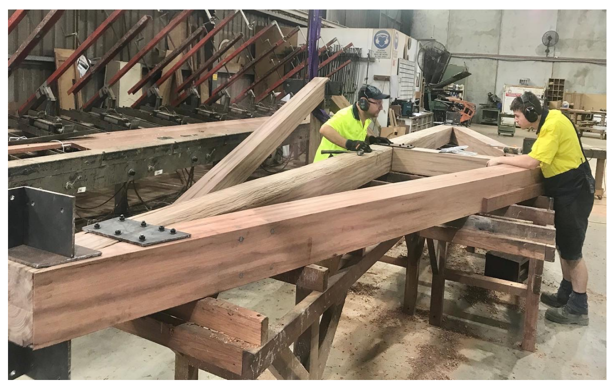
LMA TIMBER HARDWOOD - 50 YEAR DURABILITY PATHWAY FOR STRUCTURAL APPLICATIONS

Australian Hardwood such as Grey / Red Iron Bark and Spotted Gum along with other highly durable class 1 hardwoods have been used for external structural applications in New Zealand for well over a century. Whether this is for an exterior truss, pergola, jetty or wharf, the application of using Australian Hardwood has been well documented in New Zealand. Even some of the oldest wharves in New Zealand like Sumpter wharf in Otago built back in 1884 are still standing today over 140 years later.

Data sheets on the Australian Eucalyptus species that are used in external structural applications have been supplied with this document. They outline the structural properties of each of the species (generally F27 which is 5 times stronger than SG8 and twice that of GL11) including their class 1 natural durability of 40 years plus. An example of this structural certificate can be found on page 14 of this document.

Australian Hardwood - incredibly - is not in the building code as a listed species that complies with the minimum 50 year requirement. Thus, to enable a compliance pathway to meet the minimum 50 years , LMA Timber engaged Powell Fenwick - well respected structural engineers in New Zealand to create the following alternative pathway .



1. NZBC – B2/AS1: Clause 3.2(a) citing NZS 3602:2003
2. NZS 3602:2003 Clause C101.2 citing an “Authoritative Source”
3. A paper titled “Durability of New Zealand Grown Timbers” (shown on pages 3 to 8) by Tripiti Singh and David Page from NZ Journal of Forestry (being the Authoritative Source) references that NZ Durability is assessed against AS 5604:2003 .
4. Under AS 56-4:2003, probable life expectancy only assessed up to 40 years.

In addition to this, a surplus timber dimension will be considered as sacrificial layer emphasising the suitability of Class 1 Australian Hardwood. In most instances, a degradation layer of 10-20mm is sufficient. For example, if the engineer specifies a structural size of 230mm x 130mm, the hardwood will be supplied at 250 x 150mm. Should any of the timber show signs of serious degradation then a clear wood preservative such as TWA Clear Wood Preservative can be applied to the affected member areas to help prevent further degradation.

There are a number of consents where this alternative pathway has been used and accepted by various councils around New Zealand. Three of these are as follows:

CONSENT EXAMPLE 1

BCN/2019/5530/A Christchurch City Council

For this consent, they provided a maintenance programme to apply a clear wood preservative similar to the link below every 4-5 years.

https://preschem.com/products/twa-woodcare/twa-clear-wood-preservative/

CONSENT EXAMPLE 2

BCN191379 – Tauranga City Council see link for photos to this extensive project using main beams / posts in hardwood - https://www.dropbox.com/sh/6gwvtxq0swzemaq/AAA21QZ-iBpm0jI-RuI9g8Vwa?dl=0

CONSENT EXAMPLE 3

BCN 302099 – Tauranga City Council – Refer photo below. This one actually won Master Builders House of the Year a few months ago and is stunning example of the Grey Iron Bark being used structurally externally.

For any further details plus contact Martin Thompson - Managing Director at LMA Timber on 021 398 800 or email: martin@lmatimber.co.nz

Durability of New Zealand grown timbers

David Page and Tripti Singh

Data collected over many years and from field sites throughout New Zealand were used to classify the durability of timber from locally grown species. The durability classifications were based on in-ground tests of small stakes. The suitability of individual species for a range of end uses has been measured using a combination of field and 'in-service' tests around the country. These data support the use of naturally durable species as an alternative to preservative treated radiata pine. Suggested uses for the species, their suitability to meet the requirements of NZS 3602 (2003) and likely limitations are discussed.

While the in-ground durability classification provides a useful guide for above-ground uses other factors such as coatings, orientation and exposure to rainfall have a major influence on the durability of components in above-ground situations. Timber from naturally durable species exhibits more variable resistance to decay organisms than that from radiata pine treated commercially with preservatives. We found that the durability classification of some locally grown timbers may be different to that of imported timber of the same species.

There are very few species currently grown in New Zealand that will consistently meet the durability requirements for use as house piles or marine timbers. Hardwoods, particularly eucalyptus species, dominate the list of species suitable for use in moderate-high decay hazard situations such as fence posts and decking where a minimum service life of less than 50 years is required. Timber stability is important in low decay hazard uses such as weatherboards and joinery. Hence softwoods such as cypresses may be preferred for that type of use.

Durability testing

Naturally durable timber is an attractive alternative to replace or minimise the use of toxic chemical-based biocides for wood protection. Testing of the durability of locally grown timber species and their suitability for various uses in buildings has been carried out at Scion for the past 60 years and is ongoing (FRI, 1982, 1997). Originally samples for testing were taken from the general population of individual species, but more recently some selection has started in an effort to find clones with above-average durability.

Classification system

Natural durability rating refers to the timber performance both in contact with the ground and above-ground. Durability in New Zealand is measured using the Australasian natural durability classification system (AS 5604-2003), which classifies timbers into four durability classes:

- Class 1 – very durable
- Class 2 – durable
- Class 3 – moderately durable
- Class 4 – non-durable.

The benchmark testing system used is ground contact stakes, usually 50 or 20 millimetres square. All species are classified on the basis of the heartwood durability because sapwood, regardless of tree species, is non-durable. The proportion of sapwood in a tree may also influence the suitability of a species for particular end uses. For example, Robinia (*Robinia pseudoacacia*) usually has very little sapwood whereas pine species normally have a high sapwood proportion and heartwood of low to moderate durability. Robinia does not therefore require preservative treatment, but timber from pine species requires it before use in outdoor environments.

Field and in-service tests

In tests conducted by Scion, suitability for various end uses has been measured using a combination of field and in-service tests around the country. These take into account various factors as well as durability such as stability, strength, wear resistance and compatibility with coatings.

Field tests are simulated commodity tests established at Scion field test sites and may include timber from experimental or commercial production. In-service tests involve commercially produced timber components installed in buildings and other structures throughout the country. These field and in-service tests have been used to confirm the suitability of the species for above-ground end uses, as shown in Table 1.

While a particular species may perform well in these tests, other factors such as susceptibility of the growing tree to fungal and insects attack or specific site and establishment requirements could well restrict planting and subsequent utilisation. The list of species tested for durability does not include many timber species grown in this country.

There are many species in parks and small woodlots that are occasionally sawn locally or have yet to become available in commercial quantities. These include *Eucalyptus bosistoana* and some of the other species being grown under the Dryland Forests Initiative – see www. info@nzdfir.org.nz. Many of the indigenous species listed here are now seldom available. Beech species from managed forests and totara from managed woodlots in the far north may be available in small quantities.

Recycled timber from both locally grown and imported species is available sporadically, but when used in exterior situations may be less reliable than freshly cut timber.

Supplies of species other than Douglas fir and radiata pine are often localised and of variable quality. This means that heartwood of a suitable quality for uses such as joinery, weatherboards and decking is not always available. Territorial authorities may also regard these species as an 'alternative solution' under the building code and require documentation from local tests of strength and durability before they will permit their use.

Far left and above: Field test site located at Whakarewarewa, Scion, Rotorua. Far right: Service test for a locally grown western red cedar building with split shakes on the roof and gable ends

Table 1: In-ground natural durability classification for the heartwood of NZ-grown species (50 mm square stakes)

Class 1 (very durable) >25 years	Class 2 (durable) 15-25 years	Class 3 (moderately durable) 5–15 years	Class 3 (moderately durable) 5–15 years	Class 4 (non-durable) <5 years
Hardwoods	**Hardwoods**	**Hardwoods**	**Softwoods**	**Hardwoods**
Eucalyptus cladocalyx	*E. amygdalina*	Black beech[2]	Japanese cedar[2]	*Paulownia elongata*
Robinia	*E. botryoides*	Blackwood[2]	Kaikawaka[2]	*Paulownia tomentosa*
	E. cornuta	*E. globulus*[2]	Kauri[2]	Poplar
	E. globoidea	*E. sieberi*[2]	Larch[2]	Tawa
	E. muelleriana	Gleditsia[2]	Lawson cypress[2]	Silver wattle
	E. pilularis	Southern rata[2]	Lusitanica[2]	
Softwoods	*E. radiata (p)*	*E. fastigata*[1]	Macrocarpa[2]	**Softwoods**
Silver pine	*E. saligna*	*E. delegatensis*[1]	Matai[2]	*P. nigra*
Totara	European oak	*E. fraxinoides*[1]	Redwood[2]	
	Hard beech	*E. obliqua*[1]	Rimu[2]	
	Mountain beech	*E. pyrocarpa*[1]	Tanekaha[2]	
	Red beech	*E. viminalis*[1]	Western red cedar[2]	
	Sweet chestnut	*E. regnans*[1]	Douglas fir[1]	
		Hinau[1]	Leyland cypress[1] (p)	
		Mangeao[1]	Miro[1]	
		Pukatea[1]	*Pinus contorta*[1]	
		Silver beech[1]	*P. muricata*[1]	
			P. radiata[1]	
			P. strobus[1]	
			P. ponderosa[1]	

[1] Species with durability towards the lower end of the range.
[2] Species with durability towards the upper end of the range.
(p) Provisional classification, species still in test.

Variability associated with exposure conditions

Ground contact durability is influenced by climate and soil conditions – decay is faster in warmer, moist environments. Hence many of the stake durability tests have been duplicated at several sites around the country and results are combined for durability classification.

In above-ground situations there is usually less of a decay hazard than within-ground, but exposure conditions can vary widely. For example, unshaded north-facing walls are exposed to more temperature variations than south-facing walls. Also exposed decking has wide horizontal surfaces that have the potential to absorb and trap more water than the near-vertical surfaces of weatherboards.

The rule of thumb is that a species placed in Class 3 on the basis of stake test results may have an average life similar to Class 2 stakes when used away from ground contact, but this will depend very much on exposure conditions, as shown in Table 2. Coatings, particularly paint coatings, can have a major influence on durability by preventing wetting of the wood. They can have the reverse effect if not well maintained because water penetrating through breaks in a coating may remain trapped in the wood, increasing the potential for decay.

Table 2: Expected life (years) of naturally durable timbers based on 50 mm or 20 mm square testing samples

Durability Class	Ground contact stakes		Exposed above ground	
	50 mm	20 mm	50 mm	20 mm
Class 1	> 25	> 10	> 40	> 25
Class 2	15 – 25	6 – 10	20 – 40	15 – 25
Class 3	5 – 15	2 – 6	10 – 20	7 – 15
Class 4	0 – 5	0 – 2	0 – 10	0 – 7

Most Class 3 species are only suitable for use away from ground contact. Species in that durability class are loosely divided into two groups, having a durability towards the top or the bottom of the range. Species towards the top of the range are generally suitable for non-structural exterior uses, but those towards the bottom are only suitable for exterior use where they receive some protection from the weather and are in low decay hazard situations.

Table 3: In-ground stake durability variation for three Class 2 eucalyptus species

Species	Tree 1	Tree 2	Tree 3	Tree 4	Tree 5	Average
E. pilularis	13.3 (5 – 21)	6.6 (3 – 13)	10.9 (3 – 17)	5.7 (1 – 12)	10.4 (5 – 12)	**9.9**
E. muelleriana	10.7 (6 – 20)	6.2 (2 – 16)	6.6 (2 – 15)	8.2 (3 – 13)	9.4 (4 – 18)	**9.2**
E. globoidea	12.4 (6 – 20)	14.3 (5 – 24)	12.0 (3 – 32)	9.4 (3 – 18)	14.3 (5 – 21)	**9.8**

Variability within species

Durability is variable from tree-to-tree of the same species and may be influenced by genetics, growing conditions, climate and wood age, among other factors. An illustration of the type of variation that can be expected within and between species in the same durability class is given in Table 3.

The average life in years for 20 millimetre square heartwood stakes from each tree is shown, with the overall average for the species in this test in the last column. Note that the number of stakes from each tree varied. Figures in parenthesis show the range of durability (in years) for stakes from each tree. For a species to be classified as of Class 2 durability the average life of 20 millimetre square stakes would need to be six to 10 years. The stakes used in this test were all heartwood and were installed in the same plot at the same time. Hence exposure conditions were similar for all groups.

The average life for each species was at the upper end of the range for Class 2 durability, but *E. pilularis* tree 4 was only of Class 3 durability. E pilularis tree 2 and *E. muelleriana* trees 2 and 3 were at the lower end of the Class 2 durability range, whereas three of the *E. pilularis*, one of the *E. muelleriana* and four of the *E. globoidea* trees were of Class 1 durability.

The figures in parenthesis probably best illustrate the variation in durability with some stakes failing after only one or two years. At the other end of the scale, at least one stake from each tree lasted 12 years or more and one *E. globoidea* stake survived for 32 years.

Suitability for various end uses

Regulations require that timber used in building structural situations should have a minimum life of 50 years. Timber used in non-structural situations should have a minimum life of 15 years if used externally and five years if used internally.

Ground contact posts, piles and poles

Very few species, including those in the Class 1 durability range, would consistently have a minimum life of 50 years when used in ground contact situations in New Zealand unless they are of large cross-sectional dimensions (more than 200 millimetres). The Australian Timber Service Life Design Guide indicates that 200 millimetre diameter Class 1 durability poles would have an expected life of 30 to 45 years in south-eastern Australia, an area where the climatic conditions are similar to those in New Zealand. Hence naturally durable species are now seldom used for house piles or poles unless they are supported on steel brackets away from ground contact.

Fence posts have no regulatory minimum life requirement, but 75 to 100 millimetre thick heartwood posts would be expected to last at least 15 years with an average life of 25 to 30 years. Generally Class 1 and Class 2 species will meet this requirement, although occasional failures of Class 2 species inside 15 years are likely.

Split or round posts from young trees are likely to be less reliable than split or sawn posts from mature trees, and in all cases sapwood on posts is likely to rot away within five to 10 years. Species towards the top of the Class 3 range, such as macrocarpa, are often used in ground contact situations. The average life of these is likely to be 15 to 20 years, with early failures occurring in five to 10 years.

Decking and above-ground fence components

These end uses often include moderate-severe decay hazards where timber components are in close contact and in frequently damp situations. The minimum durability requirement for decking is 15 years, but there is no minimum requirement for fence materials. Class 2 species are generally satisfactory for this, although some decay is likely within that time. Thickness may be important because thin (19 millimetre finished thickness) decking of Class 2 species may have an average life of less than 15 years in wetter shaded areas where there is a higher decay hazard.

Class 2 species should be suitable for fence rails and battens, although some decay is likely to develop at rail/post and rail/batten joins in 10 to 15 years. Upper range Class 3 species, such as macrocarpa, may be satisfactory as decking in partly protected situations. However occasional failures of individual boards are likely in 10 to 15 years in more exposed situations. Lower range Class 3 species used in these situations, such as Douglas fir, are often unreliable and likely to fail in the five to 15-year timeframe.

Framing for decking is required to have a 50-year minimum life. In situations where it is partly protected from the weather, framing of Class 2 durability may meet this requirement but earlier failures could be expected where the framing is fully exposed to the weather. Class 1 durable species are more reliable in these situations and in other external structures, such as pergolas, if 50-year durability is a minimum requirement.

Weatherboards and exterior finishing timbers

These are usually exposed to relatively low decay hazards and are often partly protected by paint or other building elements such as eaves. Stability and appearance are often more important to the eventual service life of these timbers than the durability of the wood. Note that:

- Species in the upper durability range within Class 3 such as the cypresses, western red cedar and redwood are traditional timbers for this type of end use and are relatively stable. Hence heartwood can be used uncoated or stain-coated where a more rustic or 'natural' appearance is desired
- Species in the lower end of the Class 3 range, such as Douglas fir and larch, are less reliable in damp areas and require protection such as paint. Boards containing sapwood should not be used externally unless completely protected from the weather.

External windows and doors

These are usually exposed to low or moderate decay hazards and are commonly protected by paint coatings. Stability and durability are equally important. Hence species such as imported western red cedar and redwood have often been used for this purpose. Species in the upper section of Class 3, western red cedar, redwood and the cypresses are all suitable for this purpose where timber of a suitable grade is available.

Specialty uses

- **Marine piles** – timber immersed in saltwater is subject to damage from a variety of marine boring organisms and no locally grown species have shown prolonged resistance to them (Carr, 1953). There are reports of totara and silver pine having a life of more than 10 years in areas where marine borers are less active. Specially preservative treated (Treatment hazard class H6) and a few naturally resistant imported species, for example turpentine (*Syncarpia glomufolia*) from Australia and greenheart (*Ocotea rodiaei)* from tropical America, are the only suitable species for this use.
- **Freshwater timbers** – timber immersed in freshwater usually reaches a moisture content above that at which most decay fungi will attack it. For this reason, sunken logs of non-durable species have remained sound for many years in lakes and rivers. The heartwood of Class 1 and 2 durable species is adequate for most freshwater situations. The section out of the water remains vulnerable to damage by decay fungi. Structural components therefore probably require Class 1 durability if a 50-year life is required and non-structural components Class 2 durability to meet a 15-year minimum requirement.
- **Roof shingles and shakes** – the local traditional species for wooden roof shingles and shakes were totara, kaikawaka and kauri (they were largely replaced by imported western red cedar and Alaskan yellow cedar shingles). Locally grown western red cedar and some of the more durable eucalyptus species, for example *E. saligna*, have been tested as shingles but are less durable and not as stable as the imported species. Quarter-sawn heartwood of locally grown cypresses gave slightly better results, and would probably meet the minimum durability requirement of 15 years on steeper pitched roofs when combined with a well-designed installation system.

Conclusion

Classification and predication of in-service performances of naturally durable timber is much more difficult than preservative treated timber due to the variability of wood properties within and between trees of the same species and the variable nature of the hazard to which the timber will be exposed. A combination of field test and in-service testing has been used to classify the suitability of locally grown timber for various end-uses and to show that they are a suitable substitute for preservative treated timber.

Acknowledgements

This is an update of earlier *What's New in Forest Research* FRI Bulletins 112 (1982) and 245 (1997). It is based on data collected by Jackie van-der Waals, Ian Simpson and many earlier members of the Scion Wood Preservation Group.

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Modelling wood processing options for New Zealand: Economic impact analysis

Luke Barry and Peter Hall

Abstract

A national-level financial model was used in the WoodScape study to analyse the potential of a range of traditional and emerging wood processing technologies. The model inputs industry sourced techno-economic data on wood processing options and macroeconomic impacts from across New Zealand and, where necessary, the rest of the world to assess the increase in GDP, employment and export earnings from processing wood harvested in this country. This identified a number of traditional and emerging technologies, which offer potentially significant increases for both the individual firm and the wider economy. The WoodScape modelling shows that GDP could increase by almost NZ$1.1 billion per annum, almost 4,500 extra jobs could be created, and export earnings could rise by an estimated NZ$2 billion. This was estimated by applying a conservative average increase in GDP, employment and export earnings across WoodScape technologies from onshore processing of an extra 11 million cubic metres of typically exported logs. Increased wood processing has an important role in New Zealand's economic growth. The WoodScape study found that most wood processing options can make a significant contribution to GDP. A number of the options also look attractive for investment based on their return on capital (>20 per cent), cash flow and the market opportunity for their products. Several wood processing options show a labour productivity greater than $200 per hour of employment, comparable to the highest performing sectors of the economy.

Background

The economic impacts reported here were developed from the WoodScape study. WoodScape (2012) looked at a wide range of wood processing options to determine those that would be likely to perform well in New Zealand based on the operating conditions at the time of the study (2012). An important measure of performance was return on capital employed (ROCE). A summary of the ROCE results from the model used in the study is presented in Figure 1.

This data shows a range of technologies that have ROCE results above 10 per cent. There is a trend for larger-scale operations to perform better than the same technology at a smaller scale. There are a number of engineered wood product, and fuel and chemical, options that look promising although some are not developed to full commercial operations yet.

The ROCE results are highly sensitive to foreign exchange fluctuations as well as product and feedstock price changes. The primary resource considered was the logs which are currently being exported (A and K grade). Additional processing capacity is assumed to be targeted at the export market as the domestic market is largely saturated and cannot absorb the volume of product that could be generated by the development of processing on a scale that could take a substantial proportion of the 2012 export log volume (~13.0 million cubic metres per annum). The export log volume has risen since the original study/report was published and is now ~16 million cubic metres per annum.

The log export market is a crucial outlet for domestic log supply surplus, but the wood processing sector also has the potential to add significant value to each log harvested. More onshore processing, starting with the initial increases in production and employment from this, will have a multiplicative effect throughout the economy. The purpose of this paper is to quantify and discuss the macroeconomic contribution resulting from increased wood processing across a range of wood processing options.

The scale of the opportunity is significant as New Zealand exported around 50 per cent (~13 million cubic metres per annum) of its ~26.5 million cubic metres per annum log harvest in 2012. Increased onshore processing of this log supply is an important part of the Woodco Strategic Action Plan (SAP). The plan states its goal is to increase export earnings from forestry and wood processing to $12 billion per annum by 2022, up from its current $5 billion. These figures for gross export earnings should not be confused with GDP figures, this being a lower figure as it is based on the value added by profitable processing and not the gross income from any processing.

Macroeconomic multipliers

A macroeconomic impact or effect refers to changes in economic activity in relation to a change in gross output. A macroeconomic multiplier is the ratio of the sum of impacts, for example direct plus indirect, to the direct impact. The effects of an increase in wood processing production in New Zealand are multiple and are generally broken down into three categories:

- **Direct** – additional domestic manufacturing, perhaps as a result of a sustained increase in offshore demand, requires manufacturers to purchase more

GREY IRONBARK

GREY IRONBARK

GREY IRONBARK IS THE PINNACLE OF VERSATILE AUSTRALIAN HARDWOODS.

This versatility has seen it expand into a new, limitless range of applications including cladding, flooring, decking and joinery products as well as feature posts and beams.

With a deep patina, the colour palette of the Grey Ironbark varies from a mahogany like appearance to pale and dark shades of brown and rich reds.

Suitable for high exposure applications due to its exceptional durability and incredible strength. Grey Ironbark is the top choice for exterior exposed applications.

Today Grey Ironbark is also recognised for its rich, warm colouring and stunning patina, revealing its adaptability and suitability as an internal building material.

COMMON NAME	Grey Ironbark
LOOK & FEATURES	Moderately coarse & even texture, heavy, hard & compact
BOTANICAL NAME	Eucalyptus paniculata Eucalyptus siderophloia
COLOUR	Pale through to dark brown with occasional darker reds
COMMON USES	Cladding, flooring and decking, joinery, feature posts and beams, framework

PROPERTIES

DENSITY (KG/M3)	
GD	1250
ADD	1100
HARDNESS KN (JANKA)	
Green	11
Dry	16.3
DURABILITY CLASS	1
STRENGTH GROUP	S1/SD1
JOINT GROUP	J1/JD1
SHRINKAGE	
Radial % (approx.)	4.5
Tangential % (approx)	7.5
STRUCTURAL GRADES	
Unseasoned	F14/F17/F22
Seasoned	F27/F34+
TOUGHNESS (NM)	
Green	High
Dry	High
EARLY FIRE HAZARD INDICES	
Ignitability	13
Spread of Flame	3
Smoke Development	3
TERMITE RESISTANT	(toAS3660) Yes
LYCTID SUSCEPTIBLE SAPWOOD	No

SPOTTED GUM

SPOTTED GUM

IS AN EXTREMELY ADAPTABLE AND NATURALLY STRONG TIMBER WHICH MAKES IT IDEALLY SUITED TO NUMEROUS APPLICATIONS.

Once predominantly used only as a structural timber, considering its natural beauty and sheer strength, its not surprising Spotted Gum has found favour in many aesthetic, and architectural applications with extremely impressive results.

Due to its significant versatility and durability you will find Spotted Gum used in a wide variety of applications. From building and construction, including structural components, flooring, cladding, and decking through to furniture (indoor and outdoor), landscaping, poles, beams, the list goes on.

Widely used for power poles, bridge timbers and general construction, Spotted Gum is one of the most widely available Kennedy's in Australia today.

COMMON NAME	Spotted Gum
LOOK & FEATURES	Backsawn grain, Fiddleback, Distinctive sapwood, gum veins
BOTANICAL NAME	Corymbia maculata
COLOUR	Light coffee brown to dark chocolate with some reddish tinges
COMMON USES	Building and construction, structural timbers, flooring, cladding, decking, furniture, landscaping, posts and beams

PROPERTIES

DENSITY (KG/M3)	
GD	1200
ADD	1100
HARDNESS KN (JANKA)	
Green	8.0
Dry	10.1
DURABILITY CLASS	1
STRENGTH GROUP	S1/SD1
JOINT GROUP	J1/JD1
SHRINKAGE	
Radial % (approx.)	4.5
Tangential % (approx)	6.0
STRUCTURAL GRADES	
Unseasoned	F11/F14/F17
Seasoned	F22/F27
TOUGHNESS (NM)	
Green	High
Dry	High
EARLY FIRE HAZARD INDICES	
Ignitability	13
Spread of Flame	3
Smoke Development	3
TERMITE RESISTANT	(toAS3660) Yes
LYCTID SUSCEPTIBLE SAPWOOD	Yes

BLACKBUTT

BLACKBUTT

BLACKBUTT IS THE IDEAL TIMBER FOR A WIDE VARIETY OF CLADDING, FLOORING AND DECKING APPLICATIONS.

A popular choice for architects, builders and designers, Blackbutt is admired for its incredible durability and fire resistant properties. Perfect for large fit outs (e.g. shopping centres and high rise buildings) Blackbutt is a readily available and versatile timber.

A beautiful hardwood, Blackbutt presents a relatively straight and uniform grain with an appealing colour palette, ranging from cream to pale brown with a hint of pink.

With a reputation for excellence, Class One Durability Blackbutt is in high demand within the commercial building industry. Our recycled Blackbutt is graded according to the Interim Industry Standards whilst our new certified Blackbutt is AFS approved (Australian Forestry Standard).

COMMON NAME Blackbutt

LOOK & FEATURES A particularly strong and durable timber that can display gum and veins giving it a unique look.

BOTANICAL NAME Eucalyptus pilularis

COLOUR A subtle colour range where light and neutral is required from golden yellow through to pale browns. May have a slightly pinkish tinge.

COMMON USES An extremely versatile timber with uses ranging from posts and beams through to decking, flooring and furniture.

PROPERTIES

DENSITY (KG/M3)	
GD	1150
ADD	900
HARDNESS KN (JANKA)	
Green	6.4
Dry	8.9
DURABILITY CLASS	1
STRENGTH GROUP	S2/SD2
JOINT GROUP	J2/JD2
SHRINKAGE	
Radial % (approx.)	4
Tangential % (approx)	7
STRUCTURAL GRADES	
Unseasoned	F14/F17/F22
Seasoned	F22/F27
TOUGHNESS (NM)	
Green	Medium
Dry	Medium
EARLY FIRE HAZARD INDICES	
Ignitability	13
Spread of Flame	7
Smoke Development	3
TERMITE RESISTANT	(toAS3660) Yes
LYCTID SUSCEPTIBLE SAPWOOD	No

TALLOWWOOD

TALLOWWOOD

HAS A WIDE VARIETY OF USES HOWEVER PARTICULARLY IMPRESSIVE RESULTS ARE ACHIEVED WHEN FEATURED AS INTERNAL FLOORING/ CLADDING AND/OR EXTERNAL FEATURE TIMBERS.

Other applications include decking, linings, exposed structures, poles, bridge timbers, joinery and outdoor furniture. Tallowwood heartwood is pale to yellowish-brown.

This wood has a fairly coarse texture with an interlocking grain. As the word 'tallow' suggests, the timber of this species feels greasy to the touch. Tallowwood is reasonably easy to work however gluing can be difficult due to the greasy nature of the timber. Tallowwood accepts paint, stain and polish readily and fixing with standard fixings and fasteners presents no problems.

Generally, Tallowwood is an extremely tough and durable Australian timber used widely in external applications such as decking.

COMMON NAME	Tallowwood
LOOK & FEATURES	Fairly close-grained timber, free of gum vein
BOTANICAL NAME	Eucalyptus microcorys
COLOUR	Pale to yellowish-brown
COMMON USES	Decking, flooring, cladding, domestic structures, heavy commercial construction, posts, joinery and outdoor furniture

PROPERTIES

DENSITY (KG/M3)	
GD	1200
ADD	1000
HARDNESS KN (JANKA)	
Green	7.6
Dry	8.6
DURABILITY CLASS	1
STRENGTH GROUP	S2/SD2
JOINT GROUP	J1/JD2
SHRINKAGE	
Radial % (approx.)	4.0
Tangential % (approx)	6.0
STRUCTURAL GRADES	
Unseasoned	F11/F14/F17
Seasoned	F22/F27
TOUGHNESS (NM)	
Green	Medium
Dry	Medium
EARLY FIRE HAZARD INDICES	
Ignitability	12
Spread of Flame	5
Smoke Development	4
TERMITE RESISTANT	(to AS3660) Yes
LYCTID SUSCEPTIBLE SAPWOOD	Yes

RED IRONBARK

RED IRONBARK

THE STRENGTH AND DURABILITY OF THIS AUSTRALIAN HARDWOOD HAS SEEN IT USED THROUGHOUT THE AGES AS A PREFERRED STRUCTURAL TIMBER.

Red Ironbark is a very strong Australian hardwood that originated from QLD and NSW. Today Red Ironbark is used for all manner of building construction materials from poles to posts and beams and is ideal for hardwearing areas such as flooring and decking. Whilst being quite hard to work with due to its density and hardness it also polishes to a high sheen and as such is frequently used for furniture, benchtops, bars and even in boat-building.

The heartwood is a deep rich dark red to red-brown in colour. The sapwood by contrast is a pale yellow. The timber's texture is fine with an interlocked grain.

COMMON NAME Red Ironbark

LOOK & FEATURES Highly durable with a medium and even texture

BOTANICAL NAME Eucalyptus sideroxylon, Eucalyptus creba fibrosa

COLOUR The heartwood colour is deep red. Sapwood is very distinctive, being pale yellow in colour

COMMON USES A wide range of external applications including heavy engineering, marine structures, poles, sleepers, framework, flooring and decking

PROPERTIES

DENSITY (KG/M3)	
GD	1200
ADD	1100
HARDNESS KN (JANKA)	
Green	N/A
Dry	11.9
DURABILITY CLASS	1
STRENGTH GROUP	S2/SD3
JOINT GROUP	J1/JD1
SHRINKAGE	
Radial % (approx.)	3.5
Tangential % (approx)	7
STRUCTURAL GRADES	
Unseasoned	F11/F14/F17
Seasoned	F22/F27
TOUGHNESS (NM)	
Green	High
Dry	Medium/High
EARLY FIRE HAZARD INDICES	
Ignitability	Not available
Spread of Flame	Not available
Smoke Development	Not available
TERMITE RESISTANT	(toAS3660) Yes
LYCTID SUSCEPTIBLE SAPWOOD	Yes

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KENNEDY'S
reclaimed & sustainable
architectural timbers

11 September 2023

Structural Supplier Certificate Statement

This statement confirms the following timber is structural to Australian Standards AS 2082

Vessel Name:	NYK Futago
Voyage Number:	089N
Container Number or Numbers:	MRKU3064126
LMA Order Number	SOUTHERN LAKES ITM
Kennedy's Invoice Number	06230043

This statement confirms Kennedys Timbers supplied the following structural timbers to LMA Timbers.

1. 300mm x 300mm (Nominal) GIBK - Seasoned - HB - F27 Structual
   SET LENGTHS 4/10.2, 1/9.3

2. 300mm x 300mm (Nominal) GIBK - Seasoned - HB - F27 Structual
   SET LENGTHS 6/7.2, 2/6.3

3. 300mm x 300mm (Nominal) GIBK - Seasoned - HB - F27 Structual
   SET LENGTHS 2/1.4, 1/0.9

4. 350mm x 200mm (Nominal) GIBK - Seasoned - HB - F27 Structual
   SET LENGTHS 8/4.5

5. 200mm x 75mm (Nominal) GIBK - Seasoned - HB - F27 Structual
   SET LENGTHS 48/3.6, 16/2.7, 16/1.8, 16/0.9

3
This timber is certified as being structurally graded to F27 and meets both the relevant Australian Standards and the Qld – TUMA – 1994 (Timber Utilization and Marketing ACT).

Michael Kennedy
Founder and CEO

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