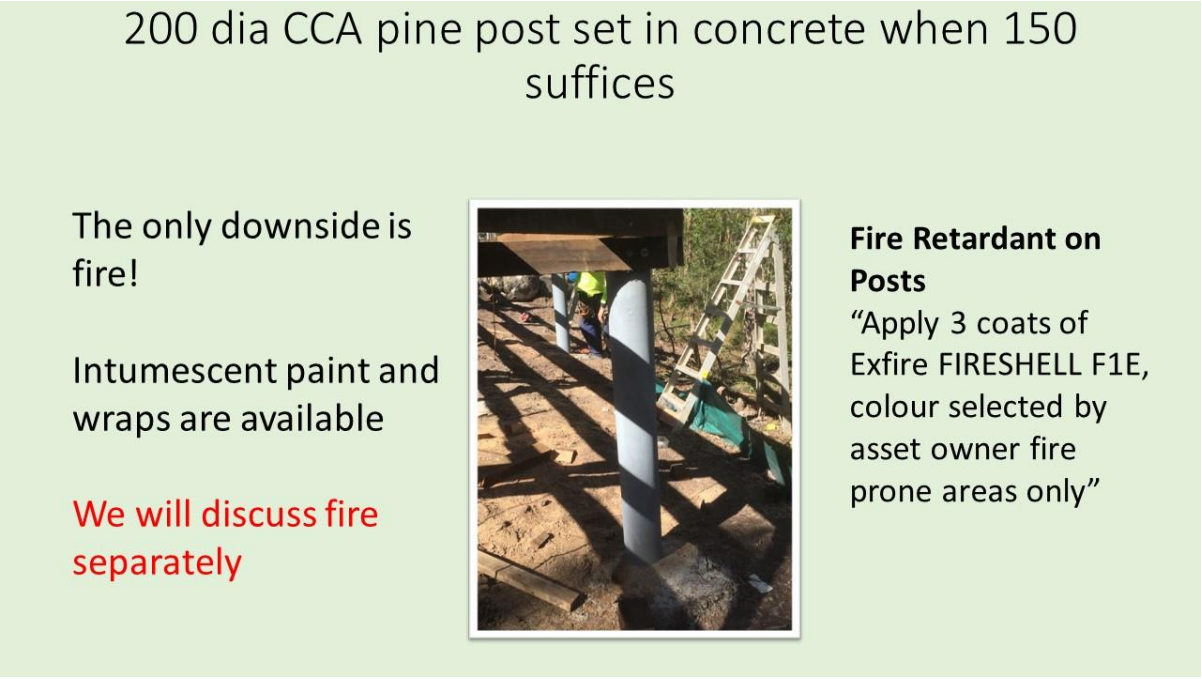
Ted's News
January 2020

A Lesson from the Recent Bushfires

The picture above shows damage to fencing on property our family sawmill once owned at Ravensbourne near Toowoomba. Over 30 years ago we fenced along the highway using split posts and barbed wire with natural rounds as strainers. Because we could, I treated the posts which all had had sapwood with CCA. Soon after installing a fire went through a portion of the fence line and the destruction in the posts was far worse than anything you would have expected. I asked my chemical supplier about this and was informed about "afterglow" in CCA treated timber. Basically, after the fire passed through, the chemicals in the CCA treatment caused the timber to

continue to burn. That wasn't in any of their literature that was provided to their treaters. A few weeks ago, another fire went through and the remainder of the fence was lost. The round posts with treated sapwood all around were burnt completely. Pity, as the posts were in excellent condition despite being over 30 years old.



This picture is a slide from my coastal decks course which you should be running (not one of my free ones though) and it is part of the discussion of fire in relation to foundations. The need to address fire with CCA was drawn from my first experience at Ravensbourne. While a 200 mm CCA post treated to H5 in this location has a 100-year design life as far as decay is concerned, it might only be three months if there is a fire. So, you should take fire into account where it is likely to be an issue. The details of how fire repellency was achieved is given on the slide.

Pre-war but Which War

Not a paid advertisement

When it comes to timber bridges, Australian thinking struggles to get past the "old rattlers" on country roads. When being replaced with timber or repaired the original plans drawn up before WW2 are used. Yet it would be fair to say that they were very similar to the plans used prior to WW1 or even the Boer War. All of them incorporated bad practice such as vertical bolts and designers obstinately refused to do what was necessary to vastly extend the life. The following article

provided by my friends at Wood Research and Development (WRD) and Timber Restoration Systems should bring the doubters with pre- (which) war thinking up to date with timber bridges. More importantly, this technology is available in Australia.

Watch a video of the bridge construction here

WRD and Timber Restoration Services (TRS) were commissioned to design and construct the Nappan Marsh Bridge, also commonly known as the Rainbow Bridge, that traverses the Nappan River in Nova Scotia, Canada. The prior structure which comprised a steel arch and timber pile substructure was decommissioned and dismantled in early 2019 due to structural integrity issues following 47 years of service. The bridge is located in the highest embedded and exposed corrosion zone in the country where steel simply doesn't have the longevity to match a timber structure. The old steel structure was built on timber piles which supported an old timber bridge the steel one replaced. Additional timber piles were added to the substructure when the steel bridge was built. The new bridge design incorporates the existing substructure timber piles (A COMBINATION OF 78 AND 47 YEARS OLD) and accommodates the vertical alignment and soffit height stipulated by Nova Scotia Transportation and Infrastructure Renewal (NSTIR). The 3-lane glulam bridge design includes two 12.5m girder under approach spans and a 40m 3 pinned arch middle span, Canada's longest clear span three lane design timber bridge. The existing

timber pile substructure, originally set to be removed, were incorporated into the CL-625 ONT load case design to support a 100-year design life glulam substructure, superstructure, kerb and guardrail system. The old timber piles will now stay in service for another 100 years beyond the 78 years the majority have already been in service for. Site preparation works commenced in June of 2019 in parallel with prefabrication works of the glulam elements. Substructure installation works commenced in mid-October and in December of 2019 the centre span was lifted into place. The bridge was open to traffic on 20 December 2019.

WRD's Australia division were heavily involved in the design and drafting of the Nappan Marsh Bridge replacement project. Once the design was approved and materials ordered, technicians from TRS (Australia) travelled to Oregon, USA where initial manufacturing took place and then on to Amherst, Nova Scotia to assist with the pre-assembly of the structure in a nearby warehouse and then on site to be ready to complete the final install. The Australian team assisted with staffing both shifts of the 24 hour round the clock program to ensure timely prefabrication of these major elements and to gain the experience of handling such large bridge components.

Collectively, Australian staff contributed to the bridge design, drafting, project management and construction phases of the project. TRS was praised by its client, Nova Scotia Transport and Infrastructure Renewal for including its engineers and in the construction teams to gain valuable experiences which will benefit their future careers.

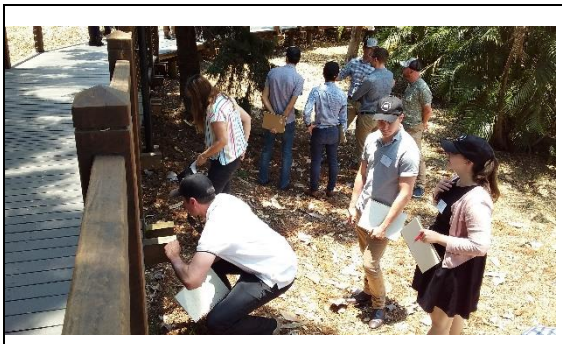
For more information please visit www.timberrs.com or contact Patrick Bigg on patrick.b@timberrestorationsystems.com.au

An OSA Boardwalk Used as a Teaching Aid.

Group Durability Exercise - Examination of one of my boardwalks

On the 9 & 10 December 2019, the Future Timber Hub at The University of Queensland held a 2-day continuing professional development course on integrated design of timber buildings where an old friend from TRADAC days, Geoff Stringer presented on timber durability. Other subjects were fire safety (expert Professor José Torero) and building physics (expert Samantha Anderson). The 16-

year-old Ferry Boardwalk we designed at UQ which was used as part of the workshop exercise. Click here for more images.



These require building

About the day Geoff said: “A number of the 30 attendees were well aware of your good work and your practical/positive approach to durability. I actively promoted your publications and websites and your role in the Ferry Boardwalk.

There was generally good support for pursuing regular inspections of structures and for load limit signage on decks, particularly given recent failures. The workshop also emphasised the need to get more serious about maintenance activities, i.e. formalised plans detailing inspection requirements, test requirements, potentially critical elements/joints within a structure, etc. Maybe there is a publication in this topic, i.e. "A maintenance guide for timber structures".

The other theme from my presentation was really the need to be more definitive on service life requirements. It's my belief that if we set "fuzzy" service life targets then we will get "fuzzy" performance. Clearer service life targets in the BCA, Australian Standards and project specifications will help us all focus on the required durability outcomes of timber structures. NZ BCA and CTIQ do this already with 5, 15 and 50 year target life requirements. But because of the uncertainties involved, no one wants to be pinned down on exactly how long a timber structure will last. Yet when it comes to structural performance, engineers regularly state that a structure will withstand very defined load conditions, i.e. a 50-year return wind speed, a live load of X, etc. We need this same confident approach from designers when it comes to durability performance and to do this we need a better durability system in place. Something we should all be working towards.

Thanks again Ted for your support and friendship over the last 35 years and for continuing to champion the durability of timber structures. We certainly need more leaders like yourself to step into this space."

In the future, the ARC Future Timber Hub is hoping to run more CPDs on other topics relating to integrated design such as design of timber connections and acoustics. We

recommend you visit the ARC Future Timber Hub website and follow their LinkedIn and/or Facebook pages for more information

Full Day Courses

I have been collecting images and case studies of good and bad practice for over 20 years and learning from those images. I now have an unmatched library of do's and don'ts of external timber use. This vast collection of images allow me to clearly explain design issues in my two full day courses, one deals with footbridges and the other with coastal decks. These are incredible resources going into the close attention to detail that is required for a weather exposed timber bridge or deck to succeed.

These are serious courses that are unmatched in the value you will extract from them by delivering expensive infrastructure that ages gracefully and with little maintenance. They both start by going through a design checklist and explaining, line by line, why you must attend to that point. They then look at a number of case studies, showing good and bad practice.

Click here for footbridge course brochure
Click here for coastal decks brochure

Call me to discuss you training needs. These courses, which are eligible for CPD points, will give you an incredible understanding of good timber use from them. Call 0414 770 261 or email me.

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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