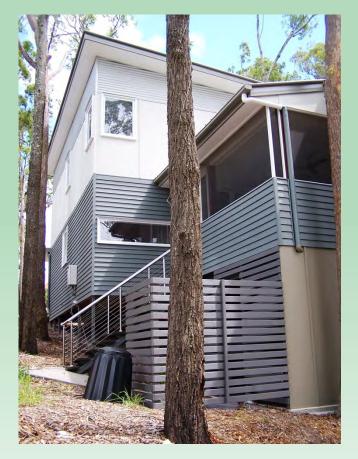


- Getting the best from local resources -

Colin MacKenzie
Timber Queensland







"Treetops" at Taragindi

Cairns boardwalk





Unit at Kangaroo Point



Content

- Key properties
- Information sources
- Some species attributes vs application
- Some points to consider
 - > Cladding
 - Decking
 - > Flooring



Some key properties

Property	Cladding	Decking	Flooring
Strength	-	+	+
Density (Hardness)	-	+	+
Durability	+	+	-
Stability	+	+	+
- Moisture content	, Shrinkage and UTN	Л	
Termite resistance	+	+	+
Bushfire resistance	+	+	-

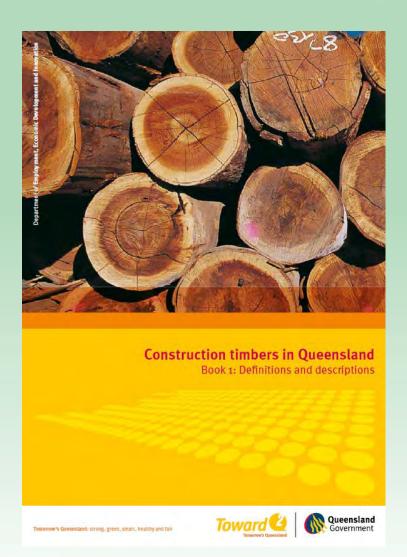


Timbers and their properties

8	9	10	11	12	13	14									15
	-	ss mt)	ity						Co	mmon	Uses			4	
Tangential Shrinkage %	% Unit Tangential Movement	#Durability Class (*Termite Resistant)	Lyctid Susceptibility	Bushfire Rated	Colour	In Ground	Framing Above Ground-Exposed	Framing Above Ground-Protected	Decking	Cladding	Internal	Panelling	External Joinery	Internal Joinery	Availability varies region by region
8.5	0.35	4/3	S	9	W	-	-	S	2	-	0	0	×	0	R
4.2	.511	1/1	S	6	W		-	1	0	14	0	-	-	÷	L
13.3	0.36	4/3	NS	-	W	-	-	- 3	-		0	0	-	0	R
10.6	0.36	3/2	NS	~	W-P	-	- 1	0	â.	2			-	-	L
7.0	4	2/1	S	V*	R	-	0	0	0	0	0	0			R
5.0	34	2/2	S	-	w	P	0		0	-	0	0	-	-	L
4.5	-	1/1	NS	2)	В	-	1		0	-			*	*	L
4.7	0.32	4/3	NS	-	P	-	-	0	-	0	0	0	-	0	L
4.0	4	1*/1	S	2-	R	0	-	12	-	-	4	2	-	-	L
7.3	0.37	2*/1	NS	~	W	-	0	0	0	0	0	0	-	-	R



No Excuses!



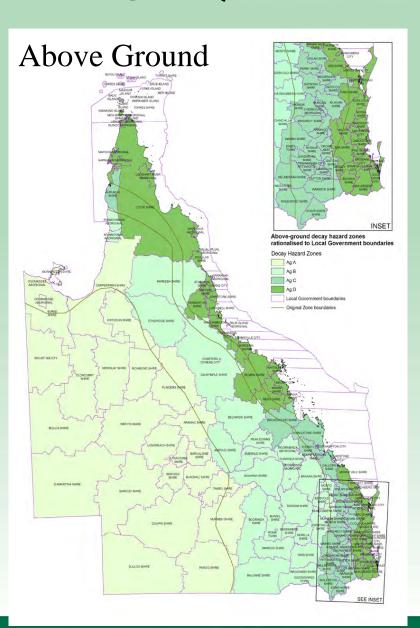


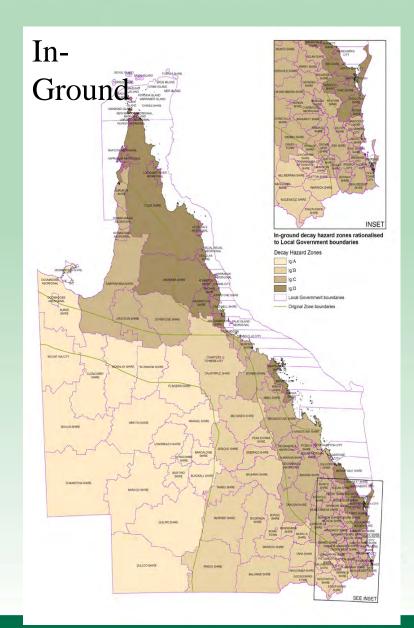
Book 1 – Target Design Life

Building member	Environment	Target design life (yrs)	Application (Column no. in Schedules A, B and C)
architraves	protected	15	12
balusters	exposed	50	16
Dalusters	protected	50	15
barge boards	exposed	15	13
	between stumps	5	11
	under lining or cladding	50	15
battens	external wall	15	13
balleris	greenhouse	15	13
	pergola	15	13
	roof, ceiling	50	15
haama	exposed	50	16
beams	protected	50	15
hoororo	exposed	50	16
bearers	protected	50	15



CTIQ - Book 1 - Hazard Zones





CTIQ - Layout - Book 2

1 (p.9)				Timber s				_	_			_				Timb		_				_
	2 (page 9.)					3 (page	9)					4	5 (p.10)	6			7 (14)		8 (p.14	0	9 (p.16)	10 (p.17
(0.0)	(page 9)					(page	9)				φ.	10)	kg/m²) (cm/gx/	Stren grou (page	igth ips	Joint	t groups ge 14)	dura	(p.14 Natur ability r ipage	al ratings	(p.16)	(p.1/
Index number	Standard trade name			Ī	Pr	0	pe	r	tic	e	S			(ui	-	£		bearing and the	ninoile	pı.	Lyctine susceptibility	e resistance
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331	penda, southern	X	anthosiamon		is.						Qs		1120	(2)	(2)	_	1		1	2	NS	NR
332	pends, yellow	R	listantia pachj								Qn		815	(4)	(4)	-	2	(2	,	3	NS	NR
333	peppermint, New England	Б	ucalyptus noi								Qs, A		800	4	4	_	2	6	3)	3	S	NR R
334	peppermint, Queensland	b	ucalyptus exs	laubatii							Oncs	_	1010	(2)	(3)	_	1	-	1	1		NR.
336	perperwood persimmon, grey	0	inspiros peri								Qinc Qincs,	Δ	480 735	(7) 5	(8)		3		4)	4	S	NB
337	persittiidit, grey pimplebark		idapyros peri islandos austr								Onc.	-	965	(4)	3	-	2		4)	4	(S)	NR
338	pine. Benguel	ρ	inus kesiva								Once		495	(7)	(8)		4		4)	4	NS	NR
339	pine, black	P	rumnopitys a	mara						_	Qn	-	495	6	7		4		1)	4	NS	NR
340	pine, brown	Р	odocarpus or	ravi							Qnc	-	550	(7)	(7)	_	4		4)	4	NS	NB
		Р	rumnopitys la	adei							Qn	-	705	(5)	(6)		3		4)	4	NS	NR
		Р	odocarpus el	latus .							Oncs,	A	560	(6)	(7)	_	4		4)	4	NS	NR
341	pine, bunya	A	raucaria bidw	PÅÝ.							Qns	\neg	530	6	5	4	4	-	1	4	NS	NR
342	pine, Caribbean	Р	inus canbaea								Oncs,	. А	545	(6)	(6)	4	4	4	4	4	NS	R
		P	inus caribaea	THE RESERVE	remain.						Qnos		545	(6)	(6)	4	4	ĺ	4)	4	NS	R
		Р	inus caribaea	a var. hondu	rensis						Qncs		575	(6)	(6)	4	4	- (4	4)	4	NS	R
	pine, cypress	58	ee cypress																			
343	pine, hoop	A	raucaria cum	ninghamii							Qncs,		560	6	5	4	4	- 4		4	NS	NR
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			_	_			Fold	-out	gui			RT 1 of the Sched	ules					
 an high dash 	slight indic				estimbi	o date	availat	in or to	ma of			light indicates softwood						
- 0031				NES IN	residue	c oeus	ava au	NE BL U	IIIE OL	pouce	BUUNT							
			- 1	Colun	nn 4-	Origin	5											
Code	Geogra					Code		подгар		ource			Column 2	-Joint groups				
A	Non - C			dates:		NA.	N	orth An	nerica			There are six joint group	s for unseas	oned timber rand	and downwards from 10			
N	New So					E		rope				(strongest) to 36			- Committee of the comm			
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Žiti .	Norther			K)		AP	As	63 / Pa	ofic ar	1275	/							
S	South A																	
T V	Tasman Victoria											Column 8-	Interpretin	g natural dura	bility ratings			
W	Western		elia	_								Durability class	Above	ground life	In-ground life			
	-													ectancy	expectancy			
		Col	lumo	5-D	ensity	and u	tilisat	ion				1	> 4	i0 years	> 25 years			
	range	Hard					ive to i					2	15 to	40 years	15 to 25 years			
190 kg	/m³	Very	soft:				ince to	inden	tation -	- cove	red	3	7 to	15 years	5 to 15 years			
_					oring o							4	Less ti	an 7 years	Less than 5 years:			
5 - 56	i0 kg/m ²	Soft					to inde		- ligh	t train)	C							
5 - 90	io kg/m³	Firm	_				estic fi		_	_	_							
	O kg/m²	Hard	_				noe to		ation a	nd we	ar:	Column 9-	Interpretio	g lyctine susce	orthillity codes			
- 7		1		SU	table fi	or feat	ure floo	ors, ste	p treat	fs.	-	Code used in sch			optibility status			
					nchtop							NS.			tible to lyttine attack			
65 kg	/m²	Very	hard				e speci		difficul	t to w	ork	(i)			n legal terms) lyctine			
				an	d requi	re shar	p took					(3)		susceptible	in regal terms) sycurie			
		_	F-100		-	gth g						5		Committee of the last	tine susceptible			
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asone	d strenath	1	SDI	SDZ	203	504	SD5	SD6	SD7	SD8		Column 10	Interpret	ing termite res	istance codes			
ual gr	rados					Street	ss grad	ter		_	-	Code used in sch		Termite resis				
to the second			E74	E24	E22		E17		Ctt	1 60	1 67	0		Markly resistant				

Fold-out guides for	PART 2 of the Schedules
Blue highlight indicates hardwood	Yellow highlight indicates softwood
 Approved Subject to conditions of use and treatment requirements specified. 	ed in Part 1 X Not approved

	Columns 12 to 1	7—Cond	litions of use codes
Code	Condition	Code	Condition
C1	Desapped for in-ground contact if untreated	C11	Pole frame construction poles must be set in stirrups
CZ	Minimum dimension – 100 x 100 mm	C12	Single species only, free of heart
C3	Minimum dimension – 150 x 150 mm	C13	Desapped where in-ground-min- diameter 200 mm
C4	Minimum dimension – 200 x 200 mm	C14	Desapped where in-ground-min diameter 300 mm
CS	Round timber only- treatment H4 min	C15	Desapped where in-ground-min diameter 400 mm
C6	Round timber > 200 mm diameter = H4 min	C16	Seasoned
C7	Round timber > 200 mm diameter = HS min	C17	weather exposed door jambs & mullions must comply with industry
C8	Round timber > 100 mm diameter = 115 min		recommendations
C9	Round timber > 400 mm diameter - HS min	Н3	Minimum H3 level of preservative: treatment
C10	Part sessoned – max MC 20%	114	Minimum H4 level of preservative treatment
		HS	Minimum HS level of preservative treatment

Ab	ove-ground decay hazard zones	In-ground decay hazard zones					
Ag:A	Least potential for above- ground decay	Iq:A	Least potential for in-ground decay				
Ag:B	Lower than Ag-C - greater than Ag-A	Ig:B	Lower than Ig:C - greater than Ig:A				
Aq:C	Lower than Ag:D - greater than Ag:B	Ig:C	Lower than lg:D - greater than lg:B				
Ag:D	greatest potential for above- ground decay	Ig:D	greatest potential for in-ground deca				

	Column 18-	Advisory	Codes
Advisory	codes provide general information	relevant to	particular species
Çode	Condition	Code	Condition
AI	High shrinkage	A6	Included bank sometimes present
A2	Density, hardness & strength vary with origin and species	A7	Finishes sometimes affected by resin bleed
A3	Gum veins common	A8	Latex canals common
A4	Paint / protect against Queensland pine beesle	A9.	Corrodes ferrous fastenings when will
A5	Usually knotty		

	Columns 11 to 17—Applications
Column	
- 11	5 year target design life applications
12	15 year target design life applications: protected, non-structural huilding applications
13	15 year target design life applications: weather-exposed, structural and/or non-structural building applications
14	15 year target design life applications: in ground, accessible, structural building applications
15	50 year target design life applications: protected, structural and/or non- structural building applications
16	50 year target design life applications: weather-exposed, structural and/or non-structural building applications
17	50 year target design life applications: in-ground, structural building applications



Properties of various timbers

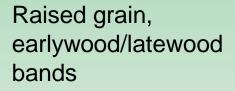
Property	HWD (spotted gum, ironbark)	HWD (Other)	Cypress	Softwood (Hoop, Slash etc)
Strength	S2	S2 to S5	S5	S5/S6
Density (Hardness)	900 kg/m3 + High	600 kg/m3 +	700 kg/m3	500 to 650 kg/m3
Natural Durability	AG Class 1	AG Class 1 to Class 4	AG Class 1	AG Class 4
Stability (shrinkage, UTM)	6.2% 0.38	Low to V High	2.5% 0.26	4.0 to 5.0% 0.23 to 0.3
Termite resistant	Yes	Some (eg BBT/Kwila)	Yes	No/yes
Bushfire resistant	Yes	Some (eg BBT/Kwila)	No	No

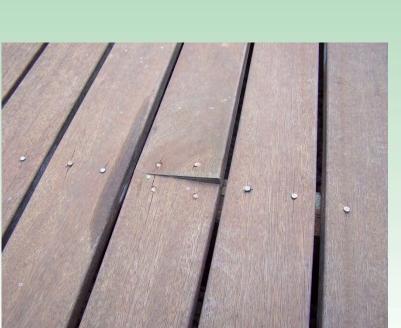
Also need to consider:

- Resistance to weathering (horizontal vs vertical)
 - Dense hwd's generally good, swd not as good
- Stability MC, straight grained
- Shrinkage swd < hwd
- Fixings hwd vs swd, splitting/pre-drilling, corrosion resistance









Dense hwd weathers well but more challenging to restrain



Correct fixings critical

















Points to consider

Cladding

- Allow for movement rebates, overlaps
- Dark paint = more shrinkage/checks
- Colour match undercoat
- Wider = greater shrinkage/expansion
- Use vapour permeable sarking
- Appropriate & galvanised nails etc
- Knot sealer may be required

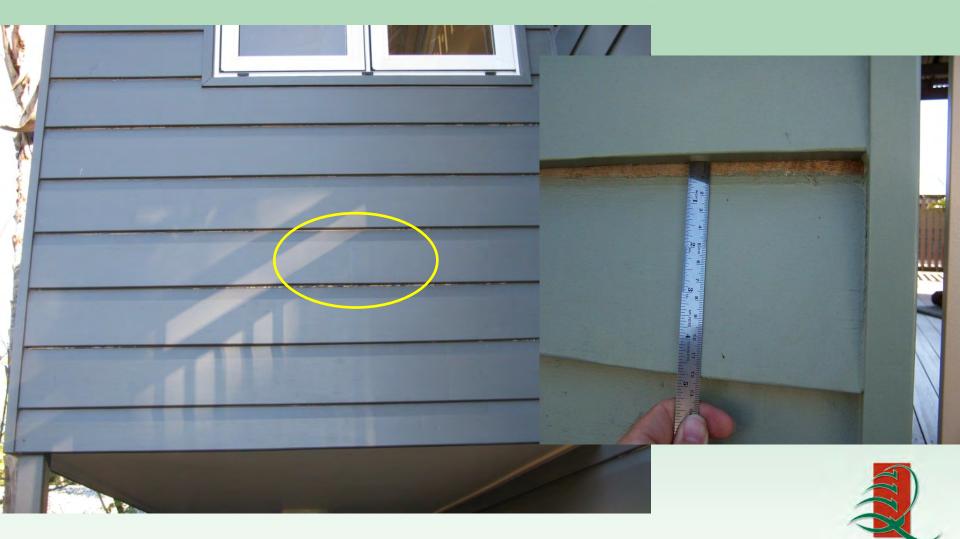


Cladding





Allow for movement







Use the correct nails







Knot sealer may be required (Cypress, hoop, radiata etc)

e.g. two pack polyurethane



For 'natural' finish, apply WRP's





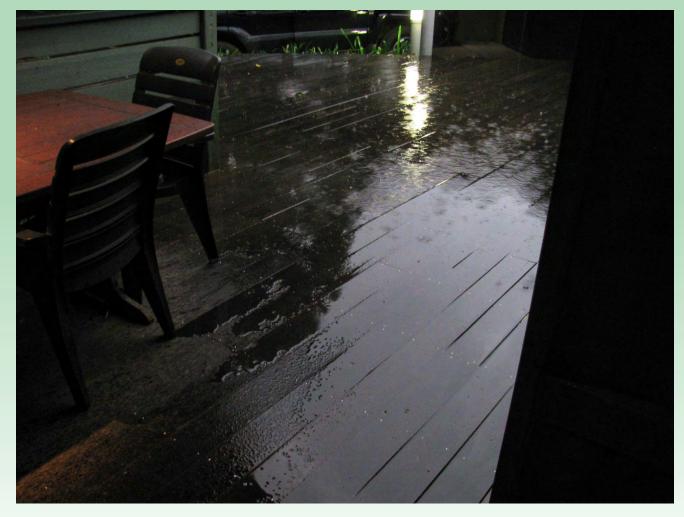
e.g. Zinc Napthenate



Points to consider Decking

- Allow for movement shrinkage/expansion
- Wider = more shrinkage/expansion/cupping
- Galvanised/stainless nails or screws
- Close to ground/slab high moisture under
 - ✓ Narrow boards
 - ✓ Wider gaps
 - ✓ Ventilation under
 - ✓ Rapid draining
- Minimise unsightly stains (iron, pollen etc)
- Maintenance critical for performance

Allow for expansion and shrinkage





Decks close to/on ground/slab



Increase gaps, provide edge ventilation, rapid drainage and use narrow boards



Correct moisture content can be critical





Minimise splitting

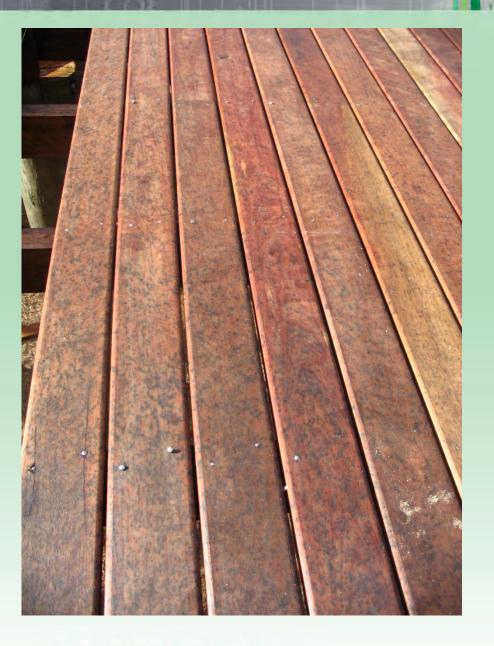




Joist strips







Stains caused by pollutants

e.g. pollen, iron filings, jet fuel fallout etc
Apply a finish all round before laying



Reeded side up or reeded side down?







Maintain for maximum life





Commercial decking





Commercial decking

Table 4 Allowable Decking Board Spans

Point Loads	Size (mm x mm)		Allowable Decking Board Spans								
Point Load 2.7 kN (Light Pedestrian Traffic)	35 x 70 35 x 90 35 x 120 35 x 140 45 x 70 45 x 90 45 x 120 45 x 140	F7 580 660 720 760 780 840 940 980	MGP12 700 780 860 900 920 1000 1100 1160	F14 700 760 840 880 900 980 1080 1140	F17 740 800 880 920 940 1020 1140 1200	F22 760 840 920 960 980 1080 1180 1200	F27 800 880 960 1020 1040 1120 1200				
Point Load 4.5 kN (Light Pedestrian Traffic)	35 x 70 35 x 90 35 x 120 35 x 140 45 x 70 45 x 90 45 x 120 45 x 140	340 420 560 640 580 700 920 980	480 600 780 900 800 980 1100 1160	700 760 840 880 900 980 1080 1140	740 800 880 920 940 1020 1140 1200	760 840 920 960 980 1080 1180 1200	800 880 960 1020 1040 1120 1200				
	35 x 70	NS	NS	340	440	560	640				

A minimum gap of 6 mm is recommended between decking boards to allow for good drainage and ventilation around boards.

Unseasoned decking boards should be laid tight together, with subsequent shrinkage creating the required gaps. As an example, if unseasoned spotted gum decking (45 x 120 mm) was butted together on installation, the final gap between the boards would be approximately 6% of 120 = 7-8 mm.

Seasoned decking should be installed with the required 6 mm

Design

AS/NZS 1170 (2002), Structural design actions, provides guidance on the loads required to be considered for most commercial and industrial applications.

Decking Boards

Table 4 gives the allowable spans for various grades and sizes of timber decking for a uniform distributed load up to 5 kPa and point live loads as indicated.

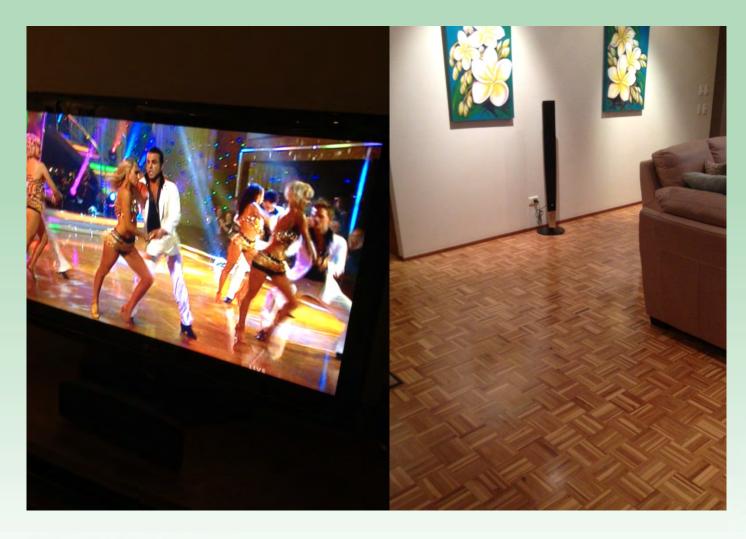
Joists and Bearers

Tables 5 and 6 provide joist sizes and Tables 7 and 8 provide bearer sizes.

- · Keep the contact area between members to a minimum.
- Make all joints self draining.
 - Where the contact area is excessive or durability in the joint may be a problem, use a preservative paste (e.g., Koppers CN Emulsion) or a bitumastic type sealer on the contact surfaces.
- Avoid bolt or nail configurations which are likely to cause splitting as the timber seasons.
- Seal all end-grain with a suitable sealer (e.g., Mobilcer-M Wax Emulsion).

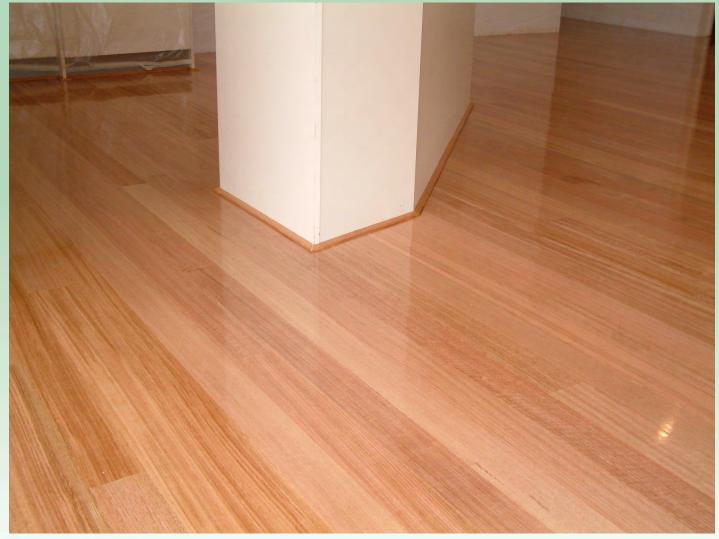


Dancing with the stars





Flooring





I Google'd images, "timber flooring" and this is what appeared



So, I'd like to reinforce a few key points made by Dave and chuck in a couple of others.



Points to consider

Flooring

- Determine EMC and likely EMC range for site
- Always assess/measure MC before laying
- Wider boards more problematic
- Dense species need robust/stronger fixings
- Don't skimp on expansion joints/allowance
- Possible impacts of different finishes



Assess EMC/environment





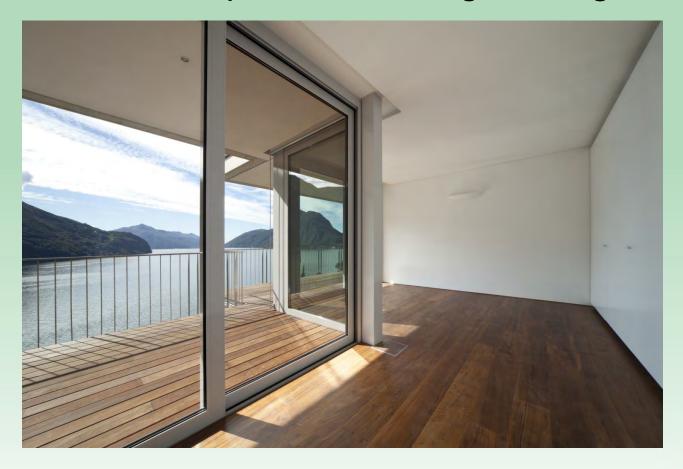
Measure MC before laying





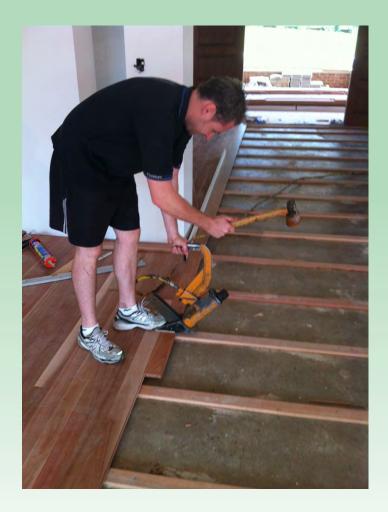


Wide boards more problematic Dense species – stronger fixings





Fixing methods are critical





Don't skimp on expansion





Type of finish



The higher the gloss, the more evident minor



More Information

TQ Technical Data Sheets



Technical Data Sheet

Treated Pine Cladding



Technical Data Sheet

Residential Timber Decks

PRESERVATIVE

TREATED PINE

(Carribean, Hoop,

Radiata, Slash)

Table 1 Species Selection



✓ H3 Treatment

(See Note 2)

Recommended Practice / March 2006

leaved by: Timber Ousensland Limited

Recommended Practice / March 2006

D's recommendations for residential

ratios etc which are exposed to the

st common timber species and deck

and stress grades refer to AS 1684

construction. For commercial and

:hnical Data Sheet 7. For decks close

less than 400 mm above ground),

Issued by: Timber Queensland Limited

Introductio

Treated Pine provi but attention mus finishing and ma

The most commo and copper azole These preservative attack. Preservati is exposed to su becoming rough



Introduction

Technical Data Sheet

Cypress & Hardwood Cladding 5

Recommended Practice / March 2006

Issued by

Some treatments

Treatment Before Fixing



Technical Data Sheet

Timber Decks Commercial, Industrial & Marine

Recommended Practice / April 2009

· marinas

Issued by: Timber Queensland Limited

Introduction

Timbers natural appeal, strength and environmental credentials continue to make it the ideal choice for decking in commercial, industrial and marine structures, including:

- · boardwalks
- · pontoons
- bridges foot bridges
- · loading docks · vehicle parking

Scope

This data sheet provides details for the design, specification and construction of timber decks in fully exposed environments (including marine) in applications for light pedestrian traffic (2.7 kN or 4.5 kN point loads), heavy pedestrian traffic (9.0 kN point loads) and light vehicular traffic (13 kN point loads) with uniform?

Surface Texture

Experience has shown that timber with a sawn upper fa greater long term weathering ability than a dressed surfa therefore should be rough sawn all round or sized on and one face (underside) only.

Arrises and Corners

A 3 mm arris should be specified on the top cornseasoned decking is available with rounded corners. Such of arrises or corners will reduce the incidence of splir improve the performance of coatings.

Table 1 Suitable Species



MIXED OPEN FOREST

Technical Data Sheet

Posts in Ground Post and Framing

✓HS Treatment
✓H3 Treatment

Residential Timber Decks Close to or on the Ground

Recommended Practice / March 2006

Introduction

When designing and building timber decks where timber is less than 400 mm from or on the ground, considerations must be

under the deck, covered with gravel or sand to keep it in place. This will help keep soil moisture from affecting the timber as well as preventing any vegetation growth.

ers should be used for these) of the dwelling to which the deck dered. This could be achieved by) for inspection (refer figure 2). It te a removable panel, to inspect caps) or to retreat where a ent to Australian Standard AS the dwelling.

Issued by: Timber Queensland Limited

Timber Floors Recommended Installation Practices

Recommended Practice / March 2006

Introduction

TIMBER

This data sheet outlines the recommended practices for laying timber strip floors over timber and engineered timber joists (it does not include steel joists), structural sub-floors such as plywood, particleboard and concrete. When laying a timber strip floors over joists, either directly on the joists or on sheet flooring fixed to joists, adequate sub-floor ventilation is essential for the satisfactory performance of the floor, Sub-floor ventilation recommendations are therefore included in this data sheet. The data sheet provides minimum fixing recommendations. Note that top nailing is a more robust fixing method than floors secretly fixed with adhesives. Top nailed floors can therefore accommodate greater movement.

should be given to alternative measures as outlined above and particular attention should be paid to ensuring that the subfloor space remains dry throughout all seasons. The type of vent may also need to be considered with buildings in bushfire areas which limits the mesh size used in vents

Technical Data Sheet

Issued by: Timber Queensland Limited

If there are doubts over the sub-floor humidity (areas of high water table, reduced airflow due to minimum clearances between the sub-floor framing and ground, external structures etc.) a polyethylene membrane may be laid over the soil (taped at joints and fixed to stumps and walls). This can significantly



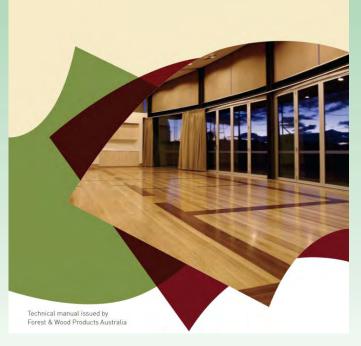


More Information

Wood Solutions
design and build

Timber Flooring
Design guide for installation









Cladding, decking and flooring

SUMMARY:

- Local resources provide you with access to diverse range of world's best timbers
- Correct design, specification, installation and maintenance will ensure satisfactory long term performance
- Information to support this is readily available



Thank you

