

Ted's News

April 2020

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Face to face training is going to be difficult for a while yet. Fortunately, [eClassroom](#) has two of my CPD courses that you can undertake in the safety of your home, [Outdoor Timber: Design and Specification](#), and [Architectural Timber Battens](#). Coming soon to eClassroom will be three new courses - *Designing for Durability* which explains how to lay out a commercial deck, *The Seven Deadly Sins of External Timber Design* and *Timber Joints*. Hopefully all will be ready for the last-minute rush to get CPD points.

Using Heart-In Timber



House of the Five Senses, Efteling amusement park, Netherlands
Image by Stefan Scheer - Own work, CC BY 2.5,
<https://commons.wikimedia.org/w/index.php?curid=1346512>



Service Station, South Africa



Safari Lodge, Kenya

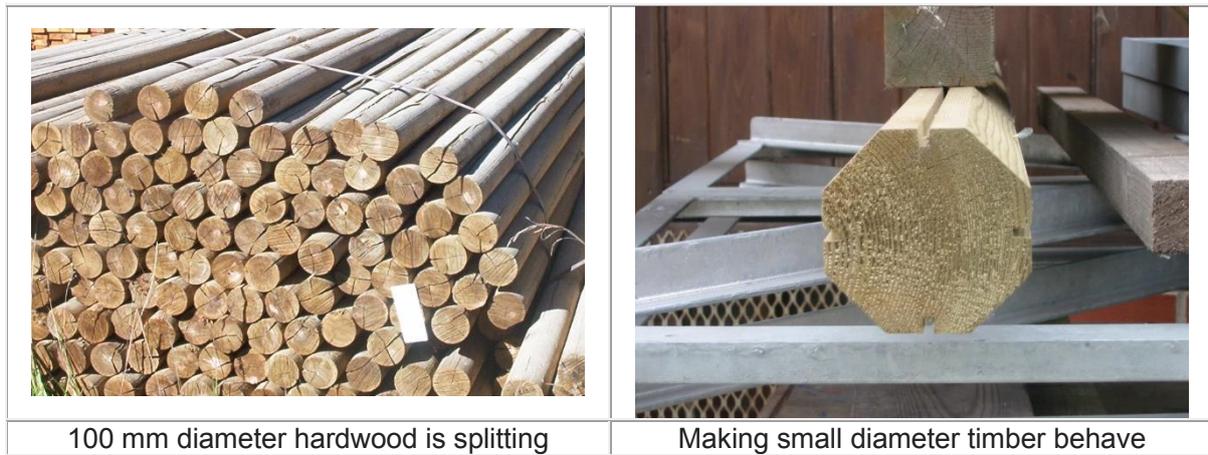


Earth centre UK
Image courtesy Feilden Clegg Bradley



Conference centre, Philippines

Last month I had an article about the [inappropriate use of 150x150 heart-in posts](#) that were part of a viewing platform that was started opposite my home. Now you could easily think that I am opposed to the use of heart-in timber, but nothing could be further from the truth. I am only opposed to its inappropriate use. Take these five images above which all use heart-in timber in applications from the simple to the extreme but no one can say from these that it is a material that stifles creativity. It is a different aesthetic but not a bad one. At the moment I am working on my Magnum Opus (which has nothing to do with timber) but, after that, I may have one more book left in me, the use of small diameter hardwoods. Need a commission though. I did start and the pictures above are from the case histories. [If you want to know more Here is a link to them.](#)



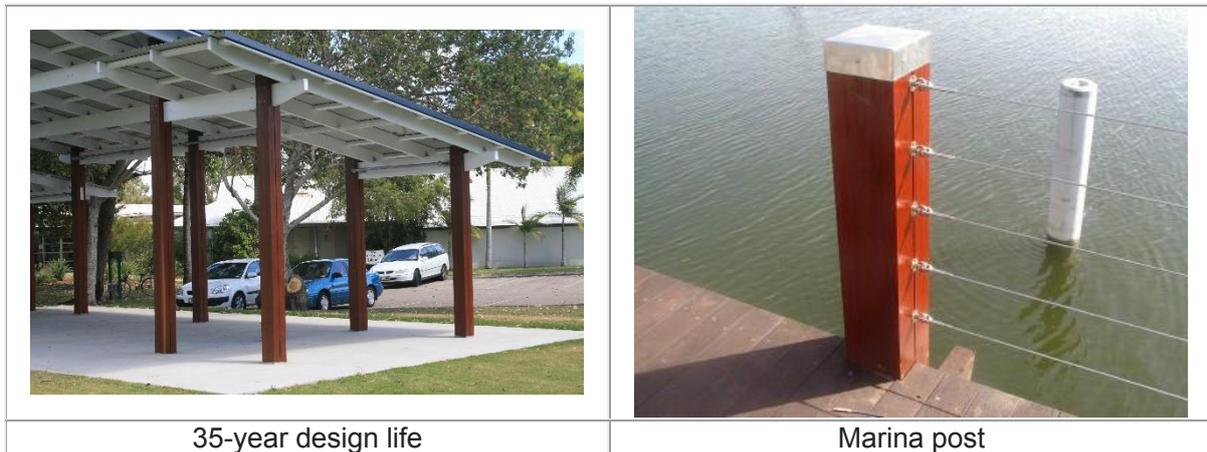
Natural rounds tend to split at the ends, especially when they are too small (refer to the image to the left) which is why I developed the [Pole Cat](#) which is manufactured by Pryda. My experience with spotted gum led me to not stock anything under 200 mm. The image to the right shows a successful attempt to make them behave, at least in pine. Connections are not easy with natural rounds.



Sawn heart centre hardwood can have more issues than natural rounds. Because the outside is losing moisture and shrinking and the inside is still moist and so remaining

the same size, something has to give. Generally, it tears down one face as you can see in the image entitled "wrong". So following the lead of my Japanese customers from the past I introduced a single expansion groove so we had a straight line that could simply open and close at will. It was a success but, generally speaking, there could be too much movement. After experimenting with a groove on each side I purchased a planer that could dress 300x200 hardwood and tooled up to produce a product I called the [Pioneer Post](#) which is still available through Outdoor Structures Australia. It was a success.

While I criticised the inappropriate use of heart-in 150x150 last month, exactly the same starting product, this time in ironbark was prepared by me in the same way as my [Pioneer posts](#) and these shown in the image "Right" above. If they are set in "no fines" concrete I recommended they will give long service and age gracefully. Notice the cap? Capping the tops is not an option for weather exposed vertical heart in timber, you must do it. Structural sawn timber has a restriction on heart for very good reasons.



Here are some images of good applications using Pioneer posts where the heart has been tamed. Contact [Stuart Madili](#) of Outdoor Structures Australia for pricing and availability on this product Ph 0403 385 707.

[Which Hardwood Grading Standard should I Use?](#)



In December 2018, one of the 100-year-old timber posts at the Royal Hotel here in my home town had to be replaced. The builders used a piece of select grade, heart free, dressed spotted gum ex. 150x150. Because the posts are joined at the verandah and a smaller size used on the second level, it was in the realm of what was still available, but it still took months to supply. [See this extract from a 2014 newsletter relating to another hotel where the posts were one piece and needed a different approach.](#)

Last month I had [an article about the incorrect use of 150x150](#) which explained how structural posts used in a deck under construction opposite my home did not meet the requirements of *AS2082-2000 Timber—Hardwood—Visually stress-graded for structural purposes*, the edition of the standard that applied at the time. One of my readers asked, “Shouldn’t I have used *AS3818.7-2010 Timber – Heavy structural products – visually graded Part 7: Large cross section sawn hardwood engineering timbers?*” My understanding is that commercial decks like this do not come under the BCA as they are not residential structures or one of the nominated inclusions of the Code so it is a very fair question. A domestic deck requires AS2082. The Heavy Structures standard applies to timber with a cross section of 0.016 m² i.e. larger than 200x75. So, with 150x150 having a cross section of 0.0225 m², it can fall within the scope of AS3818.7-2010 but also AS2082-2007 (the latest edition) and both give rules to achieve a given F rating. Frustratingly they are not the same rules, so which should you be specifying when designing outside the BCA?

As far as my experience goes, I could probably count on my fingers the number of times I have seen AS3818.7 called up on commercial decks, more often it is just "F17 hardwood" which then leaves it open to interpretation which standard is used if it is bigger than 200x75. Invariably, almost all my timber sizes came under AS2082 and my training was with this and other domestically orientated grading standards. So, let us look at how they compare using a piece similar in size to the hotel post, 150x150 in unseasoned spotted gum, a Strength Group 2 timber and assume it is 3.6 m long.

Firstly, in durable timber, AS2082-2007 envisages that our 150x150 post can be specified in eight possible ways which the industry loosely calls "grades". (I am ignoring A17 as it relates to kiln dried low durability Victorian ash making it totally unsuitable for external work and KD sizes above 50mm thick can't be supplied commercially.) These eight "grades" describe what the timber looks like, not how strong the timber is, and are Structural Grades 1 through to 4 and all are available in an appearance grade. Refer to my book [Grading Hardwood](#) for an explanation of how this relates to Structural F Grades. Some of these eight possibilities are extremely low quality and I have heard them referred to in the industry as “hippie grade” which fitted the stereotype of the people who intentionally purchased them. These low grades may work satisfactorily inside but deteriorate far quicker when used externally so are not something that should be specified by professionals for external work. AS3818.7 only has a standard grade and a select grade. For AS2082, I have listed F17 (Structural Grade 2) F22 (Structural Grade 1) and F22 Appearance Grade (Structural Grade 1 with the additional requirement) and for AS3818.7 there are only the two options.

Note: I have written several times about the implication of the change regarding included heart between the 2000 and 2007 version of the AS2082. [It is a minefield for designers](#). You will see this explained in my [CPD sessions](#) and books [The 7 deadly Sins of External Timber Design](#) and [Grading Hardwood - Understanding AS2082](#).

Grades	AS2082-2007			AS3818.7-2010	
	SG 2 F17	SG1 F22	SG1 + App F22 App	Standard (F17)	Appearance (F22)
Heart centre	Yes	No	No	No	No
Sound knot	37 mm	21 mm	21 mm	37mm	25 mm
Unsound knot/hole	37 mm	21 mm	No	25mm	25 mm
Want/wane	1/5 x section	1/10 x section	1/10 x section	1/5 x section	1/10 x section
Borer holes <3mm	20 in 100x100	12 in 100x100	12 in 100x100	unlimited	unlimited
Termite galleries	1/5 xsection	1/10 x section	No	Up to 25mm deep	Up to 25 deep
Loose Gum veins	1/6 length	1/10 length		300mm per 2 metre	300mm per 2 metre
Rot	150x100x3	150x100x3	No	No mention	No mention
Bow/Spring	13 mm	13 mm	13 mm	25 mm	25 mm
End split	100 mm	100 mm	100 mm	180 mm	108 mm
Simplified comparison of 150x150 spotted gum at 3.6m using AS2082 and AS3818.7					

So, looking at the simplified table I would say that both have their strengths e.g. AS3818 avoids the possible specification of "hippie grade" while AS2082, in the grades shown requires straighter, better looking timber. You can only hope to receive spotted gum 150x150 free of heart similar to that used in the Royal Hotel if you specify it as F22 or F22 Appearance grade to AS2082 or to either of the grades in AS2818.7 (don't count on it though, you need to check and I can do that). Timbers that are Strength Group 1 would need even more care with AS2082.

The problem is getting a mill to supply to AS3818.7 when you have enough troubles getting it to AS2082. Their graders are seldom trained in the less common standard (if trained at all or even have a copy of AS2082 let alone AS3818.7), and a course is not offered by Queensland based trainers though [Timber Training Creswick Ltd](#) do offer it. Their course is mainly for railway timber but adjust as necessary to the client's needs. While most of their trainees are in NSW and WA these courses are offered

Australia wide. Rob Rule, the Manager of Timber Training estimates that the ratio for training is 20 to 1 for AS2082 and AS3818.7. So personally, to keep life simple, unless you are only dealing with specialist suppliers, and you won't be if you are getting three prices, I would avoid it. So ,for framing timber, not decking, keep to AS2082 but remember where to be careful about specifying permitted heart ([you can always engage me as a consultant to guide you](#)). Decking is a completely different matter.

Another consideration is that you should be trying very hard to keep your sizes to a maximum of 200x75 and ideally smaller. It is just a simple matter of the available log size.

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

I have over 40 years' experience in the industry and can assist you with many of your timber needs.

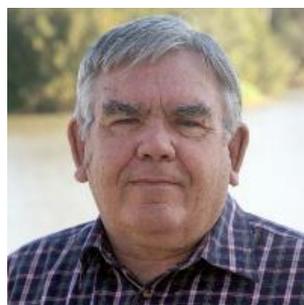
Inspection – I can assess timber products on their performance, fitness for purpose or cause of failure. I also examine whether best practice was used in design and construction. I have recently completed inspections on boardwalks, bollards, support beams and external timber furniture.

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.

Please note as I am now employed 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



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