

Ted's News

February 2023

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[Fastening Domestic decking to Steel Joists](#)

Not a paid commercial



When I was writing my [LifePlus Decking Guide](#) I wanted to include information about how to fasten it to steel joists. We knew people had had problems with timber through incorrect species selection and poor building practices and that they thought that going to steel would solve the problem. The outcome of that was [Bluescope issuing guidelines](#) saying they would not guarantee their products in what amounts to the usual way their joists are used in conjunction with decking. [I suggested a fix for this in December 2018.](#)

All people were doing was swapping well-known and easily solvable issues for others that were less well-known. My screw supplier at the time was Buildex, a very reputable company but they had emailed me that they would not certify their screws going from timber to steel. Check other steel joist manufacturers' recommendations and you see that they also do not recommend screwing decking to joists. Hardened screws are too brittle and can snap leaving trip hazards as the image below shows.



One company that does make screws for this application is Simpson Strong-Tie and I asked my friend Matthew Smith, their National Field Engineer - Australia, to write about this easily solvable problem. I had been specifying their product for this difficult application for years. Over to you Matthew:



Fastening timber decking to steel joists can be a challenge. There are a number of potential issues with timber decking materials that need consideration when selecting an appropriate fastener.

Timber shrinks and swells as it reduces and gains moisture, respectively. In timber decking, virtually all of the moisture-related dimensional change occurs in the cross-section of the board (thickness and width), while at the same time, there is a slight change in length. In addition to shrinkage and swelling in the cross-section, timber can warp, twist, cup, and bow as it gains and loses moisture.

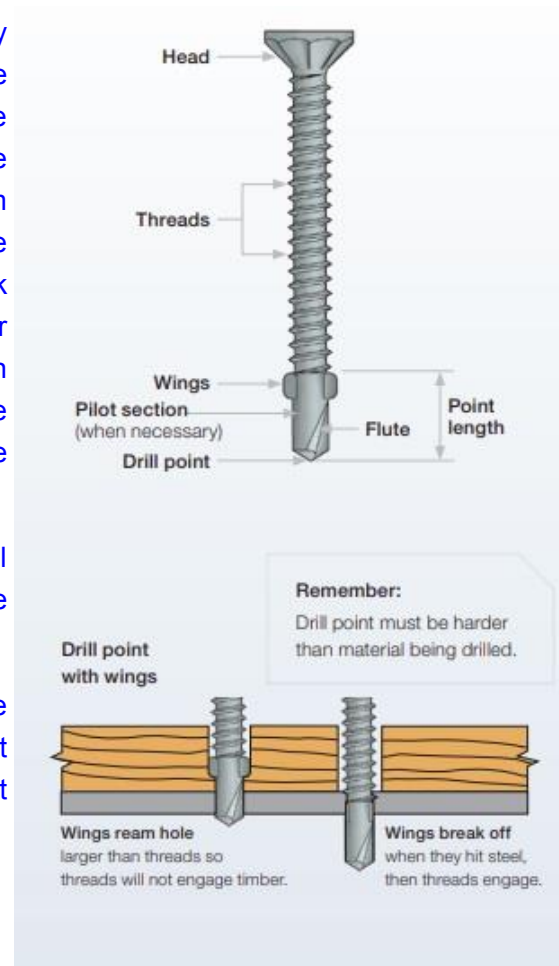
The moisture content of a timber deck in service depends on the season of the year, the local environment, and exposure. A timber deck could be as low as 8% moisture content in the summer in some Australian locations, and it might exceed 18% at other times of the year.

Fluctuations in moisture content in the timber will cause the fasteners to be loaded by dimensional changes due to shrinkage and swelling. It is recommended that the best long-term solution for timber deck fastening is stainless steel screws, which have the ductility to allow for shrinkage and expansion of the timber and provide good corrosion resistance.

The best fasteners are bi-metal screws or specially designed decking screws. The bi-metal screws have a hardened drill point and leading threads that are fused to stainless steel shanks and heads. This type of screw can drill through the timber decking, form threads in steel, and provide corrosion resistance and ductility, which contribute to long-lasting deck surfaces. Having wings also help reduce jacking or riding of the decking by reaming a hole larger than the thread so that the thread does not engage the timber. Wings break off in contact with the steel. See the image on right.

Note that screws must be long enough that the drill point and the first three threads protrude through the steel framing.

If you require further information on the appropriate fastener for your decking project, please contact your local Simpson Strong-Tie representative at 1300 STRONGTIE



Using Internal Flooring as Decking



There is probably not much need to say anything is there? The 3 mm or so gap used when laying decking allows the timber to expand or shrink as it wishes.



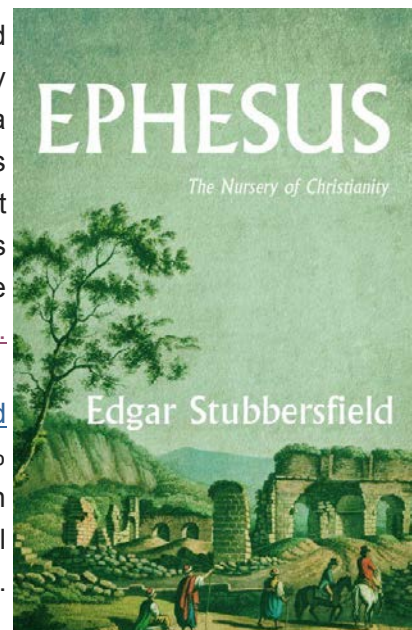
Image courtesy of Colin Mackenzie, Timber Queensland

Mind you, you also need to be careful using tongue and groove internally as well. If you do not add the expansion provisions as required the floor will still grow and can force the wall out of alignment or pull the joists off the bearer.

[Something for Lovers of Ancient history](#)

When I started my Master's degree it was a long time since I had researched anything so I thought I would get back in practice by examining the ancient city of Ephesus. Recently I undertook a major review of the book and it was published by US publishers Wipf and Stock. It is well-referenced and there are some great images. Did you know that the temple of Artemis in Ephesus was one of the seven wonders of the ancient world and was three times the size of the Parthenon in Athens? [Here is an excerpt.](#)

If you would like to read this book, log into my page at [Wipf and Stock](#) and order using the code EPHEBUS. There will be a 40% discount till the end of March on it and all my other books with Wipf and Stock. Australian readers can order from Koorong. It will be in stock in some stores (no discount, unfortunately).



Free Guide to Timber Handrails

In December I introduced my latest timber guide which distils my extensive experience with timber handrails. Unlike my other timber books, this one is free. There should not be a professional office in the country without this book. If you did not request it last month, please do so this month. It can head off a lot of grief.

"Extraordinary, the amount of detail it contains. Good well-researched and knowledgeable information," That is how my guide *Timber Handrails* has been described. This is the 22nd guide I have published and No. 13 in my *Timber Design File* series. It is written mainly to meet the needs of commercial handrails but has some important content relating to domestic rails, particularly LOSP treated pine. This guide will give you timber specifications that work and with 127 images you will understand best practices.

The chapters are:

- Introduction
- Timber specification and explanation
- Best practice in design
- Standards
- Fixings
- Posts
- Wire ropes
- Case histories
- Design checklist

[Here is a link to the index](#)

To receive this book simply email [Fiona MacWilliam at BCRC](#) and she will send you a copy and also the design checklist as a word document. *Why do you need the design checklist as a word document?* It allows you to put your corporate logo on the top and so serves as an official design brief and also your check that best practice has been adopted. Remember, a poor design brief will likely result in a less-than-satisfactory outcome. Don't think that a roof truss specification will work in this specialised application.

I plan to add a chapter to the book on steps as there is so much common ground. Unfortunately, I am short of images, good or bad. Can anyone assist me with images and stories about steps?

If you want handrail sizes, you still need my [Commercial Barrier Guide](#) for \$22.

Recommended Species List

Species	Percentage of harvest from Qld State forests	Percentage of harvest from NSW State forests	Fire resistance AS 3959-2009	Termite resistant AS5604-2005	Lyctus susceptible AS5604-2005	In-ground Durability AS5604-2005 or CTIQ	Above-ground Durability AS5604-2005 or CTIQ	Playground use in-ground AS4685 or CTIQ	Playground use above-ground AS4685 or CTIQ	Interlocked ground	Dry weight kg m ³	Shrinks tangential to 12% MC	Greasy to touch	Royal species	Notes
Ash-silvertop <i>E. sieberi</i>	NSW/Vic/Tas	0.12	Y	N	N	3	2	N	Y	O	820	10.6	N	N	1
Ash-Victorian <i>E. delegatensis-E. regnans</i>	Vic		N	N	Y	4	3	N	N	N	680	8-13	N	N	
Blackbutt <i>E. pilularis</i>	4.58	15.84	Y	Y	N	2	1	Y	Y	N	930	7.3	N	N	1
Box Grey <i>E. moluccana</i>	1.57	0.08	N	Y	Y	1	1	Y	Y	N	1105	7.5	N	N	
Brigalow <i>Acacia harpophylla</i>			N	Y	Y	1	1	Y	Y	N	1025	3	N	N	
Cumaru/Tonka <i>Dipterocarpus odorata</i>	Imported		N	N	Y	(1)	(1)	Y	Y	?	900-1300	7.7	N		
Cypress-white <i>Callitris glauca</i>			N	Y	N	2	1	Y	Y	N	675	3	N	N	
Ironbark-broadleaved red <i>E. fibrosa</i>	7.02	2.01	N	Y	N	1	1	Y	Y	O	1120	6.5	N	Y	
Ironbark-narrowleaved red <i>E. crebra</i>	4.60		N	Y	N	1	1	Y	Y	Y	1090	5	N	Y	
Ironbark red <i>E. sideroxylon</i>	Not-listed		Y	Y	Y	1	1	Y	Y	Y	1190	7	N	Y	

Last month I accidentally saved the link to my recommended species list as a PDF instead of as a word document. [Here is the correct link](#). It will be better as an A3. The information taken from *Timber in Playgrounds* is drawn from a number of Australian Standards, *Construction Timbers in Queensland*, *Bootles*, *Wood in Australia*, and years of experience. It covers both sawn and round timber. It is applicable to anything to do with weather-exposed timber, e.g., fences and bollards. It assumes the timber will be H3 treated. [Purchase the guide here](#) (or order hardcopies [direct from Amazon](#)).

When Ralph Bailey and I wrote *Timber in Playgrounds* we provided a resource that explained current best practices in the specification, design, and, construction in that field. We entertained a naive hope that councils would outlay \$55 so they knew what they were dealing with before spending considerable funds on potential short-lived and even dangerous money pits. Likewise, we hoped that designers would work through the checklist so they could be assured that potential issues had been addressed. There should not be a council or landscape architect without this book but very few have it. The contents cover just about everything to do with any weather-exposed timber item, whether it be a fence or a bollard. If you have not ordered this book, you really do need it.

Here is a [link to purchase a PDF](#)

Here is a link to [purchase a hard copy from Amazon](#)

Signup for One of my Ten CPD Courses



Learn from my four decades of experience with these CPD training sessions, some of which are available in eClassroom.

Topic 1	Timber Preservation	
Topic 2	Hardwood Grading	
Topic 3	Timber Decks - Designing for Durability	
Topic 4	Utilising Small Diameter Hardwood	
Topic 5	The Seven Deadly Sins of Timber Design	eClassroom link
Topic 6	Timber Joints	
Topic 7	Architectural Timber Battens	eClassroom link
Topic 8	Timber 101	eClassroom link
Topic 9	Boardwalk Design (recommend delivered with Timber 101)	
Topic 10	Timber Handrail Design	

[Click here to learn more about these courses](#)

Are you aware that [Wilson Timbers/Outdoor Structures](#), who I am affiliated with and are suppliers of quality timber, will have me come to your office (in person or remotely) and deliver one or two of my CPD sessions for free? The only condition for in-person presentations is that, with travel, we can do it in a day from Brisbane in Queensland. [Contact Stuart Madill by email to arrange a time](#) or call his mobile 0403 385 707.

[Need a Timber Consultant or Expert Witness?](#)

I have over 45 years of experience in the industry and can assist you with many of your timber needs.

Inspection – I can assess timber products on their performance, fitness for purpose or cause of failure. I also examine whether best practice was used in design and construction. I have recently completed inspections on boardwalks, bollards, support beams and external timber furniture.

Grading - Quite literally, I have written the book on the subject. Recent experience has shown that up to 30% of timber supplied may not be to grade.

Design - I can provide detailed technical drawings and advice. I can also review already prepared drawings.

Reports - I have authored many books on timber and can prepare a report providing recommendations and practical instructions on to how to rectify issues.

Trainer and Presenter – I can provide tailored training to meet your CPD needs and also have experience at lecturing to universities and presenting at conferences.

Please note as I am now employed as a Senior Timber Consultant with the firm BCRC all large and complex consultancies and requirements for an expert witness will be handled in conjunction with them. Existing consulting arrangements remain unchanged and I am also available to assist on small projects. For more information see www.bcrc.com.au or [download their capability brochure here](#).

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