



November 2011 Newsletter

Contents

- **F17 and F11 KD HW Specification**
- **150x150 Bollards**
- **Specifying Timber Handrails**
- **Quote Request for Steel Bridge**
- **Quote Request for Timber Bridge**

F17 and F11 KD Hardwood Specification

There was a grade of timber known loosely in the trade as hippie grade. The older readers will remember these people, unusual clothes, unusual hairstyle, sometimes unusual hygiene and definitely unusual cigarettes. They would purchase timber that had been rejected by people who themselves would only buy second class.

Hopefully none of my readers would ever specify hippie grade but I am afraid it is happening with increasing frequency hidden under AS2082 as F17 and F11 kiln dried hardwood! The site where these KD F17 images above were taken had a structure built recently where the decking was specified as our Deckwood but the joists were initially specified as F11 KD, two grades lower than shown in either 125 or 100x50.

Three things affect timber grades, the inherent strength of the species used, the amount of natural feature in the timber and whether the timber is green off saw or kiln dried. Each hardwood timber species is given a Strength Group (S) rating e.g. Red Ironbark is S1. Spotted Gum is S2, Forest Red Gum is S3 and Teak, marketed as a premium timber is as low as S6.

Timber quality varies dramatically too and AS2082 recognises 4 grades with Structural Grade 1 being the highest quality and Structural Grade 4 being the lowest. Industry standard grading is Structural Grade 2. To understand what these grades mean look at the drawing above which shows the theoretical cross section of F11 to F22 green of saw Spotted Gum.

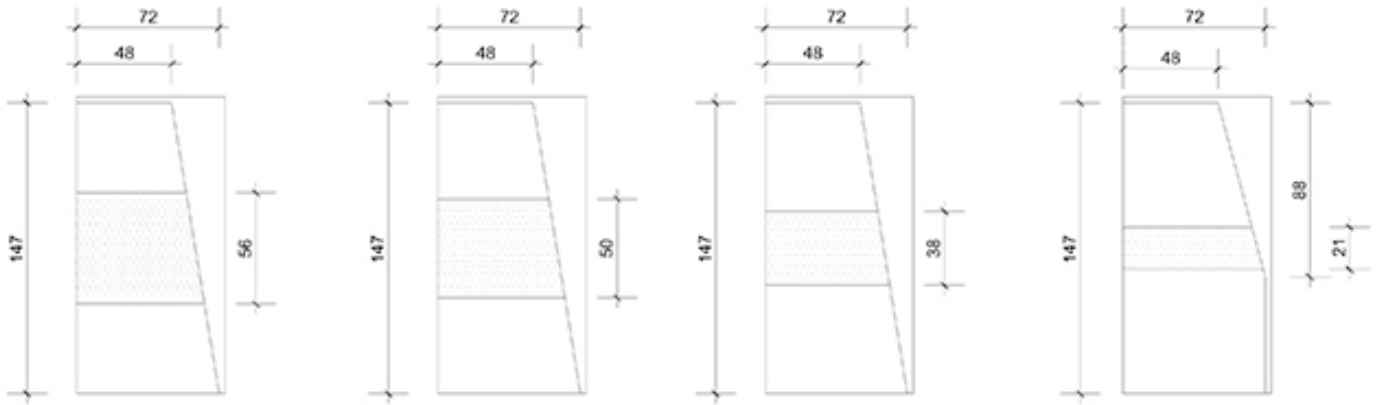
With the lower grades, there is no connection between the amount of defect allowed and what designers expect to receive. The table below shows the strength of the timber by structural grade compared to that of timber without any natural feature.



F17 KD hardwood.



F17 brand with supplier's name removed



F11 SG GOS
20% loss in section
unsound knot 3/8th face

F14 SG GOS
20% loss in section
unsound knot 1/3rd face

F17 SG GOS
20% loss in section
unsound knot 1/4 face

F22 SG GOS
10% loss in section
unsound knot 1/7th face

STRENGTH GROUP 2 - E.G. SPOTTED GUM

Unseasoned Spotted Gum F Grades to AS2082

Structural Grade:	% of clear wood strength
No. 1	75%
No. 2	60%
No. 3	48%
No. 4	38%

The effect of kiln drying is to effectively increase the strength of the most appropriate SE Queensland timbers for external use by 2 strength groups. So when the strength group, structural grade and moisture content are known, by looking at the two tables at the back of AS2082, one for unseasoned timber and the other for seasoned timber we can determine an F grade. So, for spotted Gum we have the following.

	Structural No. 1	Structural No. 2	Structural No. 3	Structural No. 4
Unseasoned:	F22	F17	F14	F11
KD	F34	F27	F22	F17

Structural Grade 2, a reasonable structural grade (but definitely not an appearance grade) produces F17 in green off saw Spotted Gum and the same grade in KD is F27! What should be then say about F17 KD in Spotted Gum or even Blackbutt which, by working backwards is the lowest grade that is conceived of? It is simply the reject of an F27 run (remember F17 KD Spotted Gum is only 38% strength of solid timber). Further what do we say about F11KD in the same species? It is two grades below anything ever conceived of and would be about 25% the strength of solid timber. Clearly your clients deserve better.

What of those 50mm F11 joists I mentioned? We advised the architect that the joists were not according to our technical guides and that not only would they split down its length as the screws had to be in a straight line, if 100mm thick was used, they could be expected to split from face to face as well.

My competitor came along and said problem? What problem? and got the order. I would expect



Underside of 100x50 joist. Notice the split along the length!

that in a few years time the screws will start to come out and be a trip hazard. It is tragic. One day I will learn not to care.

Specification of low quality timber leads to premature failure and precludes any successful tender by a supplier with appropriate grades. At the end of the day weather exposed timber structures should not be designed for strength but for durability and when you do this you find F grades mean very little. Follow the link to the newsletter dealing with design for durability.

Links

Designing for durability (April 2010 newsletter)

http://www.outdoorstructures.com.au/pdf/osa_newsletter_04_10.pdf

Timber Grades What they mean

<http://www.outdoorstructures.com.au/timber-grading.php>

150x150 Heart Centre



150x150 bollard split in two



150x150 bollards used successfully on Thursday Island as detailed by OSA

When I interviewed someone for a job a while back, I told him that people that work for me tend to become religious very quickly. What do you mean, he asked. Well before too long I will hear you say *Lord give me strength*. When I saw the images of the split bollards at a very well known tourist attraction I had a give me strength moment. It is the same site where the F17 timber images and F11 KD Joists mentioned above are from. I could understand if the owner said we will never use timber again.

Who is to blame: the designer for ignoring advice and not knowing the product he/she was asking for, or the supplier who should know his product intimately and advise against using it like this. The joy of a quick easy order is not to be compared with the damage caused to the industry by a disgruntled customer and even millions of people seeing this product. Timber as such is not at fault, it is like saying I will not use steel because it rusts. We accommodate the weakness of steel and we should do likewise with timber.

Design professionals should go out of their way to avoid 150x150 hardwood and when heart in material cannot be avoided, take steps to tame the heart and cap the top. Our pioneer post does just this. My website has a lot of information about how to utilize heart in material, follow the links below. Look at the picture and check out what we have below and then you can understand why we get frustrated.

Links

Warning about 150x150 in landscaping

http://www.outdoorstructures.com.au/pdf/etdn_5.pdf

Correct use of heart in hardwood

http://www.outdoorstructures.com.au/pdf/etdn_3.pdf

Background to Pioneer Post

http://www.outdoorstructures.com.au/pdf/pioneer%20post_bkgnd.pdf

Pioneer Post brochure

http://www.outdoorstructures.com.au/pdf/pioneer_post.pdf

Well detailed heart in posts

<http://www.outdoorstructures.com.au/gallery.php?gid=92&SID=22>

Specifying Timber Handrail



OSA's Queenslander P4 handrail system with OSA grabrail



OSA C4 Bikeway rail with extra grabrail and kerb

I was asked recently how to specify timber for handrail according to AS2082. I had to think as, quite frankly, we ignore it and produce a product suitable for application. What is the correct way to do it? I tabled two species (Spotted Gum and Ironbark) in two of the best grades (F22 and F17 exposed) and compared them.

Defect	F22 SG	F22 IB	F17 EXP SG	F17 EXP IB
Want and wane	10%	20%	No	No
Gum pockets	300MM	300MM	No	No
Loose gum veins	1/10th length	1/6th length	No	No
Tight gum veins	Unlimited	Unlimited	Unlimited	Unlimited
Sound knot	21mm	38mm	38mm	50mm
Termite galleries	Surface	Surface	No	No

I came to the conclusion that neither standard was completely suitable for specifying handrail. Timber Queensland confirmed my conclusion. A suitable specification for dressed timber handrail would be something like this:

Royal Species (including Spotted Gum), Structural Grade 1, the order on the timber supplier is to state that the timber is required for handrail and to over-order by 10%. This allows for 5% of the timber supplied being out of grade (AS 2082 2007 1.10.3) and a further 5% is allowed for defects that are below the surface and will be exposed when the timber is dressed.

While it might seem extravagant it really only means that a few of the longer lengths need to be ordered. The cost of setting up a planer a second time if you are a piece short is usually more than having spares.

Links

Commercial Barrier Guide

<http://www.outdoorstructures.com.au/pdf/commercial-barrier-guide-10b.pdf>

Regards

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Bridge Quote Requests

If there is any doubt that OSA make the best kit bridges in the country look at the [Berrinba Wetlands Project](#). Not all bridges are equal. After encountering three bridges in one month that did not meet the Bridge Code I wrote the [May 2010 Newsletter](#). Refer to the May OSA Newsletter when assessing the suitability of quotes.

Steel Bridge Quotation Request Form

http://www.outdoorstructures.com.au/bridge_request.php?Mode=st

Timber Bridge Quotation Request Form

http://www.outdoorstructures.com.au/bridge_request.php

More information:

If you have timber road/rail/heritage bridge issues, we suggest you talk to:

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