TIMBER DEVELOPMENT UK

Build

B.60.01-02

Date Published
1 October 2024

Document Type
Timber Knowledge Sheet

Category
Build

Audience Designer | Manufacturer | Contractor

Theme
Applications

Author
Kirsty Connell-Skinner for TDUK

Cover image
Luke O'Donovan

KNOWLEDGE LIBRARY

Timber Landscape Architecture

Specifying timber products for landscape architecture projects adds natural and durable aesthetics to shape and define social spaces where people live, work, and play.

Date Published 1 October 2024 | **Document Type** Timber Knowledge Sheet | **Category** Build | **Audience** Designer | Manufacturer | Contractor | **Theme** Applications | **Author** Kirsty Connell-Skinner for TDUK

Timber Landscape Architecture

Timber's natural aesthetic harmonises with landscape design, while specifying durable timber products can enhance public spaces within towns and cities.

Landscape architecture encompasses the constituent features used in public environments such as parks, gardens, and city precincts. These can include:

- **Walkways and boundaries**, such as fencing, gates, stairs, ramps, boardwalks, bollards, handrails, and footbridges
- **Shelters**, including bus stops and pergolas
- **Fixed items**, like picnic tables, benches, decking, planters, and signs and signposts.

Timber used in landscape architecture needs appropriate material selection and design detail to maximise service life.

Specification for a long service life therefore depends on an understanding of timber properties to ensure it is detailed and used appropriately outdoors.

Durability

Different timber species are ranked in five categories of "natural durability" (ability to resist decay) by **BS EN 350 Durability of wood and wood-based products**.

Durability Class	Description	Average Service
1	Very durable	25 years +
2	Durable	15 - 25 years
3	Moderately durable	10 - 15 years
4	Slightly durable	5 - 10 years
5	Not durable	< 5 years

The average service life is based on testing the longevity of 50mm x 50mm timber stakes set in the ground at test sites, to mimic what is experienced by landscape timber products in ground contact.

Durability	Example species
1 - very durable	Teak (*Tectona grandis*)
2 - durable	European oak (*Quercus robur*)
3 - moderately durable	Douglas fir (*Pseudotsuga menziesii*)
4 - slightly durable	Scots pine (*Pinus sylvestris*)

Teak (*Tectona grandis*) and other tropical hardwoods are very durable, making them the preferred choice for handrails and giving improved wear resistance on steps and boardwalks. Their high durability means they do not require preservative treatment. However, the high comparative cost of tropical hardwoods compared to other timber species with lower durability ratings may make their use uneconomic in landscape architecture.

Softwoods, like Douglas fir (*Pseudotsuga menziesii*) and Scots pine (*Pinus sylvestris*) can provide both economic and aesthetically pleasing landscaping results, provided such softwoods are preservative-treated to extend their durability.

Some timber species, including Oak (*Quercus spp.*) and Douglas fir (*Pseudotsuga menziesii*) can accelerate metal fixings' corrosion. Greater protection and longer service life can be achieved by specifying a suitable grade of stainless steel for fixings such as plates, brackets, and nuts and bolts.

Preservatives

Timber landscape architecture products in contact with the ground, formed from species that are moderately durable or less, must have an industrial factory-applied preservative treatment.

For uses above the ground, moderately durable species exposed to standing water on horizontal surfaces - such as seating, tables, decks, and walkways - should also receive preservative treatment.

The level of treatment in the loading and penetration of the preservative required is tailored to the desired end use. The preservative must be suitable for exterior use as well as being permanent, insoluble in water and safe. It should leave the timber clean to touch, and compatible with finishes.

Moisture

Timber used in landscape architecture is usually fully exposed to the weather and to a wide range of humidity over time. The moisture content (mc) can therefore vary from below 12% to above 20% during the course of the year (dependent on the degree of exposure and orientation). Timber components should therefore be installed at an mc below 20%.

Seasonal variations in mc will also cause dimensional change in section sizes, known as natural movement. These should be allowed for in structural joints, fixings, and abutments between components like decking boards.

Timber Finishes

Variation in finishes for exposed external timber includes the following:

- **Naturally weathered**

Unfinished timber that weathers down to its natural light grey colour when exposed to sun and rain. While some fissuring or surface roughness can occur, most timber products weather well in a clean environment, without serious degradation.

Preservative treatment does not inhibit timber weathering and allows plentiful lower durability species to be used in landscape architecture. As unfinished timber absorbs or loses moisture more quickly than finished, it could result in discolouration due to surface fungal growth, which can be removed with cleaning agents or power washing.

- **Translucent finish**

This coats the timber while retaining its natural texture, grain, and figure. It reduces the effects of weathering and - when a pigmented stain is used - could lessen bleaching. Translucent coatings tend to have lesser adhesion on denser timbers, requiring more frequent maintenance, which is why hardwoods tend to be “oiled”. However, this has limited duration in external environments and does not prevent bleaching.

- **Opaque finish**

A moisture-permeable opaque coating is longer lasting than translucent finishes and available in a variety of colours. It is not recommended to use lacquers, varnishes, or oil paints on exterior timber as these are not vapour-permeable and may cause moisture in the timber to be trapped, causing flaking and blistering of the coating.

Detailing and Maintenance

Timber used in landscape architecture can achieve a long service life at reasonable cost, provided certain details are observed and maintenance tasks are undertaken:

- **Moisture control**

Ventilate and drain water quickly from timber components by using slopes on exposed horizontal surfaces, separating timber components from materials that absorb and hold moisture and keeping timber components at ground level clear of the 200mm-250mm splash zone.

- **Erosion**

Slipperiness of a walked-on surface is caused by the growth of biological organisms - algae, mould and slime. Keeping the timber surface free from dirt and debris prevents buildup of such organisms.

Standing water will also cause walked-on surfaces to become slippery. For example, decks should be fitted with a fall to aid drainage. Grooves in boards are designed to act as drainage channels and should be fitted in line with the fall.

- **Vandalism**

Correct jointing, robust detailing, and secure fixings can minimise damage through misuse of force. Connectors and fixings that can only be removed with special tools can be specified if highly visible. The risk of arson can be addressed to an extent through the use of dense hardwoods which are harder to ignite.