

Using Timber Outdoors

TECHNICAL



Colin MacKenzie

You have to get the basics right before you consider the detail

- Base durability of timber – natural or treated
- Good ventilation and drainage
- Member dimensions
- Product grade specification
- Durable connections
- Correct finishing and maintenance
- Protecting end grain

River Boardwalk – ‘Rum City’ under maintenance



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When the basics are right, then think about details

- Supplementary preservatives, joints and end-grain
- Sloping end grain, tops of horizontal faces
- Member dimensions
- No open or potential open defects on top surfaces
i.e. decking, handrails
- Hot dipped galvanised or stainless ?– coatings on HDG?
- Spirit or water based coatings – colour?
- Sealing and or plating/capping end grain

A picture is worth a thousand words so let's go



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Durability/Treatment



For hardwood, generally
Durability Class 1
limits on untreated sapwood
(CTIQ, AS 2082)
max 1/3rd of edge etc.

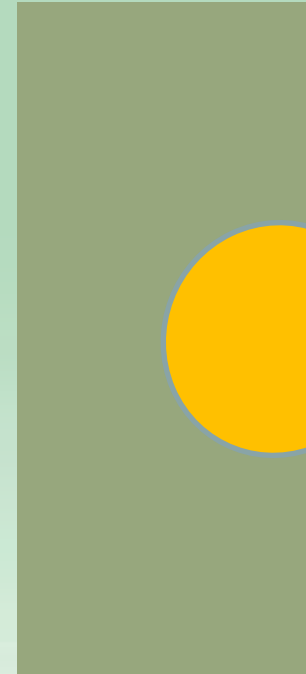
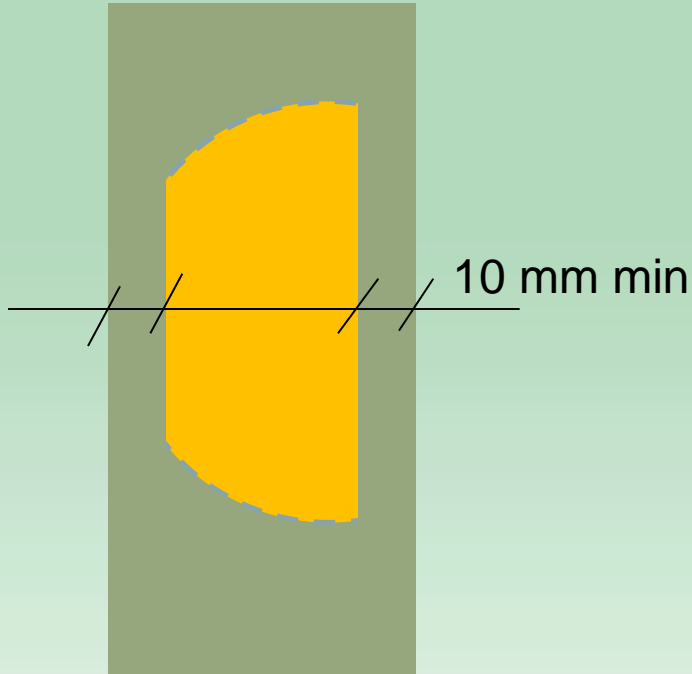
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AS 1604.1 - H4 pine treatment i.e. 'sleepers'



Max 20 % of
X sect, and max
 $\frac{1}{2}$ width of
face and $\frac{1}{2}$
thickness



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Lets take a closer look at this Cotton Tree structure



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Good

- Corrosive resistant connections
- Single line of bolts
- Good end-grain clearance

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Good

- Capping to end grain

Not so good

- Double line of bolts on beam on beam

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Bad

- No gutter and roof overhang or capping too short
- Colour?

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Why do boards cup?



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They cup mainly because of

- Moisture difference top of board to bottom of board caused by
- Full sun exposure
- Dark colour and high temperature
- Wide thin boards
- Poor sub-deck ventilation or high moisture below sub-deck



Same timber species, full sun exposure, deck on ground, but boards 'flat as'.

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Product grades and specifications



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Not all grade specifications in standards will be appropriate

- Milled product standards (AS 2796, AS 4785)
 - Decking, MC 10 to 18% - 'rubbish' I say!
 - AS 2796, select grade max hole 2mm
 - AS 2796, select grade permits tight gum veins 2 mm wide, aggregate = ½ length piece



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Connections

- Nothing less than HDG or equivalent
 - proper gal, 40 μm or greater
- Use stainless where possible/appropriate
- Free draining/well ventilated
- Minimise shrinkage restraint
- Stagger fasteners
- Pre-drill @ 80% dia. fastener
- XXX and YYY

Table 8.6: Typical protection due to zinc coating for fasteners embedded in untreated timber.

Thickness of zinc coating (μm)	Hazard Rating	Typical protection in untreated timber (yrs)		
		Acidity Class 1	Acidity Class 2	Acidity Class 3
10	HR _{un1}	>100	>100	>100
	HR _{un2}	100	16	5
	HR _{un3}	25	5	1
20	HR _{un1}	>100	>100	100
	HR _{un2}	>100	65	20
	HR _{un3}	100	20	7
40	HR _{un1}	>100	>100	>100
	HR _{un2}	>100	>100	80
	HR _{un3}	>100	80	25
50	HR _{un1}	>100	>100	>100
	HR _{un2}	>100	>100	>100
	HR _{un3}	>100	>100	40

Note: The hazard rating is defined in Table 8.4.



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ACQ treated pine decking direct to gal steel joists

Issues: broken fasteners, corrosion

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Proprietary decking
system (timber and
fixings



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Finishing and Maintenance



Use pale colours



Seal end grain



No sharp corners/edges



Water/Oil, Paint/Stain ?

and, for that natural grey weathered look -

- Either stain it first up with a semi-transparent light grey stain or,
- Apply and maintain a clear water repellent preservative.



Other



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Manilla NSW
Circa 1906



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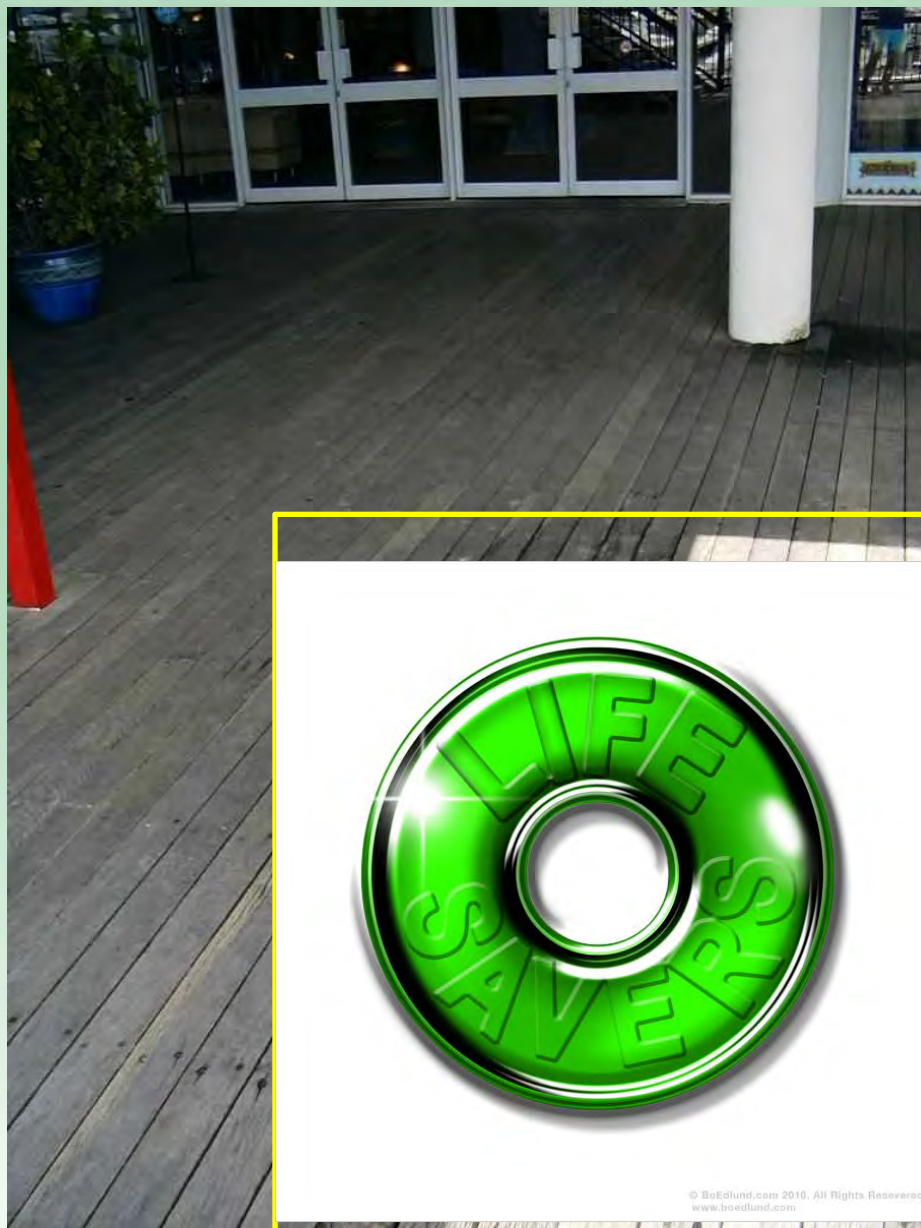


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Avoid notching members, particularly sharp notches

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And if it all seems too hard, stick a roof over it!

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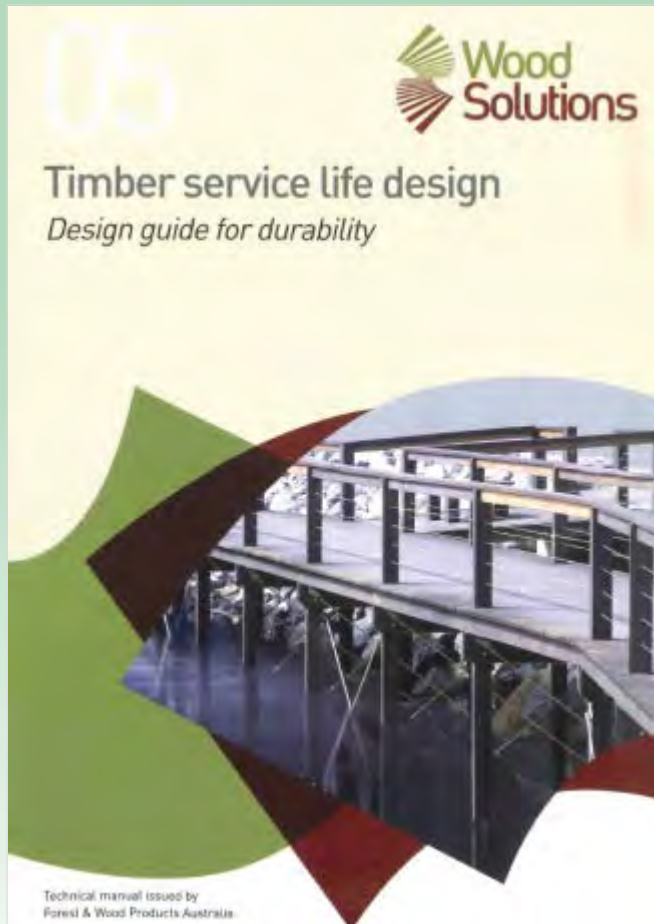


More Information

Timber Queensland Technical Data Sheet Series

2. Finishes for Exterior Timber
3. Treated Pine Cladding
4. Residential Timber Decks
5. Cypress & Hardwood Cladding
6. Treated Pine Outdoors
7. Timber Decks Commercial, Industrial & Marine
8. Timber Garden Walls (Up to 1 metre high)
9. Timber Retaining Walls Residential
13. Residential Timber Decks Close to or on the Ground
19. Pergolas and Carports
20. Residential Timber Fences
25. Outdoor Timber Performance

More Information



Technical Design Guide Timber Service Life Design



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Thank you



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