



Outdoor Structures Australia

Practical solutions that enhance community design projects

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EXTERNAL TIMBER DESIGN NOTE

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Careful attention should be given when using the word *sleepers* in engineering and landscaping design as the designer's expectation seldom match what is received which can lead to structural issues and aesthetic problems.

For over 100 years, when railway sleepers were replaced they were simply stacked by the side of the line and burnt. While the sleepers had passed their use by date for their original purpose many were still sound enough to be used in structural landscaping applications such as retaining walls. It has been common practice for some time now for sleepers that have been withdrawn from service to make their way into the landscaping industry.

Railway sleepers are produced from a limited range of species that have been proven to work well in fully weather exposed situations. They are not treated and the sapwood soon decays. In Queensland the standard size for a railway sleeper is 7ft long 9 inches wide 4.5 inches thick (Queensland Rail, it appears are still imperial) and weigh 67kg. Every sleeper is inspected before acceptance for compliance against a tight quality specification and annually thereafter over their service life of 20 years.

The quantity of used railway sleeper did not meet the needs of the landscaping industry and soon sawmills started producing a timber product at about 50% the cost of the comparable size structural hardwood which they called *sleepers*. These were generally 200x50, 200x75 and 200x100 and available in 2.4m lengths. The only way that the timber could be produced so inexpensively was not to have any meaningful quality specifications as:

- Timber would be cut with the heart (pith) fully in the centre or at the edge whereas heart is not allowed in structural timber under 175x175. Included heart results in timber that has no known structural value so as to allow engineering design. The deterioration around the heart is dramatic as both images on this page show.
- In many mills there was little selection of species as to suitability and little grading of natural defect. A general grading was *one reasonable face and edge*.
- These "sleepers" contained very little sapwood yet were treated and stamped with the H4 or H5 brand. A practice that is only valid on hardwood which is durability class 1 in ground.

Unfortunately, these low grade products without any known properties are being used in structural applications such as retaining walls where the specification is critical. They are also being used as non structural public landscaping but where long term appearance is required. We have seen footbridges designed by engineers with 200x50 sleepers as the only specification for decking and we have also seen bridges where this grade has been used! We have also seen drawings from landscape architects where the only timber specification is "sleepers".





This sleeper wall used timber of low quality which is deterioration quickly. One whaler has already been replaced. This retaining wall would not have been designed using this grade of timber. The sleepers would have been supplied on the basis of price, not specification

The post has not been supplied to an adequate durability specification, probably compounded by setting the post in concrete – something you should not do with hardwood. No fines concrete is acceptable though.



The bollard to the left is free of heart but has a very

large unsound knot which is visually unacceptable in public landscaping. The bollard on the right has split in two because it was cut with the heart in. The nail plate on the tops of these bollards which are intended to restrain future degrade will, in time, work their way out of the end grain and endanger the public with their sharp corners. Both these bollards were specified as OSA products which are performance driven and replaced with sleepers on the basis of price.



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