

*Glass barriers – care needed to achieve safety and durability continued*

Other glass design issues to consider include the following.

- Mounting brackets need to provide for adjustment so that stresses are not set up in the glass by the installation procedure.
- The different temperature expansion coefficients of glass and metal supports also need to be considered and allowed for, as well as differential movement in the building structure. Aluminium expands about three times as much as glass for the same temperature change.
- When panels are unframed, standard toughened glass can sometimes fail spontaneously due to fault inclusions within the glass. The use of 'heat soaked' toughened glass for these applications reduces the chances of spontaneous failure.
- The installation processes itself must not harm the glass by introducing unintended stresses, cracks or chipping the edges of panels.
- Holes in the panels for fixing brackets must be positioned according to the manufacturer's specified spacing and edge distances. Creation of the hole must not introduce local weakness in the glass.
- Gaskets or bushes should be used between fixing brackets and the glass to reduce local stresses in the glass.

## Determinations issued

*Determinations that have considered the use of macrocarpa or cypress timbers in buildings.*

### INTRODUCTION

The Department (and its predecessor, the Building Industry Authority (BIA)) has issued six determinations about the use of macrocarpa or cypress timbers in buildings. In all six cases, the question was whether these timbers, as installed, complied with Building Code Clause B2 Durability.

Other factors that were common to all the determinations were that:

- it was accepted that compliance with Clause B1 Structure had been achieved
- the buildings were less than five years old
- the relevant timbers were exposed to the weather.

### DETERMINATION NO 2004/10: DURABILITY OF UNTREATED TIMBER VERANDA POSTS

The members in this instance were 125 mm x 125 mm macrocarpa posts that supported a veranda roof, and which were fixed to brackets so they could be readily replaced. No information was supplied to establish whether the posts were heart or sap timber. The BIA found that the posts had to have a durability of at least 50 years according to Clause B2.3.1 (a)(i). It also found that posts exposed to exterior weather conditions and dampness, but not in contact with the ground, must be equivalent to structural-grade radiata pine treated to Hazard Class H3.2. This is the requirement set out in Acceptable Solution B2/AS1. The BIA decided that the posts did not meet either of these criteria, and therefore determined that they did not comply with Building Code Clause B2.

**DETERMINATION NO 2004/71:  
HEART MACROCARPA  
VERANDA POSTS**

This determination concerned 200 mm x 200 mm macrocarpa posts that supported either the balconies or the roofs of five apartment buildings. The posts were of heart timber, were not in contact with the ground, and their cut ends were painted with a copper naphthenate preservative. The BIA commissioned a report from an expert in the preservative treatment of timber on the durability of the posts in question. The report concluded that the posts had the equivalent durability to that conferred to radiata pine by preservative treatment to Hazard Class H3. Accordingly, the BIA determined that the posts complied with Building Code Clause B2.

**DETERMINATION NO 2007/97:  
EXPOSED HEART  
MACROCARPA POSTS AND  
BEAMS TO A HOUSE**

In this instance, the members in question were posts supporting upper decks, 300 mm x 200 mm primary portal members, and 200 mm x 150 mm portal struts and beams. All the members were heart macrocarpa finished with a clear preservative, and all the exposed end-grains were protected by metal cappings. The Department noted that, while some members were exposed to high winds, this could help in removing debris that would otherwise trap moisture. Considering an expert's report, the timber treatment, the over-sized portal members, and the end-grain protection, the Department determined that the exposed posts and portals complied with Building Code Clause B2.

**DETERMINATION NO 2007/99:  
CODE COMPLIANCE OF  
MACROCARPA POSTS AND  
RAFTERS INSTALLED IN A  
HOUSE**

The dressed macrocarpa members in this instance were six oval cross-section 150 mm x 100 mm laminated columns supporting a deck roof, and 185 mm x 45 mm or 185 mm x 70 mm projecting roof members. All the timbers in question were protectively coated. None of the timber elements were in contact with the ground, and the columns could easily be replaced. While it was established that the rafters were constructed in heart timber, no information was provided to show that the columns were also heart macrocarpa. The Department determined that, once the territorial authority was satisfied that the posts and rafters were compliant with Clause B2 (which it was to do by using criteria from Determination 2004/71), the territorial authority should issue a code compliance certificate.

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### **DETERMINATION NO 2007/129: THE DURABILITY OF LAWSON CYPRESS POSTS AND BEAMS TO A COTTAGE**

This determination related to heart Lawson cypress posts supporting roofs or verandas, together with rafters and roof beams. The posts were secured to metal brackets, and the end grains were protected by copper cappings. It was accepted that heart Lawson cypress timber has similar properties to heart macrocarpa. However, as in this case the timber as installed lacked a surface preservative, it did not meet the durability required by NZS 3602. In addition, there was insufficient drainage at the junctions of the posts and bearers. The Department determined that, once a preservative had been applied to the end-grain and surfaces exposed to the elements, and ventilation between posts and bearer had been improved to the territorial authority's satisfaction, a code compliance certificate could be issued.


### **DETERMINATION NO 2007/129: HEART MACROCARPA POSTS AND DECKING TO A HOUSE**

The building elements that were subject to this determination related to an amended building consent and consisted of Mexican cypress 150 mm x 150 mm deck support posts, 19 mm thick decking, and 100 mm x 100 mm balustrade posts. The decking and posts were easy to replace, but the columns could only be replaced with a moderate amount of difficulty. While the majority of the timber was heart wood, there was evidence of sapwood present in the balustrade posts and decking. The cut ends of the columns and beams were treated with a preservative containing copper naphthenate, and the tops of the columns were fitted with copper caps. It was accepted that heart Mexican cypress timber has similar properties to heart macrocarpa. However, as in this case the balustrade posts lacked a surface preservative or cappings, they did not meet the durability required by Clause B2. In addition, the columns required to be treated with preservative and painted for protection. The Department determined that, while the decking was Code-compliant, both the columns and posts had to be treated as described before they would be Code-compliant.

### **SUMMARY**

The six determinations have established certain criteria to decide whether macrocarpa, or Lawson or Mexican cypress timbers, are Code-compliant when installed to the exterior of buildings. Such timbers are the equivalent to structural-grade radiata pine treated to Hazard Class H3.2, and therefore comply with Clause B2 of the Building Code if:

- they are heart timbers
- they are not in contact with the ground
- they are relatively easy to replace
- their surfaces are treated with an appropriate preservative
- their cut ends are similarly treated or suitably capped
- they have a durability of at least 50 years according to Clause B2.3.1 (a)(i).

**To read all the determinations  
in summary or in full, go to:**  
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determinations](http://www.dbh.govt.nz/determinations)