Department of Building and Housing
Te Tari Kaupapa Whare

Determination 2011/008

Refusal to issue a code compliance certificate for a 9-year-old house with macrocarpa posts and beams at 16 Oak Tree Lane, Rolleston

1. The matters to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[1] ("the Act") made under due authorisation by me, John Gardiner, Manager Determinations, Department of Building and Housing ("the Department"), for and on behalf of the Chief Executive of that Department. The applicants are the owners K and J Shearer ("the applicants"), and the other party is Selwyn District Council ("the authority"), carrying out its duties as a territorial authority or building consent authority.

1.2 This determination arises from the authority's decision to refuse to issue a code compliance certificate for a 9-year-old house, because it is not satisfied that the building work complies with certain clauses[2] of the Building Code (First Schedule, Building Regulations 1992). The authority's primary concerns about the compliance of the house relate to its age and to the durability of its verandah posts and beams.

1.3 The matter to be determined[3] is therefore whether the authority was correct to refuse to issue a code compliance certificate. In deciding this, I must consider:

[1] The Building Act 2004, Building Code, compliance documents, past determinations and guidance documents issued by the Department are all available at www.dbh.govt.nz or by contacting the Department on 0800 242 243.
[2] Unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.
[3] Under section 177(2)(d) of the Act

1.3.1 Matter 1: The verandah and framing timbers

Whether the exposed timbers of the posts, rafters and beams to the verandahs ("the verandah timbers") comply with clause B2 "Durability" of the Building Code. By "the verandah timbers" I mean the components (such as the posts, the beams, the rafters and the junctions) as well as the type of timber used and the location of the exposed timbers in this house. The framing timber at external corners of the house (refer paragraph 4.2) is also included in this matter. I consider this matter in paragraph 6.

1.3.2 Matter 2: The shower waterproofing

Whether the tiled shower to the house complies with Clause E3 Internal Moisture of the Building Code and clause B2 insofar as it relates to Clause E3. I consider this matter in paragraph 7.

1.3.3 Matter 3: The durability considerations

Whether the building elements comply with Clause B2 Durability of the Building Code, taking into account the age of the house. (I consider this in paragraph 8.)

1.4 In making my decisions, I have considered the submissions of the parties, the report of the expert commissioned by the Department to advise on this dispute ("the expert"), and other evidence in this matter.

2. The building work

2.1 The building work consists of a detached house situated on a level site, which is in a high wind zone for the purposes of NZS 3604[4]. The construction of the house is conventional light timber frame, with a concrete slab and foundations, fibre-cement weatherboard cladding and aluminium joinery.

2.2 The house is fairly complex in plan and form, with 30^{o} pitch profile metal gable roofs over central areas and 14^{o} lean-to roofs to the south elevation that extend as a gable over the garage. On the north and west elevations, low pitched lean-to roofs form verandahs.

2.3 The verandahs

2.3.1 The house has three verandahs. On the north elevation, the living area extends as a gable from the main roof to form a central bay, with verandahs to both sides. The verandah to the east of the bay extends past two bedrooms, while the other extends around the northwest corner to finish at the rear door of the garage. A third verandah is formed at the recessed main entry to the south.

2.3.2 The verandah roofs are supported on rough sawn timber posts and beams, with posts supported on galvanized steel brackets set into concrete pads. Ground level timber decks form floors to the verandahs, with the spaced timber slats cut around the posts just above the level of the concrete pads.

2.3.3 The posts are rebated and bolted to the inside of the verandah support beams, with rafters fixed to posts and beams as shown in the following sketch:

[4] New Zealand Standard NZS 3604:1999 Timber Framed Buildings

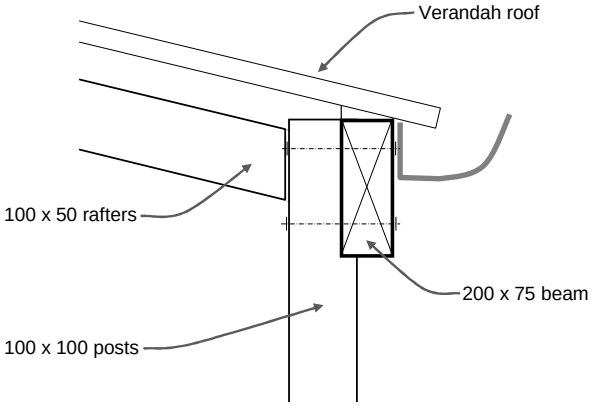

Figure 1: Post and beam junction

2.4 The verandah timbers

2.4.1 The specification calls for timber to comply with B2/AS1, which provides NZS 3602[5] as an acceptable solution for meeting the durability requirements of timber used in the building. No specific timber type is specified.

2.4.2 The timber retailer's invoice dated 27 July 2001 indicates that the verandah timbers supplied were Macrocarpa. In a letter dated 5 March 2005, the timber provider confirmed that it supplied the retailer with Macrocarpa and noted that the 100mm x 100mm posts would have been cut from 'the inner part of the log away from sapwood' and would therefore be 'a minimum of 95% heartwood'. Based on his investigations (see paragraph 5.3.2), the expert considered that the verandah posts and beams were heartwood. Given this evidence, I accept that the verandah timbers are likely to be heartwood Macrocarpa.

3. Background

3.1 The authority issued a building consent to the former owners for the house (No. 010364) on 17 April 2001 under the Building Act 1991.

3.2 The authority carried out various inspections during construction in 2001. Although I have not seen the inspection records, the applicants have stated that the house was constructed in 2001 and the date of the timber invoice (see paragraph 2.4.2) supports that. However a final inspection was not called for until early 2005.

3.3 The 2005 final inspection

3.3.1 The authority carried out a final inspection on 25 January 2005 and the inspection record identified nine outstanding items. In a letter to the former owners dated 7 February 2005, the authority noted there were 'some outstanding issues to be resolved before the Code Compliance Certificate can be issued.'

[5] New Zealand Standard NZS 3602:2003 Timber and wood-based products for use in building

3.3.2 The authority made no comment about the shower waterproofing, but noted (in item 3) that one bathroom was 'yet to be completed'. In regard to the verandah timbers, the authority stated (in item 1):

> Verandah posts and beams appear to be untreated macrocarpa timber. Provide either proof of the type of treatment used or confirm that the timber used is heartwood not sapwood. Sapwood requires H3 treatment when used in those positions on a building.

3.4 The former owners subsequently forwarded the timber retailer's invoice and the timber supplier's statement as outlined in paragraph 2.4.2. However, a further inspection was not carried out until the house was sold to the applicants in 2007.

3.5 The authority re-inspected the house on 14 June 2007 and identified three outstanding items.

- Verandah posts now stained, unable to determine timber treatment…
- Gas and electrical certificates required (Not related to the determination)
- Provide council with verification that a tanking membrane has been applied to tiling in shower.

3.6 In regard to the matters to be determined, apart from repeating the item about the verandah timbers the authority had added the item about the tiled shower (presumably related to the uncompleted bathroom noted in the final inspection). The inspection records include these as items (1) and (3).

3.7 The authority's decision

3.7.1 In a letter to the applicants dated 21 September 2007, the authority stated that it was unable to issue a code compliance certificate for the building work due to 'the time which has elapsed since the building consent was granted'; explaining how the durability requirements of the Building Code commenced from the time of issue of the code compliance certificate and therefore it could not:

> ...now be satisfied on reasonable grounds that the building work and elements will continue to satisfy the durability provisions of the Building Code for the prescribed period after the Code Compliance Certificate has been issued.

3.7.2 In addition, the authority noted that the following remained unresolved:

1. Satisfactory verification that a tanking membrane has been applied to the shower walls prior to the tiles being installed as requested by inspection notice dated 14/6/07.
2. Satisfactory confirmation that the Macrocarpa verandah posts and beams are heartwood as requested by inspection notices 25/1/05 and 14/6/07.

3.7.3 In a statement dated 13 November 2007, the tiler stated that the tiling had been carried out in accordance with BRANZ recommendations and specified the particular liquid applied membrane products used.

3.8 The Department received an application for a determination on 28 October 2010.

4. The submissions

4.1 The applicants provided copies of:

- the letter from the timber supplier dated 5 March 2005
- the statement from the tiler dated 13 November 2007
- the re-inspection record dated 14 June 2007
- the letter from the authority dated 21 September 2007.

4.2 In a letter to the Department dated 15 November 2010, the authority outlined the history of the project. The authority gave its reasons for refusing to issue a code compliance certificate, noting that:

> The documents that purported to verify confirmation regarding the shower tanking and verandah posts/beams do not provide sufficient information to be satisfied on reasonable grounds that the work complies with the Building Code.

In addition, the authority said that:

> Moisture may have entered and damaged hidden elements within the walls during the time that had elapsed between the inspector noting that the … cladding was not installed in accordance with the manufacturers specifications (25 January 2005), and when the inspector confirmed that this work had been corrected (14 June 2007).

4.3 The authority provided copies of:

- the consent drawings and specification
- the building consent
- the records of the final inspection and the re-inspection
- the letter to the former owner dated 7 February 2005.

4.4 A draft determination was issued to the parties on 14 December 2010. The draft was issued for comment and for the parties to agree a date when the house complied with Building Code Clause B2 Durability. The applicant accepted the draft without comment and the parties agreed that compliance with Clause B2 was achieved on 1 January 2002.

4.5 The authority did not accept the draft. In a submission to the Department dated 17 January 2011 the authority noted the following:

- The tiled shower was required to comply with Clause B2 in addition to E3. The authority did not believe reasonable ground existed for it to be satisfied that the shower membrane was code compliant.
- The possible damage to the corner framing was raised 'for greater clarification to support the refusal [to issue] the code compliance certificates in regards to the durability provisions of the Building Code' and was part of the authority's 'peer reviewing code compliance certificates prior to issue'.
- The PIM noted the building was in a high wind zone.
- Figure 1 was not fully representative of the as-built work.

- The authority only received the statement from the tiler referred to in paragraph 3.7.3 at the time the application for determination was made.
- Heart Macrocarpa was outside the scope of NZS 3602 and was not mentioned in Table 1 of that standard. The posts and beams were required to be durable for not less than 50 years.

4.6 I have considered the authority's submission and amended the determination as appropriate. In response to matters raised by the authority I note that:

- The authority made a submission in response to the application for a determination, which assists in clarifying the matter in dispute and which I welcome. However, the submission noted that moisture 'may' have entered the cladding arising from faults noted in January 2005, but an inspection carried out in June 2007 noted the work had been successfully completed. I do not accept that the application for determination, of itself, provides grounds for an authority to review its earlier decisions and that the Department should then consider it solely on the grounds that compliance 'may' not have been achieved.
- The durability of macrocarpa has been considered in previous determinations, in particular Determination 207/99, which found that, subject to what would be considered normal maintenance (refer paragraph 6.4.3) Heart Macrocarpa had a 50-year durability life equivalent to H3.2.
- Table 1 of NZS 2304 describes the durability of Cyprus species timber. The notes to Table 1 list Macrocarpa as a Cyprus species.

5. The expert's report

5.1 As mentioned in paragraph 1.4, I engaged an independent expert to assist me. The expert is a member of the New Zealand Institute of Building Surveyors. The expert inspected the verandahs and the tiled shower on 23 November 2010 and provided a report on 25 November 2010. He subsequently inspected fraying timber under the Linea weatherboards at the external corners on 11 November and provided an addendum report on 13 November 2010.

5.2 The expert noted that the house generally accorded with the consent drawings. The expert also noted that the overall construction quality appeared to be very good, with the house 'extremely well maintained' to an 'impressive standard and has a general appearance of property of a lesser age'.

5.3 The verandah and framing timbers

5.3.1 The expert noted that the verandah timbers appeared in 'excellent' condition, with the posts 'straight and well aligned' and spliced and mitre joints in the beams 'tight and well formed'. The expert also noted that the posts and beams were stained with what appeared to be 'a good quality oil-based stain'.

5.3.2 The expert removed a small sample of timber from across the top of a verandah post in order to examine the cross-section of the wood. He observed 'tight annular rings' that had a diameter of about 160mm, which indicated the post had been cut from the

heartwood section of the log. I accept that the wood in this sample is typical of the other verandah posts installed to this house.

5.3.3 The expert noted his inspection had followed heavy southerly rain the previous day and took invasive moisture readings into the base of all verandah posts; recording readings from 8% to 12%; indicating moisture had not penetrated into the timber.

5.3.4 Commenting specifically on the verandah timbers, the expert noted that:

- the timber is finished with an oil-based stain which is well maintained
- the posts are rebated and bolted to the verandah support beam at the top; and are raised above ground level and bolted to metal brackets at the bottom
- the end grain of the post top is fully protected against moisture penetration by the outer beam and the verandah roof
- due to the bolted connections, individual posts are clear of the ground and could be easily replaced without 'structural interference to the surround areas'
- rafters butt against the outer beam and posts, protecting the end grain
- there is no sign of deterioration to any part of the timbers after nine years.

5.3.5 Based on his investigations, the expert considered that:

> ...the Macrocarpa timbers used to construct the verandah posts and beams is Heart Grade Timber and has performed under NZBC B2 as an alternative solution; and providing regular normal maintenance is carried out in accordance with NZBC B2 Durability Clause B2.3.1 should continue to do so.

5.3.6 The experts report showed there were no signs of any damage having occurred in the framing at the external corners and they would continue to meet the durability requirements of the Building Code

5.4 The tiled shower

5.4.1 The expert noted that the shower tiling appeared to be 'good quality and a professional job'. After some years 'the tiled area is clean and the grout is in good condition', with 'no obvious evidence of internal joint cracking or fungal growth'.

5.4.2 The expert noted that there were no details on the shower construction in the drawings, but the tiler's statement confirming the waterproofing (see paragraph 3.7.3) was from a local 'respected tiling contractor'. The expert visually inspected the shower and surrounding walls, noting no evidence of moisture problems.

5.4.3 The expert removed a small section of lining from the hallway wall directly behind the internal corner of the shower cubicle. The timber was visible and invasive moisture readings were taken in the bottom plate, corner stud and the plaster board lining behind the tiles. All readings were below 13%, indicating that the waterproofing was preventing moisture penetration into the underlying substrate and framing.

5.4.4 Based on his investigations, the expert considered that the tiled shower complied with Clause E3 of the Building Code.

5.5 A copy of the expert's report was provided to the parties on 26 November 2010 and an addendum report provided to the parties on 14 November 2010. The authority commented on reports with its submission on the draft determination, refer paragraph 4.5.

Matter 1: The verandah and framing timbers

6. Evaluation for code compliance

6.1 The evaluation of exposed timbers for compliance with the Building Code and the risk characteristics considered in regards to durability of the timbers have been described in previous determinations (for example, Determination 2007/129).

6.2 Durability risk

6.2.1 In relation to the risk characteristics that are likely to influence the durability of these verandah timbers, I note the following:

Construction features:

- the house is located in a medium wind zone
- the exposed timbers are visible and accessible
- rafters, beams and tops of the posts are protected from the weather by the roof overhang of the verandah
- the bottom of the posts have a low level of exposure to the weather but are able to be replaced if necessary
- verandah posts are bolt fixed to beams at the top and fixed to brackets at the bottom, which are above the ground, and surrounded by a free-draining deck

The use of the timber:

- the timber is well ventilated and able to dry out if it becomes wet.
- the end grain of the roof timbers is protected against moisture
- the bolt connections allow the posts to be readily replaced if necessary

The durability of this timber species:

- Heart Macrocarpa is a moderately durable timber and is the equivalent of Pinus Radiata treated to H3.1, according to table 1 of NZS 3602.

6.2.2 Taking account of the features listed above, I consider that the exposed timbers to the verandahs of this house demonstrate a low durability risk.

6.3 Durability performance

6.3.1 I consider that the following factors compensate for the decreased treatment to the verandah timbers in this house from that specified in NZS 3602:

- The verandah timbers are well maintained and in good condition, with no signs of deterioration after more than nine years.
- The low moisture readings in the base of the posts following heavy rain indicate that the stain finish is limiting moisture absorption into the timber.
- The exposure of the timber to sun and wind assists in their drying.
- The end grain of the verandah members is protected from moisture absorption.
- The rafters, beams and tops of posts are sheltered beneath the verandah roofs.
- The timbers are visible and accessible for regular inspections and maintenance.
- The bolt fixings allow individual posts to be replaced if necessary.

6.4 Durability conclusion

6.4.1 Taking account of the expert's report , I consider the durability of the heart Macrocarpa timber used for the verandah posts, beams and rafters to this house is adequate to achieve the durability requirements of Clause B2 of the Building Code.

6.4.2 I emphasise that each determination is conducted on a case-by-case basis. Accordingly, the fact that particular timber elements have been established as being code compliant in relation to a particular building does not necessarily mean that the same timber elements will be code compliant in another situation.

6.4.3 I take the view that normal maintenance is that work generally recognised as necessary to achieve the expected durability for a given building element. With respect to the exposed verandah timbers used in this house, normal maintenance tasks should include but not be limited to:

- regular inspection of the exposed timber for signs of deterioration
- regular cleaning and removal of any debris trapped at junctions
- regular re-coating of the posts and beams to limit moisture absorption.

Matter 2: The shower waterproofing

7. Discussion

7.1 Taking account of the expert's report, I consider there are reasonable grounds to conclude that the tiled shower complies with Clauses B2 and E3 and of the Building Code.

Matter 3: The durability considerations

8. Discussion

8.1 The authority also has concerns regarding the durability, and hence the compliance with the building code, of certain elements of the building work taking into consideration the age of the house.

8.2 The relevant provision of Clause B2 of the Building Code requires that building elements must, with only normal maintenance, continue to satisfy the performance requirements of the Building Code for certain periods ("durability periods") "from the time of issue of the applicable code compliance certificate" (Clause B2.3.1).

8.3 These durability periods are:

- 5 years if the building elements are easy to access and replace, and failure of those elements would be easily detected during the normal use of the building
- 15 years if building elements are moderately difficult to access or replace, or failure of those elements would go undetected during normal use of the building, but would be easily detected during normal maintenance
- the life of the building, being not less than 50 years, if the building elements provide structural stability to the building, or are difficult to access or replace, or failure of those elements would go undetected during both normal use and maintenance.

8.4 In this case the delay between the completion of the house and the request for a code compliance certificate has raised concerns that various elements of the house are now well through or beyond their required durability periods, and would no longer comply with Clause B2 if a code compliance certificate were to be issued effective from today's date. I have not been provided with any evidence that the authority did not accept that those elements complied with Clause B2 at a date in 2001.

8.5 It is not disputed, and I am therefore satisfied, that all the building elements complied with Clause B2 on 1 January 2002. This date has been agreed between the parties, refer paragraph 4.4.

8.6 In order to address these durability issues when they were raised in previous determinations, I sought and received clarification of general legal advice about waivers and modifications. That clarification, and the legal framework and procedures based on the clarification, is described in previous determinations (for example, Determination 2006/85). I have used that advice to evaluate the durability issues raised in this determination.

8.7 I continue to hold that view, and therefore conclude that:

(a) the authority has the power to grant an appropriate modification of Clause B2 in respect of all the building elements if requested by the owner.

(b) it is reasonable to grant such a modification, with appropriate notification, as in practical terms the building is no different from what it would have been if a code compliance certificate for the building work had been issued in 2001.

8.8 I strongly suggest that the authority record this determination and any modifications resulting from it, on the property file and also on any LIM issued concerning this property.

9. The decision

9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that:

- the verandah and framing timbers comply with Clauses B2 of the Building Code
- the tiled shower complies with the Clause B2 and E3 of the Building Code

and accordingly, I reverse the authority's decision to refuse to issue a code compliance certificate.

9.2 I also determine that:

(a) all the building elements installed in the house complied with Clause B2 on 1 January 2002.

(b) the building consent is hereby modified as follows:

> The building consent is subject to a modification to the Building Code to the effect that, Clause B2.3.1 applies from 1 January 2002 instead of from the time of issue of the code compliance certificate for all the building elements.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 7 February 2011.

John Gardiner
Manager Determinations