



Determination 2018/030

Regarding the compliance of Lawson Cypress posts to a portico roof at 19 Royal Ascot Drive, Papamoa Beach, Papamoa



Summary

This determination considers the compliance of untreated Lawson Cypress posts with Clause B2 Durability. The determination considers whether the authority was correct in its proposed refusal to issue the code compliance certificate because the posts were untreated.

1. The matter to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the Act”) made under due authorisation by me, Katie Gordon, Manager Determinations, Ministry of Business, Innovation and Employment (“the Ministry”), for and on behalf of the Chief Executive of the Ministry.

1.2 The parties are:

- the owners, B Bunyard and S Herbert (“the owners”) who applied for this determination via an architect who is acting as their agent (“the agent”)
- Tauranga City Council carrying out its duties and functions as a territorial authority or building consent authority (“the authority”).

1.3 I consider the builder, Asset Homes New Zealand Ltd (“the builder”), is a person with an interest in the matter.

1.4 This determination arises from the authority’s proposed refusal to issue a code compliance certificate. The authority is not satisfied the posts supporting the portico

¹ The Building Act, Building Code, compliance documents, past determinations and guidance documents issued by the Ministry are all available at www.building.govt.nz or by contacting the Ministry on 0800 242 243.

roof comply with Clause B2 Durability² of the Building Code (First Schedule, Building Regulations 1992).

1.5 The matters to be determined³ are:

- whether the as-built support posts to the portico comply with Clause B2 Durability of the Building Code, and
- the authority's proposed exercise of its powers of decision in refusing to issue a code compliance certificate.

1.6 In making my decision, I have considered the submissions of the parties in this matter. I have not considered any other aspect of the Act or of the Building Code, nor have I considered any building elements other than the supporting posts to the portico.

2. The building work and background

2.1 The building work involves the construction of a new house with an entry portico. The entry portico is a roof that extends over a timber deck, and is supported by three timber posts.

2.2 These portico support posts are Lawson Cypress 250mm square posts. The timber supplier has confirmed the timber posts were 'heart Lawson Cypress to the NZS3602^[4] grade'. Each post is supported by a stainless steel bracket embedded into a concrete footing. Two M12 bolts run through each post to connect it to the bracket. A third bolt runs through each post on the adjacent faces. The base of the posts is approximately 190mm above ground level (110mm from the concrete footing to the base of the post).

2.3 The deck consists of a timber structure and decking, and sits close to the ground. The timber joists appear to abut the base of the posts, with no gap apparent. Based on the photographs supplied, the timber decking is laid with a small gap present around the posts.

2.4 A code compliance certificate application was submitted to the authority (which I have not seen). The authority then carried out a final inspection on 14 March 2017, which failed for a variety of reasons. In regard to the posts, the inspection record noted "3 timer (*sic*) posts to front entry splitting on bolts needs addressing".

2.5 On 21 August 2017, the authority wrote to the agent stating the durability period (Clause B2.3.1(a)) for the posts is 50 years, and the authority did not consider the posts would be easily replaced. The authority noted Lawson Cypress is outside the scope of NZS3602 for use as a post with a 50 year durability period. The authority was not aware of any supporting documentation that would support its use as an exposed structural post.

2.6 On 5 September 2017 the engineer wrote to the authority regarding the posts, noting although the posts were not treated to H3.2⁵ as specified on the approved building consent documents, in the engineer's opinion the posts were acceptable without

² In this determination, 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 sections 177(1)(a), 177(1)(b) and 177(2)(d) of the Act.

⁴ New Zealand Standard NZS 3602: Timber and wood-based products for use in building.

⁵ H3.2 refers to a level of timber preservative treatment.

timber treatment. The engineer set out the reasons for which he had formed this view as follows (in summary):

- The posts will not trap water as they are supported off the ground, therefore there will be no continuous wetting and “decay cannot occur”.
- NZS3604:2011⁶ requires a post of only 90mm square. Because the posts are 250mm a large amount of decay would need to occur before the structural integrity was compromised.
- Any decay of the posts would be easily detected during normal use, and the relevant durability period (Clause B2.3.1(c)) is 5 years. Should decay occur the posts would be easily replaced by propping the exterior roof, removing and replacing the posts.

2.7 In an email dated 2 November 2017, the engineer disputed the authority’s view regarding whether the posts could be easily replaced. The engineer noted this would involve the removal of part of the soffit, propping up the roof, removal and replacement of the post, and reinstatement of the soffit. Based on this, the engineer was satisfied the posts could be easily replaced and reiterated his view that as failure would be easily detected in normal use, the correct durability period was 5 years.

2.8 The authority responded to the engineer on 3 November 2017, stating it maintained the view that the posts were providing structural stability and therefore had a durability period of 50 years. An officer of the authority noted:

Whilst I agree that the posts are generously oversized to allow for some degrading, I don’t consider that this would be uniform over the length of the post, it would be more likely accelerated at the base area that has exposed end grain & limited ability to dry due to the low lying deck.

2.9 The authority referred to a number of previous determinations⁷ that considered the use of Lawson Cypress, but maintained the view it had not been provided with sufficient information to establish the posts as constructed comply with Clause B2. The authority also advised the inspecting officer had ‘viewed some quite bad checking^[8] running centrally up a post that he was also uncomfortable with’.

2.10 The matter remained in dispute and on 8 February 2018 the Ministry received an application for a determination.

3. Submissions

3.1 Along with the application for determination the agent provided copies of relevant correspondence, including the engineer’s letter of 5 September 2017, the final inspection notice and a set of drawings. The agent later provided a copy of a statement from the timber supplier dated 21 February 2018 (see paragraph 2.2).

3.2 On 19 February 2018 the authority provided a submission, dated 16 February, in response to the application and questions put to it by the Ministry. The authority submitted:

- The posts have not been installed in accordance with the building consent, which specified treatment to H3.2.

⁶ New Zealand Standard NZS 3604:2011 Timber-framed buildings.

⁷ See for example Determinations 2004/10, 2004/71, 2007/97, and 2007/129.

⁸Checks can cause significant loss of shear strength, and create cosmetic and durability problems.

- The posts provide structural stability to the building, accordingly the relevant durability period is 50 years.
 - Decay may not be uniform over the length – it is likely to be accelerated around the base of the post that is exposed close to ground atmosphere.
 - Replacement of the posts requires removal of the soffits, and as the posts are too large to be handled/replaced by an average owner it would require tradesmen to undertake the work.
 - In the previous determinations, the underlying basis for acceptance of Lawson Cypress was an additional level of protection and Cypress species as structural members in exterior exposed conditions will not achieve compliance with Clause B2 without treatment.
 - In the category for timber members where exposed to exterior weather conditions and dampness but not in ground contact, Lawson Cypress is not a type of timber referenced in NZS 3602.
 - No information was provided regarding the grade of timber (heart or sapwood).
 - No response has been received regarding the checks in the posts, some of which appear to extend the full length.
- 3.3 The authority also provided two photographs of the posts. Checks are visible in the centre of two posts where the post is bolted to the bracket. One of the checks appears to run approximately three-quarters the length of the post.
- 3.4 In an email dated 27 March 2018, the agent provided the following information, in response to a request for further information from the Ministry:
- Drawings showing the 450mm and 600mm overhang to the porch roof.
 - In regard to a timber check running upwards from the third bolt in two of the posts, the engineer reviewed a photograph after construction and requested additional bolting to the posts. The supplied detail showed two M12 bolts to be installed to the faces with the third bolt. (I have not received any information to indicate the additional M12 bolts have been installed.)
- 3.5 On 6 April 2018 the agent provided further information regarding the construction:
- The bottoms of the posts are approximately 190mm off the ground. The deck has drainage underneath, so there is no likelihood of flooding or water building up high enough to the base of the posts.
- 3.6 A draft determination was issued to the parties for comment on 16 April 2018.
- 3.7 On 17 April 2018 the authority accepted the draft determination, and made no further comment.
- 3.8 On 9 May 2018 the Ministry sent a reminder for comment to the agent and the builder, as no response from either party had been received.
- 3.9 On the same day the agent responded that he was waiting on clarification from the authority regarding treatment of the posts. On 10 May 2018 the authority responded to the agent’s question noting it would not accept an “over coating of ‘H3.2’” because it had not received any supporting information to show the proposed treatment application would comply with Clause B2.

- 3.10 On 22 May 2018 the Ministry sent a further email to the agent and the builder requesting a response to the draft determination before issuing the determination. The agent acknowledged the request, noting he was waiting for confirmation from the builder how they intended to proceed. No further submission was received from the agent or the builder.

4. Discussion

4.1 The required durability period under Clause B2.3.1

- 4.1.1 Clause B2.3.1 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”:

B2.3.1

Building elements must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the specified intended life of the building, if stated, or:

- (a) the life of the building, being not less than 50 years, if:
- (i) those building elements (including floors, walls, and fixings) provide structural stability to the building, or
 - (ii) those building elements are difficult to access or replace, or
 - (iii) failure of those building elements to comply with the building code would go undetected during both normal use and maintenance of the building.
- (b) 15 years if:
- (i) those building elements (including the building envelope, exposed plumbing in the subfloor space, and in-built chimneys and flues) are moderately difficult to access or replace, or
 - (ii) failure of those building elements to comply with the building code would go undetected during normal use of the building, but would be easily detected during normal maintenance.
- (c) 5 years if:
- (i) the building elements (including services, linings, renewable protective coatings, and fixtures) are easy to access and replace, and
 - (ii) failure of those building elements to comply with the building code would be easily detected during normal use of the building.

- 4.1.2 There has been some dispute as to which durability period applies in this case. The authority is of the view it is 50 years because the posts are a structural element. The engineer is of the view it is 5 years because the posts are easy to access and replace and any failure would be easily detected during normal use of the building.
- 4.1.3 This matter has been addressed in a number of previous determinations that considered the durability of Lawson Cypress or of Macrocarpa – see for example Determination 2004/10⁹.
- 4.1.4 In this case, the posts provide structural stability to a part of the building, namely the portico roof, and therefore come within Clause B2.3.1(a)(i) i.e. have a durability period of not less than 50 years. While I note the engineer’s statement the posts

⁹ Determination 2004/10 Durability of untreated timber veranda posts (22 April 2004)

would be easy to replace, it does not necessarily follow the posts have only a five year durability period for that reason.

- 4.1.5 I also note Table 1 in NZS 3602 lists the timber treatment levels for various wood-based building components to achieve 50, 15 or 5 year durability performance. Components such as posts, piles, and wall framing are components listed as needing to achieve 50 year durability. Weatherboards, exterior joinery, and non-load bearing wall framing are listed underneath the 15 year durability. Whereas, the 5 year durability contains components such as interior finishing timber (e.g. mouldings and skirtings), and shelves.

4.2 Durability performance

- 4.2.1 In evaluating the likely performance of the posts, it is useful to make some comparisons with the relevant Acceptable Solution¹⁰ in this case B2/AS1, which cites NZS 3602¹¹ as an Acceptable Solution for meeting the durability requirements of timber used in the building. NZS 3602 specifies H3.2 treated Radiata Pine for posts and beams exposed to exterior weather conditions and dampness but not in ground contact. The exposed heart Lawson Cypress timber posts must therefore be assessed as an alternative solution.
- 4.2.2 The approach in determining whether the exposed timber posts are durable involves an examination of their positions within the building, the surrounding environment, the design features likely to limit water penetration into the timber, and the moisture tolerance of the timber used.
- 4.2.3 The durability of this timber species has been considered in previous determinations which concluded that durability for the life of the building, not being less than 50 years, is possible if untreated Lawson Cypress timber is used in an external situation, but only if all the following criteria are met:
- only full heartwood timber is used¹²
 - there is no contact with the ground
 - there are no unprotected exposed cut surfaces or joints
 - there are no horizontal or other surfaces where water could collect or sit
 - the timber is able to dry out after being subjected to moisture.
- 4.2.4 Previous determinations (2004/71, 2007/135, and 2008/087) have recognised;
- In Determination 2004/71 (which considered the durability of 200mm square posts with some protection from the weather), heart *Macrocarpa*¹³ is equivalent to Radiata Pine with H3.2 preservative treatment.
 - In Determination 2007/129 (which considered the durability of 100mm square posts) heart Lawson Cypress posts which could not drain and dry would not meet the durability requirements of the Building Code and would be required to be treated with preservative.

¹⁰ An Acceptable Solution is a prescriptive design solution approved by the Ministry that provides one way (but not the only way) of complying with the Building Code. The Acceptable Solutions are available from the Ministry's Website at www.building.govt.nz.

¹¹ New Zealand Standard NZS 3602:2003 Timber and wood-based products for use in building.

¹² The sapwood of Lawson Cypress timber is very similar in appearance to heartwood but has little durability in exposed situations.

¹³ *Macrocarpa* is one of the Cypress species (named *Cupressus macrocarpa*), which also includes Lawson Cypress and Mexican Cypress, NZS 3602 "Timber and Wood-based Products for Use in Building" considers them as one group (Cypress species) for the purpose of the Standard.

- In Determination 2008/087 (which considered the durability of exposed Macrocarpa rafters) the average life of 50mm thick cypress heartwood is 15-25 years when located away from the ground, but fully exposed to the weather.
- 4.2.5 In this case the posts are 250mm x 250mm thick, and the engineer has expressed the view that a large amount of decay would need to occur before the structural integrity was compromised. While oversizing members allows for loss of performance due to timber degradation in some circumstances, I have not received any evidence as to the rate at which Lawson Cypress can be expected to rot and I offer no opinion as to whether oversizing is an appropriate method of increasing durability under fungal attack.
- 4.2.6 In relation to the specific characteristics in this case, I note the following:
- Only minimal protection is provided by the portico roof overhang.
 - Although the vertical posts will shed water, the checks in the timber form areas where water can be trapped or that are unable to dry out.
 - There is no evidence the cut ends have been treated with a surface preservative, and the checks are unlikely to be able to be adequately treated with a surface preservative.
 - The decking is laid around the base of the posts. The size of the gap between the decking and the posts is not clear. The timber deck joists and related structure appear to abut the base of the posts. Water will collect on the decking around the post, and where the joists abut the posts underneath the decking.
 - The base of the posts has limited exposure by virtue of being located underneath the timber decking and in close proximity to the ground. However, decay in the base of the posts as built will not be easily detected.
- 4.2.7 I take the view the posts in this building will not achieve the durability required by Clause B2.3.1.
- 4.2.8 It isn't clear whether the checks have been caused by drying or changes in the moisture content, or as a result of mechanical damage when installed. I note the engineer has proposed additional M12 bolts to be installed to the posts after reviewing photographs of the checks. I have not considered whether the construction complies with Clause B1.
- 4.2.9 I emphasise each determination is conducted on a case-by-case basis. The fact that particular timber elements have been established as being not code-compliant in some determinations in relation to a particular building does not necessarily mean the same timber elements will not be code-compliant in another situation.

5. The decision

- 5.1 In accordance with section 188 of the Building Act 2004, I hereby determine the portico support posts do not comply with Clause B2.3.1(a), and accordingly, I confirm the authority's proposed exercise of its power of decision to not issue the code compliance certificate on that basis.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 6 July 2018.

Katie Gordon
Manager Determinations