

## Determination 2006/84

### **Refusal of a code compliance certificate for alterations to a building with a fibre cement sheet cladding system at 8 Homebush Road, Khandallah, Wellington**



#### **1. The dispute 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, Determinations Manager, Department of Building and Housing, for and on behalf of the Chief Executive of that Department. The applicant is the builder Mr Jaquiere (“the applicant”), acting on behalf of the owner Mr Walbran, and the other party is the Wellington City Council (“the territorial authority”).
- 1.2 The dispute for determination is whether the territorial authority’s decision to decline to issue a code compliance certificate for new cladding to part of an existing house because it was not satisfied that the cladding to the walls of the alterations complied with either the building consent or with clause E2 “External Moisture” and clause B2

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<sup>1</sup> The Building Act 2004 is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

“Durability” of the Building Code<sup>2</sup> (First Schedule, Building Regulations 1992) is correct.

- 1.3 The question to be determined is whether I am satisfied on reasonable grounds that the wall cladding as installed to some of the walls of the building (“the cladding”), complies with the Building Code (see sections 177 and 188 of the Act). By “the wall cladding as installed” I mean the components of the system (such as the backing materials, the flashings, the joints and the coatings) as well as the way the components have been installed and work together.
- 1.4 In order to determine the question in paragraph 1.3, I must determine whether I am satisfied on reasonable grounds that the cladding as installed over the original timber weatherboards on two walls of the house will, under section 112 (1) (b) of the Act, “continue to comply with the other provisions of the building code to at least the same extent as before the alteration”.
- 1.5 In making my decision, I have considered the submissions of the parties, the report of the independent expert commissioned by the Department to advise on this dispute (“the expert”), and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.1. I have not considered any other aspects of the Act or the Building Code.

## **2. The building**

- 2.1 The building work consists of new windows and cladding to two small walls of a detached house situated on a south-facing, steeply sloping and excavated site, which is in a very high wind zone for the purposes of NZS 3604<sup>3</sup>. The house is two-storeys high on the south elevation and one storey on the north, with a part basement to the south. Construction of the house is conventional light timber frame, with the original “bungalow” constructed in the 1930’s and extended by a small wing to the east during the 1960’s. The original house had timber windows, rusticated weatherboards on upper walls and stucco to basement walls. The new fibre cement sheet cladding is to the 4100mm east face of the wing, extending around the corner to cover 6300mm on the upper south wall and 5300mm on the basement. The timber windows in these reclad walls have been replaced with new aluminium windows. The house shape is simple in plan and form, with a profiled metal gabled roof that has eaves and verge projections of about 500mm, excluding gutters and fascias. The original bevel-backed weatherboard gable ends are unchanged, as is the roof.
- 2.2 The expert has noted that the timber framing is Rimu, and the timber weatherboards appear to be heart Matai. The weatherboards are also described as heart Matai in the application. Given the age of the house and the fact that the weatherboards are in good condition I accept that the weatherboards are heart Matai.
- 2.3 The cladding system to the reclad walls of the building is a “James Hardie Titan board” system with 9mm fibre cement sheets fixed over building wrap and 20mm H3

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<sup>2</sup> The Building Code is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>3</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

treated timber battens. The battens have been fixed over the original weatherboard and stucco claddings, which are intended to form the rigid air barrier (RAB) shown in the manufacturer's instructions. Aluminium jointers and Inseal strips are used at vertical joints of the Titan board, and a stainless steel flashing is used at the inter-storey horizontal joint.

- 2.4 I have seen no evidence of producer statements or warranties for the cladding.

### **3. Sequence of events**

3.1 The territorial authority issued a building consent on 20 July 2005. The proposed alterations included re-cladding of two walls of the east wing, in order to improve the weathertightness of the original rusticated weatherboard cladding and the associated timber windows (which had reportedly been prone to leakage in high wind conditions).

3.2 The territorial authority carried out a preline inspection on 23 September 2005, and the inspection record describes the cladding system as "Hardies titan cavity system" and notes "Hardies rep to sight". A final inspection was carried out on 7 November 2005, and a number of outstanding items were recorded, including the requirement for "clarification of flashings, RAB/building wrap".

3.3 The territorial authority issued a notice to rectify using a pro-forma handwritten form dated 14 December 2005, with the "Particulars of Contravention or non-compliance" including:

No prewrap/post wrap or preline inspections. Unable to sight wrap, battens, flexible flashings. Work carried out does not comply with consent documents.

The accompanying "Site Report", also dated 14 December 2005, noted that the building work was "not approved to issue CCC", and included a requirement for:

Hardies to verify that they will guarantee their product due to RAB board not used as per manufacturers specifications

3.4 In a letter to the territorial authority dated 18 December 2005, the applicant noted that a preline inspection had been carried out, during which the Inseal strips were sighted, and noted:

...the RAB (Rigid Air Barrier) was not installed, this was never intended to be, it was an oversight when downloading the hardies spec's and including same in the specification. The existing W/Bds work perfectly as a rigid back and under them is the original building paper.

The reason for the proposed work; Titan board over building wrap, over cavity, over WB, over building paper was to prevent the updraft winds from the harbour, which were driving up through the joins in WBs, as well as the leaking timber joinery.

I confirm that the battens used were H3 and dry and all fixing of the titan board were as per Hardie's specification but the system wasn't the Titan system, that system does not have weatherboards under the titan board.

- 3.5 In a letter to the applicant dated 30 December 2005, the territorial authority noted that the notice to fix related to the lack of adequate inspections and to the work not being completed in accordance with the consent; and requested further information, noting that:

Because of these concerns council cannot be satisfied on reasonable grounds that the works comply with the building consent and building code. At this point council would be unable to issue the code compliance certificate.

- 3.6 After receiving further information from the applicant, the territorial authority returned the documentation as “Council does not accept incomplete applications”, and asked for further information, including a requirement for:

Confirmation from an independent suitably qualified person that the alternative solution for the proposed cladding system will meet the requirements of the building code.

- 3.7 The applicant supplied further information to the territorial authority, and in the attached letter dated 14 February 2006 noted that the revised drawing was as-built rather than a change as what had been built was exactly what had been planned, and described the materials and condition of the original construction noting that:

...the framing is rimu and this was seen mainly on the south side in the basement where the leaking has been for at least 20 years and maybe 40 from when the additions were first constructed. The only damage was rotten gibboard and carpet, all window timber joinery was sound and in good order.

- 3.8 In a letter to the applicant dated 9 March 2006, the territorial authority noted that the information supplied had been reviewed and noted:

WCC does not believe on reasonable grounds that the existing weatherboards, acting as a rigid air barrier, achieves the performance criteria of the building code, including B2 durability. An independent person would be required to clarify that the alternative system used would comply with the building code.

- 3.9 An application for a determination was received by the Department on 19 April 2006.

## **4. The submissions**

- 4.1 In a letter to the Department dated 19 April, which accompanied the application, the applicant explained that he had communicated with the territorial authority over the past four months without agreement that the work complied with the building code. The applicant noted that a post wrap or pre-cladding inspection had never been possible as the original cladding had not been removed and the single area of damaged lining was inspected during the preline inspection, concluding that:

The points still in dispute are

1. Rigid Air Barrier: RAB. The WCC has refused to accept that the existing 22mm weatherboards which the designer specified to remain on the building and act as the RAB meets with James Hardie spec's for titan board therefore the WCC says the work as completed does not meet with the building code.
2. Amendment to building consent. An amendment to the building consent was applied for on this matter but was returned as incomplete.

- 4.2 The applicant forwarded copies of:
- the drawings and specifications
  - the inspection records
  - the correspondence with the territorial authority
  - various other technical information, producer statements and other statements.
- 4.3 The territorial authority made no initial submission, but noted that it would make a written submission once it had received and reviewed the expert's report.
- 4.4 In a letter to the Department dated 5 July 2006, the territorial authority responded to the expert's report (refer paragraph 5.6) and made a submission that outlined the history of the project, including the following summarised points:
- The consent was issued based on the manufacturer's specifications, and it was identified during construction that work was not in accordance with these.
  - Certain inspections were required to sight key construction processes, and the territorial authority had not been called on to undertake these inspections.
  - The producer statement PS3 is not adequate to confirm code compliance.
- The territorial authority concluded that:
- The Building Act requires a Territorial Authority to issue a Code Compliance Certificate for building work if it is satisfied on reasonable grounds the work meets the requirements of the Building Code. After reviewing the information provided as part of the expert's report, as well as the information provided by the builder it is not satisfied the cladding system currently being reviewed as part of this determination will meet those requirements.
- 4.5 Copies of the submissions and other evidence were provided to each of the parties. The territorial authority made no further submission in response to the applicant's submission.
- 4.6 A copy of the draft determination was forwarded to the parties for comment on 25 July 2006. The applicant responded in an email to the Department dated 31 July 2006, the territorial authority responded in a letter to the Department dated 25 August 2006.
- 4.7 The applicant accepted the draft determination and commented on the territorial authority's submission in an email to the Department dated 31 July 2006. The applicant described in detail the sequence of events and the difficulty involved in scheduling work and inspections on the project, and expressed his general concerns about the deterioration in on-site relationships with territorial authority officials.

- 4.8 In addition the applicant said:

I am now very concerned that [the territorial authority] will send a huge account as they have notified me they can do for the time involved at . . . \$120 per hour to cover time spent sorting out this matter (which they made the first mistake on) before they release the CCC. I seek that costs be set in the final determination.

- 4.9 From this I assume the applicant is seeking a remedy for costs associated with the determination under section 190 although this has not been specifically stated. The remedy sought in paragraph 4.8 is in respect of costs that might be applied by the territorial authority and not in respect of actual costs.
- 4.10 The application for costs should be the subject of a specific application to the Department under section 190 when it will be evaluated against the requirements of section 190. The question of costs will be a matter for a separate decision should an application be received.
- 4.11 In its letter to the Department dated 25 August 2006 the territorial authority repeated some of the points it had made in previous submission and expanded on others. The submission also stated that:

The code requires the cavity battens and supporting structure to have a durability of 50 years. It is expected the cavity battens have been treated as per NZS 3602: 2003 to a minimum level of H3.1. The existing weatherboard cladding is untreated. It appears the timber frame is untreated. However there is now an expectation by the code the weatherboards will achieve a durability of 50 years.

The submission concluded by saying:

In the case of this current determination, the Council does not consider the information presented to date confirms reasonable grounds.

The cladding system as installed (including the fibre cement sheet, the cavity battens and the existing weatherboards) is required to have a durability period of 15 years and not 50 years as claimed. I have considered the territorial authority's comments, and amended the draft determination as I have considered appropriate.

## **5. The expert's report**

- 5.1 The expert inspected the claddings of the building alterations on 17 May 2006, and furnished a report that was completed on 19 June 2006. The expert noted that "the quality of workmanship appeared to be of a reasonably high standard with no signs of unusual installation of the cladding." The expert also noted that there were no penetrations through the cladding, the clearance from the ground to the bottom of the cladding was adequate and the window installation appeared adequate, with aluminium head flashings and flexible sealants at jambs.
- 5.2 The expert removed a panel of cladding under the upper window on the east elevation, and observed that the underlying weatherboards matched the exposed weatherboards and were in good condition. The building wrap lapped over the top of the upstand of the inter-storey flashing.

5.3 The expert noted that the only signs of internal moisture were old water stains on skirtings from the original leaking timber windows. (This was confirmed by invasive moisture readings of only 10% within the adjacent framing.) The expert took non-invasive moisture readings through internal linings and no elevated readings were noted. Invasive readings were taken through the new cladding, and readings ranged from 15% to 18%.

Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure.

5.4 The expert noted no defects in the cladding system and no evidence of moisture penetration, concluding that the newly clad walls were weathertight.

5.5 A copy of the expert's report was provided to each of the parties on 22 June 2006.

5.6 In a letter to the Department dated 5 July 2006, the territorial authority outlined the history of the project (refer paragraph 4.4), and commented on the expert's report, noting that the report appeared to have been "limited to confirming compliance of the new work with the clause E2 External Moisture of the Building Code" and did not include comment on the following summarised issues:

- There is no independent confirmation that the weatherboard will achieve the same level of performance as the approved RAB.
- The weatherboards need to achieve the same level of durability as the cavity battens (including timber treatment).
- There is no information on the adequacy of the paint on the weatherboards or the cladding junctions.
- There is no double stud (as per E2/AS1) behind the cladding joints, as the existing cladding was not removed.
- The cladding has been fixed to the weatherboards, rather than to the framing.
- The installation of wrap to the window openings was not addressed.

5.7 I have taken the territorial authority's comments on the expert's report into account when considering the weathertightness performance of the cladding in this determination (refer paragraph 6.3).

## 6. Evaluation for code compliance

### 6.1 Evaluation framework

- 6.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solution<sup>4</sup>, in this case E2/AS1, which will assist in determining whether the features of this house are code compliant. However, in making this comparison, the following general observations are valid:
- Some Acceptable Solutions cover the worst case, so that they may be modified in less extreme cases and the resulting alternative solution will still comply with the Building Code.
  - Usually, when there is non-compliance with one provision of an Acceptable Solution, it will be necessary to add some other provision to compensate for that in order to comply with the Building Code.
- 6.1.2 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of the design of the building, the surrounding environment, the design features that are intended to prevent the penetration of water, the cladding system, its installation, and the moisture tolerance of the external framing. The Department and its antecedent, the Building Industry Authority, have also described weathertightness risk factors in previous determinations<sup>5</sup> (refer to Determination 2004/1 *et al*) relating to cladding and these factors are also used in the evaluation process.
- 6.1.3 The consequences of a building demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.

### 6.2 Weathertightness risk

- 6.2.1 In relation to these characteristics I find that the newly clad walls to this house:

- are on two small walls of a house in a very high wind zone
- are a maximum of two storeys high
- are simple in plan and form
- have eaves and verges of 500mm, excluding gutter widths, above all walls
- have fibre cement sheet cladding, which is fixed over a 20mm drained cavity

<sup>4</sup> An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way, but not the only way, of complying with the Building Code. The Acceptable Solutions are available from the Department's website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>5</sup> Copies of all determinations issued by the Department can be obtained from the Department's website.

- Have treated cavity battens fixed over the existing original weatherboards, building paper, and rimu wall framing.
- 6.2.2 When evaluated using the E2/AS1 risk matrix, one elevation of the recladding work demonstrates a low weathertightness risk rating and the other a moderate risk rating. The matrix is an assessment tool that is intended to be used at the time of application for consent, before the building work has begun and, consequently, before any assessment of the quality of the building work can be made. Poorly executed building work introduces a risk that cannot be taken into account in the consent stage but must be taken into account when the building as actually built is assessed for the purposes of issuing a code compliance certificate.
- 6.3 Weathertightness performance**
- 6.3.1 Generally the cladding appears to have been installed in accordance with good trade practice, with junctions and edges well constructed as described in paragraph 5 and in the expert's report.
- 6.3.2 I consider that there a number of basic issues to be assessed when evaluating the weathertightness performance of the particular system of construction used for the alterations to this house, and these are addressed in the following paragraphs.

### **The rigid air barrier**

- 6.3.2.1 I note that the cladding system used (an alternative solution) follows the principles of the manufacturer's recommendations, with a different material used for the rigid air barrier. I consider that the cladding system used for this house is likely to provide adequate pressure moderation through the complete wall construction by means of:
- the sheet cladding, building wrap and drained cavity
  - the weatherboards and building paper providing some pressure drop at the wall framing
  - the interior linings and window seals supporting the remaining pressure drop.

I therefore consider that any moisture that may penetrate the outer cladding will be drained away within the cavity, without being drawn further into the wall framing via the air pressure differences between the outer and inner faces of the walls during very high winds.

### **The durability of the weatherboards**

- 6.3.2.2 I note that, while the original weatherboards experienced air penetration through the laps, the expert noted no evidence of moisture penetration through the weatherboards and reported these to be good condition. I also note that heart Matai is a durable timber species, and consider that the weatherboards are likely to remain adequately durable positioned at the "dry" side of the ventilated cavity and protected from the effects of ultraviolet rays.

- 6.3.2.3 I observe the weatherboards have a proven performance in use where they have been protected only by paint. The protection now afforded by the new fibre cement sheets will be greater. I note that NZS 3602:2003, Table 1, does not require any treatment to heart Matai in order to achieve a 50-year durability where the timber is protected from the weather but exposed to ground atmosphere. The BRANZ publication “Selecting Timber”, dated August 2004, describes heart Matai as a durable timber that also “dries readily”.

### **The fixings of the new cladding**

- 6.3.2.4 I note that the cavity battens have been fixed through the heart Matai weatherboard and into the framing with 75mm nail fixings to provide about 35mm penetration into the rimu framing (which has good nail-holding capability). I also note that the fibre cement panels are fixed through the battens and weatherboards into the framing with 75mm stainless steel screws. I consider that the fixings provided together with the nature of the original timber species will provide adequate support of the new cladding.

### **The lack of inspection during construction**

- 6.3.2.5 I acknowledge the territorial authority’s concern with regard to the lack of opportunity to inspect the underlying cavity at the time of construction and, notwithstanding the timing difficulties involved in very small projects such as this one, agree that the builder was remiss in not ensuring that the required inspections were undertaken. However, the expert has removed a panel below an original window position (a high risk location) and his report on the condition of the original weatherboards and details of the new underlying construction has allowed me to assess the compliance of the wall cladding as constructed.

### **The improvement to weathertightness**

- 6.3.2.6 In the case of the alterations to this house, I also consider that the new cladding system will improve the weathertightness of the building in comparison to the inadequate weathertightness of the original walls and cladding (as evidenced by past moisture penetration through the original windows as noted in paragraph 5.3).
- 6.3.2.7 I note that, as outlined in paragraph 1.4, the requirements for this overlaid cladding are lower (under section 112(1)(b) of the Act) than those applying to the cladding of a new building. The new cladding is not currently allowing the ingress of moisture, and the lack of defects in the alteration work indicates that the cladding system will (at the least) continue to comply with the building code to the same extent as it did prior to the addition of the new cladding.
- 6.3.2.8 Notwithstanding the territorial authority’s comments (refer paragraphs 4.4 and 5.6) with regard to lack of inspections and variations from the building consent, I consider that I am entitled to conclude the alterations to this house as they have been built comply with both the Building Code and with the building consent and I have done so in this determination. The rationale for this conclusion is set out in paragraphs 6.3.1 to 6.3.2.7 (inclusive).

## 7. Conclusion

- 7.1 I am satisfied that the current performance of the new cladding is adequate because it is preventing water penetration into the building at present. I am also satisfied that there are no cladding faults in the building alterations which are likely to allow the ingress of moisture in the future. Consequently, I am satisfied that the cladding system as installed on several walls of the building complies with clauses E2 and B2 of the Building Code. In addition I am also satisfied that the work complies with the building consent.
- 7.2 Effective maintenance of claddings is important to ensure ongoing compliance with clauses B2 and E2 of the Building Code and is the responsibility of the building owner. Clause B2.3.1 of the Building Code requires that the cladding be subject to “normal maintenance”, however that term is not defined in the Act.
- 7.3 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 cladding, the extent and nature of the maintenance will depend on the material, or system, its geographical location and level of exposure. Following regular inspection, normal maintenance tasks shall include but not be limited to:
- where applicable, following manufacturers’ maintenance recommendations
  - washing down surfaces, particularly those subject to wind-driven salt spray
  - re-coating protective finishes
  - replacing sealant, seals and gaskets in joints.
- 7.4 In the circumstances, I decline to incorporate any waiver or modification of the Building Code in this determination.

## 8. The decision

- 8.1 In accordance with section 188 of the Act, I hereby determine that the cladding system as installed complies with clause E2 and clause B2 of the Building Code and the building consent. Accordingly, I find the territorial authority’s decision to refuse to issue a code compliance certificate was incorrect, and a code compliance certificate should now be issued.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 6 September 2006.

John Gardiner  
**Determinations Manager**