

# Outdoor Structures Australia

## July 2015 Newsletter

Written by Ted Stubbersfield

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Dear Reader

### [Changes to Traffic Barriers and Bollards](#)



Shore bollard now available in 145x152 size



New hole shape in heavy duty barriers

Last month we introduced a new prestige bollard, the Shore which incorporates two 190x90 pre-leached hardwood pieces either side of a 12 mm thick support. We have had two customers seek a lighter version so we have added a new bollards with utilises two 145x70 pieces. I have a

added a cad drawing and PDF in the design tool section. While there, look at the custom eclipse bollard. [Here is a link to the design tools](#)



Some time back I noticed that the tops of the 50 mm rails were showing degrade after 20 years so I changed all or rail designs so they shed moisture. The radius on top of the traffic barrier is about 6 mm. Does it work? i will tell you in another 15 years or so but it seems reasonable practice. **This attention to detail is what separates an OSA product from the others.** Improved manufacturing techniques have allowed us to change the shape of the

hole we put in our traffic barriers and it now has a matching radius. The hole is 2 mm larger than rail.

### [Your Opportunity to Inspect Forestry Research Centre](#)





Lock the date Wednesday 5th August into your diary and come down to the Blomfield Street Salisbury research facility of the 1.30 pm to 3.30 pm? If your career is ahead of you, not finishing like mine, you need to be very aware of the radical changes that are occurring in both timber supply and the products that will be made from it. Right at the cutting edge is Henri Bailleres and his remarkable team of scientists and technicians. Henri would love to show you around the facilities and discuss the new directions for timber. You will see:

Material testing laboratory,  
Plywood facility  
Kilns  
Practical constructions  
Vacuum drying  
And lots more

You will have the opportunity to study the above shelter. What makes the above shelter impressive is not the design, though you have to admit Michael Dixon of UQ's architecture department has done a great job, (note no visible fixings) but it is the fact that it is built from 12 year old plantation hardwood! This shelter incorporates both laminated beams and LVL in hardwood.

If that is not enough reason we will finish up with a CPD session on the Seven Deadly Sins of External Timber Design. Phone me on 0414 770 261 for the RSVP.

[When to Use Stainless Bolts and Brackets](#)



Galvanised bolt after 12 months in spotted gum in Gatton

In light of the deteriorating performance of imported galvanised bolts (and they are all imported) and the wide divergence of opinion from different sources of when to use stainless fasteners, I thought it would be useful to give you my observations.

Species	pH	Trouble
Blackbutt	3.6	yes
Mountain ash	4.7	no
Ironbark red NL	4.0	yes
Spotted gum	4.5	no
Rose gum	5.1	no
Jarrah	3.3	yes
Radiata	4.8	no

Source: Embedded Corrosion of Metal Fasteners in Timber Structures FWPA Manual 6

Firstly you have to consider the acidity of the timber. Our hardwoods are all acidic. Spotted gum with a pH of 4.5 is outside of the problem area of 4.3 or less. So if you are just saying F14 hardwood and not being careful about what species you accept, you must anticipate and design to avoid corrosion on your bolts. The new timber treatments are also more acidic than CCA and are more likely to corrode fasteners. But what are the recommendations?

**Timber Preservers Association recommendation:**

For higher corrosion resistance in marine, salt or chemical environments hot dipped galvanized nails and screws should be used. Hot dipped galvanising involves the application of a relatively thick sacrificial zinc coating by hot dipping in a zinc bath. The process leaves a rough surface with enhanced withdrawal and corrosion resistance characteristics. [Click her for source](#)

**Koppers**

**Micropro**

High Hazard Zones. These are zones that are up to 10km from a surf coast or up to 1km from a

non surf coast or near swimming pools, brackish water etc. In these zones Type 304 or Type 316 stainless steel hardware is suitable. [Click here for source](#)

## Lonza

### Copper Azole and CCA Treated Wood <sup>(1)</sup>

	Indoors Always Dry (<15% MC)	Protected From Weather Dampness OK	Outdoor In Weather Regular Wetting	Coastal Applications	Wood Foundation & Other Critical Applications
AWPA Use Category	UC 1	UC 2	UC 3, UC 4A	UC 3, 4, 5	UC 4B
Fasteners	Mild Steel, EP <sup>(2)</sup> HDG HDG per ASTM A153 MG per ASTM A695 Class 55 Copper 304/316 SS	HDG per ASTM A153 MG per ASTM A695 Class 55 Copper 304/316 SS	HDG per ASTM A153 MG per ASTM A695 Class 55 Copper 304/316 SS	304/316 SS	304/316 SS
Connectors – Light gauge steel	HDG <sup>(3)</sup> HDG - ASTM A653 Class G185 Copper 304/316 SS	HDG - ASTM A653 Class G185 304/316 SS	HDG - ASTM A653 Class G185 304/316 SS	304/316 SS	NA

Unlike Koppers Micropro, Lonza do not differentiate between surf coasts and non surf coast. They define coastal as within 8 km from the coast. Source: “Corrosion and hardware recommendations for treated wood” Arch Technical Note.

## Pryda

DISTANCE FROM COAST	CORROSION ENVIRONMENT FOR COASTAL AREAS <sup>(see note below)</sup>	
	OCEAN COAST (Subject to Breaking Surf)	SHELTERED BAYSIDE (Not subjected to Breaking Surf)
Up to 100m	SEVERE MARINE	SEVERE MARINE
100m to 1 km	SEVERE MARINE	MARINE
1 km to 10 km	MARINE	MODERATE
Greater than 10 km	MODERATE	MODERATE

**Table 1 – Corrosion Environments**

LOCATION	CORROSION PROTECTION REQUIREMENT FOR DIFFERENT ENVIRONMENT		
	SEVERE MARINE	MARINE	MODERATE
INTERNAL	Z275 or equivalent <sup>(1)</sup>	Z275 or equivalent	No Protection Required <sup>(4)</sup>
EXTERNAL <sup>(2)</sup>	Marine Grade 316 stainless steel or equivalent <sup>(2)</sup>	Marine Grade 316 stainless steel or equivalent <sup>(3)</sup>	Marine Grade 316 stainless steel or equivalent <sup>(3)</sup>

Pryda are even more restrictive in the use of stainless. Even if the use is more than 10 km from the coast, if the use is external e.g, a verandah, it must be stainless.

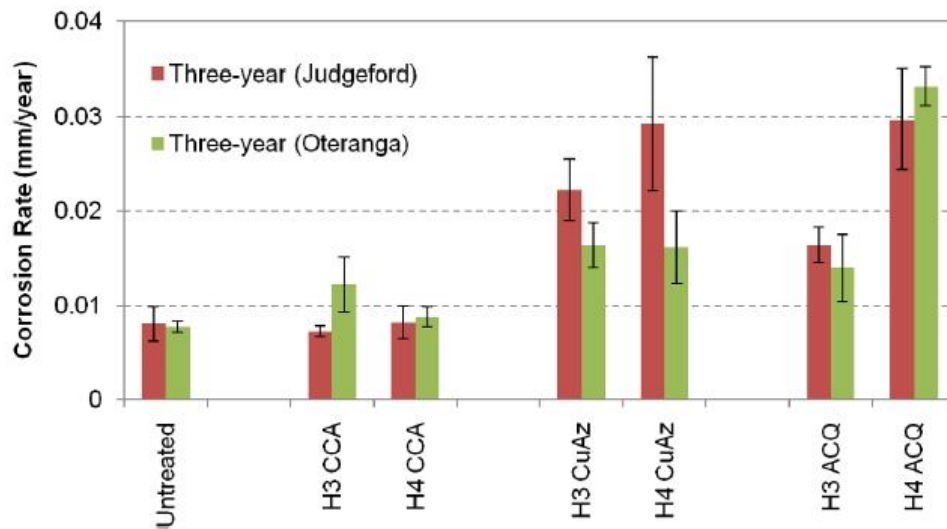
When I was researching this issue in my Timber Preservation Guide (have you purchased your copy yet, and why not if you haven't) I asked the recommendations of another timber treatment supplier. It was referred back to their lawyers in the US. That company refused to give a recommendation and referred me to the bolt manufacturers recommendations - which don't exist. So you could be excused for finding this a difficult area to answer definitively and the implications are very serious. So, what is the answer?



To the rescue comes our New Zealand brothers. They built a series of timber "structures" using a variety of preservatives and screw types and put them in two locations, one just metres from breaking ocean and the other was in what was considered a benign application. They left them there for years to determine what actually happened. There were enough of these units that they could dismantle them to check at corrosion at regular intervals. Their finding in part was:

- Corrosion rates derived from accelerated tests performed at high temperature and high humidity cannot be extrapolated to predict the service life of a specific component exposed to real service conditions
- Given that average corrosion rates of mild steel and zinc-coated items measured were commonly two to three times higher with ACQ or CuAz treated timbers over CCA if the timber gets wet, it is doubtful that hot dipped galvanised nails or mechanically plated screws will be able to meet the durability requirements of the NZBC and relevant New Zealand standards. The use of either AISI 304/316 grades of stainless steel, or durable equivalents such as silicone bronze, for structural components and connections in ACQ and CuAZ treated timbers (H3.2 and above) to meet the 50 year durability requirement would appear to be a sensible interim precaution.

Their real life findings are more in keeping with the recommendations of Lonza and Pryda. A surprising finding was that the shank of the fastener (as opposed to the head) often corroded more in the benign environment than close to breaking sea! The green bars in the graph below is the site close to the ocean. Contact me for a copy of this report.



**Figure 48:** Corrosion rates of hot dip galvanised nails measured after three years of exposure at Judgeford and Oteranga Bay

The practical implications of this are enormous. A boardwalk and deck should be built with stainless fasteners but if you price on stainless you wont get any work!! I know that from bitter experience. That was long before last month I complained about being beaten on price on a boardwalk where the builder only used galvanised triple grips! But as most of my readers are specifiers you have the power to say, "I will only accept stainless". For new products such as our prestige bollards we are only using stainless fasteners.

### [New CPD Session on Architectural Timber Battens](#)



There has been a surprising level of interest in my latest CPD subject, *Architectural Timber Battens*. Have you made a booking yet. You know you have to do CPD so why not avail yourself of a free subject?

Timber construction and durability in external application has always been my passion and In particular to see timber used In a fit for purpose application and last a lifetime In all its glory. I have written several books on external timber design and application over the years and presented as guest speaker at many Seminars including Timber Queensland's on the topic.

The free seminars have stopped for the time being, except for those already booked. The seminars usually taken up first are either the Seven Deadly Sins of Timber Design or Timber Decks - Designing for Durability (or both if you can make the time on the same day). These are serious seminars with [serious learning outcomes](#) and, if required for CPD points, they come with a test and a certificate. Call me on 0414770261 to arrange a suitable time for your personalised "Ted talk".

The full range of subjects I have available are:

***Timber Preservation.***

***Hardwood Grading.***

***Timber Decks – Designing for Durability,***

***Utilising Small Diameter Hardwood.***

***The Seven Deadly Sins of Timber Design.***

***Joints and***

***Architectural Timber Battens***

### [New Book Almost Complete](#)

My book on architectural timber battens is all but complete and is already at a useful stage if you need it. It will be \$33. **I still need a good image of a clear film finish breaking down, Can you help?**

### [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 2012 newsletter](#). Refer to it when assessing the suitability of quotes.

[Steel bridge Quotation Request Form](#)

[Timber Bridge Quotation Request Form](#)

#### **More information:**

If you have longer span timber road/rail/heritage bridge issues, we suggest you talk to Mr. Dan Tingley Cell: 04 5957 6314 or 04 28983328 E. [dant.tingley@gmail.com](mailto:dant.tingley@gmail.com)



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