



## Determination 2011/056

# Regarding compliance of brick veneer and proposed remedial work to windows to a house at 50 Karner Drive, RD6, Te Puke (to be read in conjunction with Determination 2008/100)

### 1. The matters to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“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.
- 1.2 The applicants are the owners, B and L Fox (“the applicants”) acting through the designer as an agent (“the designer”). The other party is the Western Bay of Plenty District Council (“the authority”) carrying out its duties and functions as a territorial authority or building consent authority.

### 1.3 The reason for the application

- 1.3.1 I have previously described certain building matters regarding this house. Those matters are described in Determination 2008/100 (“the first determination”). This determination arises from concerns regarding the compliance of a two-storey high brick veneer wall, and also from the decision by the authority to refuse to issue an amended building consent for proposed repairs to some window jambs.
- 1.3.2 The authority is not satisfied that:
- the proposed method of repairing the window jambs will comply with Clauses B2 Durability and E2 External Moisture<sup>2</sup> of the Building Code
  - the brick veneer to the two-storey chimney gable wall (“the chimney gable wall”) complies with Clause B1 of the Building Code, due to the lack of engineer’s inspections.

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<sup>1</sup> The Building Act, Building Code, Compliance documents, past determinations and guidance documents issued by the Department are all available at [www.dbh.govt.nz](http://www.dbh.govt.nz) or by contacting the Department on 0800 242 243.

<sup>2</sup> 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

1.4 The matters to be determined<sup>3</sup> are therefore:

**1.4.1 Matter 1: The two-storey brick veneer walls**

Whether the two-storey areas of brick veneer comply with Clause B1 of the Building Code. I consider this in paragraph 7.

**1.4.2 Matter 2: The proposed window jamb repairs**

Whether the modifications proposed by the consultant to the jambs of exposed windows in the monolithic-clad walls will comply with Clause E2 External Moisture and Clause B2 Durability. I consider this in paragraph 8.

**1.5 Matters outside this determination**

1.5.1 I have previously described certain building matters regarding the cladding system to this house. Those matters are described in Determination 2008/100 (“the first determination”) issued on 5 November 2008. As a result of the first determination the authority issued a notice to fix, which included the items described in paragraph 1.4.

1.5.2 Other requirements in the notice to fix are not in dispute, and the application for this determination was limited to items outlined in Matter 1 and Matter 2 above. The remaining windows and claddings are not considered further in this determination.

1.6 In making my decision, 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 the other evidence in this matter.

**2. The building work**

2.1 The building work consists of a two-storey detached house situated on a level rural site. Construction is of conventional light timber frame with concrete foundations and floor slab, untreated timber-framed exterior walls, brick veneer and monolithic wall claddings, pressed metal tile roofing and aluminium windows.

**2.2 The brick veneer**

2.2.1 On the north and south elevations, some sections of the brick veneer extend the full height of two storeys. The brickwork questioned by the authority is ‘the brick veneer to the chimney area up to a height of 5.5m’. However, this determination assesses the two-storey brick veneer panels to both the north and south elevations.

2.2.2 The brick veneer walls that are the subject of this determination are:

- the gable end wall on the north elevation, which incorporates a central monolithic-clad ‘chimney’ structure that extends up past the roof gable, with adjoining brick veneer panels that are 2 metres wide and extend to a maximum of 5.5 metres high at the apex
- the brick veneer panel to the south elevation, which is about 3 metres wide and extends up to the upper roof eaves, to a height of 5 metres.

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<sup>3</sup> Under section 177(1)(a) and 177(b)(i) of the Act

## 2.3 The windows

- 2.3.1 The subject windows are installed within the monolithic cladding to the upper walls. The cladding consists of fibre-cement sheeting direct fixed through the building wrap to the framing, and finished with a sprayed texture painted finish. At the two upper decks the walls and windows are sheltered beneath deep roof overhangs, while remaining windows are more exposed and are the subject of this determination.
- 2.3.2 The proposed modification to the jambs of exposed windows involves:
- removing existing textured coating system at the sides of the windows
  - applying sealant beneath the aluminium jamb flanges
  - installing scribes against jamb flanges, which:
    - are formed from 19mm x 19mm timber rebated to extend about 7mm over the edge of the window flange
    - are fixed with stainless steel screws through the backing sheets into the framing, with sealant applied between the scribe and the fibre-cement
    - extend to fit under the existing head flashings
  - recoating and repainting the fibre-cement.

## 3. Background

- 3.1 The first determination found that the house did not comply with certain clauses of the Building Code, and confirmed the authority's refusal to issue a code compliance certificate after identifying certain defects and information required.
- 3.2 In the summary of the expert's report, paragraph 5.6 stated that the expert noted various defects, which included:
- The junction of the aluminium joinery jambs and the fibre-cement cladding rely on a fillet of sealant for weathertightness...
- 3.3 The first determination therefore found the claddings did not comply with clauses B2 and E2, after identifying certain cladding faults as set out in paragraph 7.6 of the first determination. Included in those faults was:
- The jambs of the aluminium joinery installed in the fibre-cement cladding (that are not protected by the wide eaves to the decks).
- 3.4 In paragraph 8.5, the first determination also stated that there was:
- ...insufficient information regarding the code compliance of the two-storey brick cladding... ...and I therefore cannot form a view as to the building's compliance with Clauses B1....
- 3.5 In paragraph 10.2, the first determination suggested that, following the issue of a notice to fix:
- The owner should then produce a response to this in the form of a detailed proposal, together with suitable amendments to the plans and specifications, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified matters.

3.6 Under cover of a letter to the applicant dated 20 January 2009, the authority attached a notice to fix (which I have not seen), stating:

This has been issued to you as a result of determination number 2008/100 which contained the instruction to do so.

As recommended in that determination you should now apply to [the authority] for an amendment to the building consent.

In that application you should show in detail how it is proposed to remedy the defects in the Notice to Fix.

3.7 On behalf of the applicant, the designer provided details of proposed remedial work and applied for amendments to the original building consent (No. 6398). The authority responded in a letter dated 6 July 2009; listing certain matters that 'require attention'. The list included:

4. The proposed installation of the rebated scribe detail to overcome the faulty window weatherproofing does not comply with E2/AS1. This will require a determination by [the Department] for Council to accept this detail...
- 7 As the brick veneer to the chimney area up to a height of 5.5 metres and (sic) has not been inspected, [the authority] will require evidence that the veneer is installed complying to code requirements.

3.8 The Department received an application from the designer on 10 May 2010. The Department sought the applicant's confirmation for the designer to act on their behalf for the application; and that approval was received on 20 July 2010.

## **4. The submissions**

4.1 The designer forwarded copies of:

- Determination 2008/100
- a detail showing the proposed jamb repairs
- a partial elevation showing the existing brick veneer to the gable end wall
- the authority's letter dated 20 January 2009
- the authority's letter dated 6 July 2009.

4.2 The authority did not acknowledge the application or make any submission.

4.3 In making no submission, the authority did not provided any evidence as to why it believes the proposed window jamb detail not code compliant. I do not believe that this is acceptable. If a building consent application is refused, it is important that an owner be given clear reasons why. The owners can either then act on those reasons or apply for a determination if they dispute them.

4.4 A draft determination was issued to the parties for comment on 1 December 2010. The authority did not accept the draft as it did not consider the procedure to confirm compliance of the brick veneer with Clause B1 of the Building Code was sufficiently clear. I have included some further basis for consideration of this matter.

- 4.5 The applicants, through their legal advisor, repeatedly sought extensions of time to respond to the draft determination to enable them to ‘obtain further expert opinion in relation to the brickwork’. I have been provided with no further submission from the applicants or the designer. A final request for submissions was made on 19 May 2011, to which no response was received.

## **5. Establishing compliance of the two-storey brick veneer walls**

- 5.1 The expert’s report prepared for the first determination focussed on the weathertightness aspects of the external building envelope, with limited attention paid to the two-storey brick veneer sections. On the evidence available at that time, I was therefore unable to determine whether those two-storey brick walls complied with Clause B1 of the Building Code (refer paragraph 3.4). In order to form a view on the structural compliance of the two-storey brick walls, I have therefore sought further information about those walls.
- 5.2 I consequently engaged an independent expert to seek further information, as mentioned in paragraph 1.6. That expert is a member of the New Zealand Institute of Building Surveyors and had undertaken the earlier assessment of the building work for the first determination.

## **6. The expert’s report on the brick walls**

- 6.1 The expert re-visited the house on 15 September 2010 to assess the compliance of the two-storey high brick veneer, and provided a report dated 22 September 2010, which noted that his report was based on the visual inspection of the brick veneer.
- 6.2 The expert noted that original building consent had been issued in 2000, and the brick veneer was in ‘excellent condition’, with ‘no evidence of cracking, movement or excessive stress’.

### **6.3 The basis for assessment**

- 6.3.1 The brickwork on this house was not subject of specific design. The expert used NZS 3604<sup>4</sup> as a reference to assess the brickwork, noting that if walls are beyond the scope of NZS 3604 then other standards apply. (I note that, for this house, NZS 4229<sup>5</sup> could be a relevant standard.)
- 6.3.2 The expert noted that NZS 3604 is adopted as an acceptable solution for masonry veneer on timber-framed walls that fit with certain dimensional limits:
- do not exceed 7m in height above finished ground level
  - do not exceed 5.5m in height on a gable end wall
  - do not exceed 4m in height for other walls.

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<sup>4</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

<sup>5</sup> New Zealand Standard NZS 4229:1999 Concrete masonry buildings not requiring specific engineering design

## **6.4 The north gable brick panels**

- 6.4.1 The expert noted that the two brick panels to the north gable wall are separated by the timber-framed chimney structure, with two vertically aligned windows to each panel. The upper windows have curved tops with brick arches.
- 6.4.2 The panels are each 2m wide and extend to a maximum of 5.5m at the apex, with a maximum height above finished ground level of about 5.7m. The expert therefore concluded these panels are within the scope of NZS 3604. (I note that the minimum width of the brickwork beside the windows is between 300mm and 400mm, which is within the minimum veneer length of 230mm. I also note that the photographs of these windows indicate that the return walls to the chimney separating the two brick panels provide a stabilising buttress to the over height “gable-like” sections of the panel.)

## **6.5 The south brick panel**

- 6.5.1 The expert observed that the single brick veneer panel to the south wall has no windows in the lower wall, with one large central window to the upper wall. The upper window has a curved top with a brick arch.
- 6.5.2 The panel is 2.95m wide and extends to a maximum of 5m beneath the eaves, with a maximum height above finished ground level of about 5.2m. (I also note that the minimum width of the brickwork beside the windows is about 300mm.) The expert therefore concluded the height of this panel is beyond the scope of NZS 3604.
- 6.5.3 Without destructive investigation, the expert could not establish whether this wall panel had been constructed in accordance with other applicable standards (such as NZS 4203, referenced in NZS 3604).
- 6.6 However, the expert concluded:
- Given the excellent performance history, a high degree of confidence exists that the walls under normal conditions will continue to meet the requirements of Clause B1 of the New Zealand Building Code.
- 6.7 A copy of the expert’s report was provided to the parties on 9 June 2010.

## **Matter 1: The two-storey brick veneer walls**

### **7. Discussion**

#### **7.1 The north gable brick panels**

- 7.1.1 Taking account of the expert’s report, I am satisfied that the dimensions of the north gable brick panels, which are buttressed to an extent by the chimney, are within the scope of NZS 3604.
- 7.1.2 I also consider that the expert’s report provides me with reasonable grounds to conclude that the north gable brick panels comply with Clause B1 and B2 of the Building Code.

## **7.2 The south brick panel**

7.2.1 Taking account of the expert's report, I am satisfied that the height of the south brick panel is beyond the scope of NZS 3604 as it is 1 metre higher than the limit of 4 metres for walls rising to eaves level.

7.2.2 Whilst neither NZS 3604 nor NZS 4203 discusses the point, I note:

- The difference in permitted maximum heights appears to relate to the nature of the supporting structure, viz. timber or block masonry, and most probably its stiffness, but not necessarily to the seismicity of the site.
- Both these standards were developed to be compatible with the loading standards of the time, viz. NZS 4203:1992 which recognises different seismic coefficients around the country
- Consequently, for a given supporting material, and in the absence of a more sophisticated specific design check, it is logical to consider that the standards must be conservative, and cover the worst case, i.e. the most severe seismic location and its application.

7.2.3 Based on the above and without any provision of specific design information that demonstrates any stiffness enhancement within or to the timber support framing, or other means by which the face load deflections under seismic loads are mitigated (such as the provision of buttressing to the upper panel ends) I am unable to justify the height of the brick veneer beyond the limit specified in the Standard.

7.2.4 In Determination 2008/100 paragraphs 5.3, 8.3 and 8.5, the requirements for the brickwork to be subject to a specific design check by an engineer (using the principles outlined in 7.2.3 above) were established, and I considered that without that I could not form a view as to compliance of the brickwork with Clause B1.

7.2.5 I am still of this view but note that the above comments, and the expert's observations may be considered as part of the design check.

## **Matter 2: The proposed window jamb repairs**

### **8. Weathertightness of the proposed detail**

#### **8.1 Discussion**

8.1.1 On consideration of the designer's detail described in paragraph 2.3.2, the proposed jamb repairs appear to be adequate in that the sealant becomes a secondary line of defence against moisture ingress and is protected from UV light. However, I consider that the following additional information should be provided:

- a detail showing how the scribe will fit under the existing head flashings
- a detail showing the bottom of the scribe (at the window sills).

8.1.2 Providing these additional details are approved by the authority, I am able to conclude that the proposed repairs to the window jambs are likely to provide adequate weathertightness and durability to the exposed windows of this house.

## **8.2 The authority's response to the proposed detail**

- 8.2.1 The authority stated that the designer's proposal to repair the window jambs with a planted timber scribe was not acceptable because it 'does not comply with E2/AS1' (see paragraph 3.7). I do not believe this is an acceptable reason for refusing to accept the proposal. The acceptable solution E2/AS1 is one way, but not the only way, of demonstrating compliance with the performance requirements of Clause E2 of the Building Code.
- 8.2.2 The detail submitted by the designer is simple; and assessing such a straightforward proposal should have been well within the capabilities of the authority, without requiring a determination on the matter. If the authority has questions about any aspects of the proposal, it is entitled to require further information (such that identified in paragraph 8.1.1) in order to be satisfied, on reasonable grounds, that the proposed repair will comply with the weathertightness and durability provisions.

## **9. The decision**

- 9.1 In accordance with section 188 of the Building Act 2004, I hereby determine that:
- providing the additional details outlined in paragraph 8.1.1 of this determination are approved by the authority, the proposed window jamb repairs will result in the windows of this house complying with Clauses E2 and B2 of the Building Code
  - there is insufficient evidence to establish on reasonable grounds that the two-storey high brick veneer panel on the south elevation complies with Clause B1 of the Building Code.

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

John Gardiner  
**Manager Determinations**