barriers in and about buildings. Code of Practice. |
| BS EN 14081 | (2005) Timber structures. Strength graded structural timber with rectangular cross section |
| BS EN 16737 | (2016) Structural timber. Visual strength grading of tropical hardwood. |

ADDITIONAL SOURCES OF INFORMATION

All free to download at the TDCA website:
www.tdca.org.uk/publications

All free to download at the WPA website:
www.thewpa.org.uk/resource-centre

Wood campus

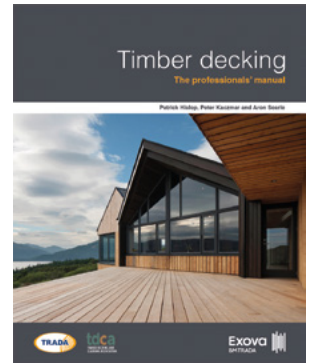
Visit www.woodcampus

The courses can be accessed without registering – completing in one go or dipping in and out. Once a course is completed and assessment passed, the CPD certificate can be downloaded.

Technical publications

Timber Decking - The Professionals' Manual
 (3rd edition 2018) TRADA

A definitive industry guide to the specification, design and installation of timber decking in the UK. It covers both domestic and commercial situations and includes span tables for commonly used species and profile sizes. Available to buy from the TDCA website.



Timber Decking & Cladding Association (TDCA) Codes of Practice:

Raised timber deck structures on new homes
Balconies on new homes – desired service life 60 years

Produced by the Timber Decking and Cladding Association to meet the installation and performance requirements specified in NHBC home building standards.



TDCA Technical Bulletins

A series of concise and informative documents covering topical decking subjects.

- TB02: Planning and Building Regulations consent for decks
- TB04: Parapet design and construction
- TB08: Metal fixings

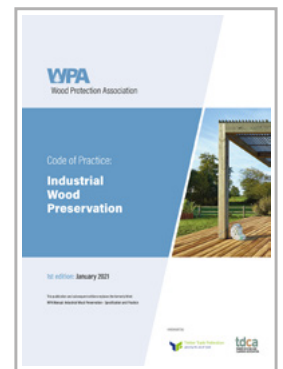
The Wood Protection Association (WPA)

Code of Practice: Industrial Wood Preservation

A valuable and current reference of standards and good practice for treaters, specifiers and users of treated wood.

Guidance Notes : Preservative treatments

The Wood Protection Association and Timber Development UK (formerly Timber Trade Federation) have produced a series of resources aimed at educating the treated timber supply chain and the wider specification market.



Free on-line training courses - Wood Campus

Deck Design and Installation: CPD Accredited Course

In partnership with the TDCA, the course is accredited by RIBA (the Royal Institute of British Architects) and covers all the important issues you need to be familiar with if you are specifying timber decking, from durability to design and aftercare.



Procuring Sustainable Timber: CPD Accredited Course

This CPD feature has been produced by Wood Campus in co-operation with Timber Development UK and accredited by RIBA. It covers all the important issues you need to be familiar with if you are to procure this most sustainable of materials responsibly.



Visit www.tdca.org.uk

Design inspiration

There's a wealth of timber decking inspiration and reference featured in the [Case Studies](#) and [Gallery](#) pages of the The Timber Decking & Cladding Association (TDCA) website.



Technical Advice

There a number of publications, free to download at the TDCA website in addition to many other resources - including common frequently asked questions with answers (FAQs). You may get in touch with their timber decking experts by phone or email too.

Find an accredited supplier or installer

The TDCA administers the [DeckMark Quality Assurance Schemes](#) for timber decking suppliers, products and installers. Such verification provides end users with the confidence that the products they buy or the contractors they employ, meet particular industry recognised standards.

To ensure standards of performance are maintained, the accreditation of an individual firm is audited and renewed every 12 months by an independent inspector appointed by the TDCA.

You can quickly and easily source your nearest supplier of timber decking and associated products and services with the on-line [Supplier Database](#) and you can filter your search to find exactly what you're looking for.

Decking training resources from product suppliers

Several TDCA members provide training on general decking topics as well as specific product training - get in touch with the TDCA for more information.

Inspection and expert witness services

To help resolve difficulties with timber decking projects, the TDCA offer a number of expert services to private home owners, architects, surveyors, structural engineers.

Such services include:

- General condition surveys and maintenance reviews.
- Assessing material faults and possible causes on site.
- Advising on correct material specification and good practice standards.



CHECKLISTS



Key points for specifiers, buyers and installers

COMPLIANCE

Check if planning permission is required before starting the project – this includes the location, size and type of deck to be built.

Refer to current Building Regulations regarding materials, design (including access facilities) and construction techniques.

MATERIAL CHOICE

The timber you choose for your project needs to be either naturally durable to meet the desired service life required (a minimum 15 years) or should be preservative treated to the correct Use Class level.

All timber substructure material should be durable enough to withstand in-ground contact conditions – if treated softwood this should be to Use Class 4 levels.

Wood weathers with external exposure, consider this when selecting your timber type and if you choose a coating or finishing product be aware of maintenance requirements.

Always purchase accredited material from responsible sources who can verify the legality of the product. If in doubt, ask to see certification.

DESIGN

Make sure the design and installation will ensure free draining and good ventilation.

Avoid placing the structure directly under trees or heavy foliage unless it can be given extra maintenance.

Consider the use of anti-slip measures, especially on steps or access ramps.

Don't locate the deck where it might obstruct the view of a neighbour or intrude on their privacy.

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 project.

INSTALLATION

When storing timber, to preserve the high quality it should be protected from precipitation, sun, dirt and ground moisture prior to installation.

Timber should be supplied/used with a moisture content no higher than 20%.

Only use fixing types which are suitable for the wood species used and for exterior use, ensure they are made of corrosion resistant materials.

Every point a deck board crosses a joist, it should be secured with two fixings positioned at quarter points of the board width and 25mm in from each end (unless using a secret fixing system). Pre-drilling these fixing points will help prevent splitting.

If you cross-cut any pressure treated timber on site, coat the cut ends with brush-on end grain wood preservative to maintain the integrity of the treatment.

MAINTENANCE

Keep the deck clean and free of debris, get into the habit of cleaning once or twice a year.

Periodic inspections should be carried out to check the decking structure and to identify if any repair work is needed.

KEEP ALL RECORDS OF PURCHASE OR SERVICE, SAFE AND ACCESSIBLE.

GLOSSARY OF TERMS

| | |
|-----------------------------|--|
| Anti-slip | A measure to provide slip resistance, usually in the form of aggregate strips embedded into the deck board. |
| Baluster | The vertical component of a parapet system. |
| Beam | Secured to the posts, they provide the first support 'layer' onto which Joists are attached. |
| Blocking | Fixed in between the parallel Joists to strengthen the frame structure. Can also be known as 'noggins'. |
| Bracing | Part of the decking substructure, they are fixed diagonally to provide lateral stability to tall columns. |
| Chamfer | To remove top or bottom edges lengthwise at an angle. |
| Countersink | To cut a recess that allows the head of a screw to lie flush with a surface. |
| Cup | To bend as a result of shrinkage, specifically across the width of a piece of wood. |
| Density | The mass of a unit volume of wood at a specified moisture content. Density is an excellent indicator of wood strength; the higher the density the stronger the wood. |
| Desired Service Life | (DSL) The number of years a timber component can be expected to perform assuming good design, treatment specification and correct installation practices are used. |
| Distortion | The change in the shape of a piece of timber or timber-based material brought about by shrinkage as the timber dries. It includes bowing, twisting and cupping. |
| Durability | Resistance to decay or insect attack. Durability can be either a natural characteristic of a particular species or it can be conferred on a species by preservative pre-treatment or a wood modification process. The degree of timber's natural durability varies from species to species. |
| End grain | The exposed face of timber produced when it's cut through a plane that's perpendicular to the grain. |
| Flame Retardant | Treatments that enhance the 'reaction to fire' properties of wood and wood - based materials. Generally work by reducing ignitability and the surface spread of flame, heat and smoke release, providing vital extra time for a safe escape. |
| Hardwood | Wood of trees of the botanical group 'dicotyledons'. Grown in both temperate and tropical climates. The term 'hardwood' is historical and does not imply that timber from these species is necessarily harder than from a softwood species, nor should it be assumed that all hardwood species have a high natural durability. As with all wood species consideration must be given to the legality and sustainability of the wood products. |
| Heartwood | Inner zone of a tree trunk that, when the tree was alive, provided structural support but no longer contained living cells. The heartwood may be darker in colour than the outer sapwood though not all species show a clear difference between the two. The heartwood is often more durable than sapwood. |

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| Impregnation | A method of application associated with industrial timber treatments whereby the formulation is forced under pressure into the timber cells. |
| Joist | Part of the decking substructure, an arrangement of joists form the frame for the deck boards to be attached, they are usually fixed perpendicular to the beams. |
| Mitre | Two pieces forming an angle, or a joint formed between two pieces of wood by cutting bevels of equal angles at the ends of each piece. |
| Modification | A term used to describe solid timber (predominantly softwood, occasionally hardwood) that has undergone a chemical, biological or physical process. This essentially creates a new timber product with enhanced performance properties – principally the improvement of durability. |
| Moisture content | Mass of moisture in wood expressed as a percentage of its oven-dry mass. |
| Movement | The expansion and contraction of wood as a result of changing moisture content. Movement in length is always negligible. Movement parallel with the growth rings is greater than at right angles to them. The degree of movement varies between species. |
| Newel (post) | Vertical components of a parapet system, onto which top and bottom rails are affixed. |
| Noggin | Timber component fixed in between the parallel joists to strengthen the frame structure. Can also be known as 'blocking'. |
| Nominal (size) | Dimension of a component prior to machining to its actual final size. |
| Parapet | Decorative boundary or safety barrier, usually comprising newel posts, balusters, top and bottom rails/handrail. Can be pre-made panels. |
| Permeability | The ease with which liquids - such as preservatives or flame retardants - can be impregnated into timber. Permeability varies with species, although the sapwood of all species is more permeable than the heartwood. |
| Post | Part of the decking substructure, initial column supports secured onto or into the ground with foundations. |
| Preservative | An industrially applied timber treatment product which confers added durability. |
| Rail | Horizontal component of a parapet system, top and bottom rails are fixed in between the newel posts to form a frame for the balusters to be affixed. |
| Rip-sawn | To cut wood along the length of the grain. |
| Sapwood | Outer zone of a tree that when the tree was alive, contained living cells. It provides a source of food for many species of fungi and insects and is always vulnerable to attack from biological organisms. |
| Softwood | Wood, whether soft or not, from trees of the order 'Gymnospermae' (see Hardwood definition). Most commercial timbers of this group belong to the botanical class 'Coniferae' (conifers). |



| | |
|---------------------|--|
| Spans | The spacing of joist and beam arrangements to provide comprehensive support for the deck boards. Different spacings are required dependant on the board timber species and component dimensions. |
| Substructure | Support framework onto which the deck boards are affixed. A typical substructure comprises posts, beams, joists, and blocking. |
| Use Class | The British Standard for wood preservation – BS 8417, recommends that the loading and penetration of preservative, impregnated into wood, is tailored to the desired end use. So it groups the applications for treated wood into Use Classes. |



**TIMBER
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