Department of Building and Housing
Te Tari Kaupapa Whare

Determination 2009/40

Refusal to issue a code compliance certificate for 9-year-old building with timber weatherboard cladding at 820 Irwell-Rakaia Road, Leeston

1. The matter 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 applicant is the owner, White Gold Ltd ("the applicant") acting through its lawyer ("the lawyer"), and the other party is the Selwyn District Council ("the authority") carrying out its duties and functions as a territorial authority or building consent authority.

1.2 This determination arises from the decision of the authority to refuse to issue a code compliance certificate ("CCC") for a 9-year-old building because it is not satisfied that the building work complies with certain clauses of the Building Code[2] (First Schedule, Building Regulations 1992).

[1] The Building Act 2004 is available from the Department's website at www.dbh.govt.nz.
[2] The Building Code is available from the Department's website at www.dbh.govt.nz.
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.

1.3 I take the view that the matters for determination are:

1.3.1 Matter 1: The cladding

Whether the cladding as installed on the building ("the cladding") complies with Clause E2 "External Moisture" of the Building Code. By "the cladding as installed" I mean the components of the system (such as the weatherboards, the facing boards, the flashings and the joints) as well as the way the components have been installed and work together.

1.3.2 Matter 2: The durability considerations

Whether the elements that make up the building comply with Building Code Clause B2 "Durability", taking into account the age of parts of the building.

1.4 Because the additional matter of the compliance of the balustrade with Building Code Clause B1 "Structure" has been brought to my attention, I have included reference to this in my decision.

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.

2. The building

2.1 The building work consists of a detached house situated on a flat rural site, which is in a high wind zone for the purposes of NZS 3604[3]. The house is octagonal in plan, with a partial third floor that accommodates a games room, and an attached garage forms a single-storey wing. The building work has concrete foundations and floor slabs, light timber frame construction, aluminium windows and timber weatherboard cladding. The 15^{o} pitch profiled metal roof over the house follows the octagonal shape, with a gable roof over the garage wing. The roof has no eaves or verge projections.

2.2 A 2.4m deep lean-to "bull nose" verandah extends along part of the north elevation. A similar 1.2m deep verandah forms a canopy above the entry on the south elevation. An enclosed deck opens from the second floor games room. The deck is set within the lower roof slope and has an open timber balustrade and butyl rubber membrane floor.

2.3 The wall cladding is rusticated weatherboards, with timber facing boards at corners and around the windows. The expert has noted that the weatherboards are untreated Douglas fir. The weatherboards are fixed through the building wrap directly to the framing. An acrylic paint coating has been applied to the weatherboards and facing boards.

2.4 The expert was unable to confirm whether the wall framing is treated, and the specification calls for the framing timber to be "H1" treated. However, given the

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

date of the framing erection in 1998, I am unable to determine the particular level and type of treatment described as "H1". Given the lack of evidence, I consider that the wall framing is unlikely to be treated to a level that will provide resistance to fungal decay if it gets wet and retains moisture.

3. Background

3.1 The authority issued a building consent (No. R416862) on 10 June 1997. The authority carried out various inspections during construction, including a structure and pre-line inspection on 6 January 1999.

3.2 According to the lawyer, a dispute between the original owner and the builder led to construction stopping after the building's structure and the exterior claddings were completed.

3.3 The authority issued an interim CCC to the original owner on 19 October 2000 'in respect of all work satisfactorily inspected to date'. The certificate noted that further work required to be completed and inspected. It appears that the applicant purchased the property in April 2001.

3.4 Apart from a plumbing and drainage inspection on 9 April 2002, I have received no records of any further inspections until the authority carried out a final inspection on 12 June 2007, which identified various cladding items, including some work required to the weatherboards, posts, facings and flashings.

3.5 Following several re-inspections, an inspection on 24 August 2007 confirmed that the outstanding items were complete and noted various documentation required. When this was provided, the applicant applied for a CCC.

3.6 In a letter to the applicant dated 18 February 2008, the authority outlined the durability periods required in the building code and noted that it was unable to issue a CCC because:

> ...as a result of the time lapsed, the Council cannot 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 [CCC] has been issued.

The authority also raised concerns regarding the weatherboard cladding, noting:

> ...our building inspectors have identified over the 10 year plus construction period that the building has only been made completely waterproof in August 2007 with the installation of head flashings, scribers and bungs to the weatherboards. Regular maintenance has not been carried out as evident by the building inspector's instructions to replace areas of cladding showing signs of wear and a rotten verandah post.

3.7 The lawyer made an initial application for a determination on behalf of the applicant on 18 February 2008, with the accompanying letter noting that documentation would follow. The Department received the supporting information on 5 September 2008.

4. The submissions

4.1 In the letter dated 18 February 2008 accompanying the initial application, the lawyer noted that:

> Refusal by the Council to issue a [CCC] was expected, as there had been plenty of prior discussion between the parties. The background issue is that the house started some years ago by a previous owner, then purchased and finished by [the applicant].

4.2 In the letter dated 4 September accompanying the supporting documentation, the lawyer outlined the history of the project, describing the delay in construction and noting:

> For all practical purposes the house is now complete, but the Council is unable to issue a [CCC]. Being unable to verify framing, water tightness and durability, the Council cannot risk issuing a [CCC] which effectively carries a warranty from the date of issue.

4.3 Under cover of the above letters, the lawyer forwarded copies of:

- the drawings and specification
- the consent documentation
- the inspection records
- the interim CCC dated 19 October 2000
- the letter from the authority dated 18 February 2008
- various other producer statements, calculations and information.

4.4 In a letter to the Department dated 15 July 2008 the authority noted that its opinions were as stated in its letter dated 18 February 2008.

4.5 The authority forwarded copies of the same information as supplied by the applicant's lawyer.

4.6 Copies of the submissions and other evidence were provided to each of the parties. Neither the applicant nor the authority made any further submissions in response to the submissions of the other party.

4.7 The draft determination was issued to the parties on 25 November 2008. The draft was issued for comment and for the parties to agree a date when the "building shell", which includes the structure and the exterior claddings, complied with Building Code Clause B2 Durability.

4.8 The authority responded to the draft in a letter to the Department dated 24 December 2008. The authority did not accept the draft, the authority's submission is summarised as follows:

- The draft determination said both that the installation of the weatherboards was generally of a reasonable standard, but also listed faults which appear to have arisen generally from poor workmanship and lack of maintenance. It appeared

that the expert's comments have been taken out of context in that the initial comments were observations as to the quality of finish.

- The draft determination implied the exterior cladding was inspected and approved by the Council as complying with the Building Code as confirmed by the issue of the interim CCC, however the certificate says it is only 'in respect of all work satisfactorily inspected to date'.
- The draft determination deals with the durability and remedial work but not with other aspects of the Building Code. Should the building suffer structural damage, the Council could be exposed to liability.
- The post-line bracing inspection was not carried out; therefore the verification of the structural integrity of the building is in doubt.
- Council does not accept that compliance with Clause B1 has been achieved.
- Council has concerns in respect of its potential exposure to liability in respect of 'the [Department's] practice of "modifying the Building Code" and is therefore reluctant to follow the path set out in the decision.'
- A date error in the draft was also noted.

4.9 I have considered the authority's comments and amended the determination accordingly. However, I note the following:

- In my view the expert's comments on the initial installation of the weatherboards have been described appropriately.
- I acknowledge the authority's comments with respect to the weatherboard cladding not being included in the interim CCC and I have amended the determination accordingly. However, I believe it is reasonable to consider that the weatherboard cladding was substantially complete at about this time (and before the pre-line inspection), and in the normal course of events the cladding's required 15 year durability period should also have commenced at this time.
- The inspection reports carried out after the date of the interim CCC refer to the correction of a limited number of defects to the cladding.
- The authority's letter to the applicant, dated 18 February 2008, (refer paragraph 3.6) only noted that the CCC would not be issued because of the age of the consent and concerns the authority had about the maintenance of the exterior. No other submission was made by the authority in response to the application or the experts report.
- The inspection report dated 6 January 1999 records, amongst other items, that 'All structure and bracing complies'. Under heading 'Work required' the record noted plumbing items to be checked at post-line stage. Six further inspections were completed – of which only one referred to a structural matter, being the replacement of a verandah post.
- In my view the authority originally had no concerns about the structure, and, judging from the inspection records, it has already satisfied itself that the building complies with Clause B1.

4.10 Matters associated with the authority's potential liability are not matters I can determine because they are outside my jurisdiction under the Act. I note that the Department has issued a significant number of determinations within the Authority's jurisdiction that have included a modification of the B2 durability periods.

4.11 With respect to when the building shell complied with Clause B2 Durability, the authority submitted that this was achieved on 16 June 1997; however, this date is only 6 days after the building consent was issued on 10 June 1997.

4.12 The anomaly was pointed out to the authority which in turn suggested that January 1998 would be a more appropriate date, which I have taken to be 1 January 1998. The applicant's lawyer agreed with this date. The date may be conservative, however, it is unclear when the cladding was installed - being some time after the slab inspection in June 1997, and before the pre-line inspection in January 1999.

5. The expert's report

5.1 As discussed in paragraph 1.5, I engaged an independent expert to provide an assessment of the condition of those building elements subject to the determination. The expert is a member of the New Zealand Institute of Building Surveyors. The expert inspected the house on 14 October 2008 and furnished a report that was completed on 12 November 2008.

5.2 The expert noted that the original installation of the weatherboards was generally of a reasonable standard, but the lack of maintenance had resulted in the cladding being in a 'state of bad repair'. The expert noted that the roof and roof flashings appeared acceptable, but the window flashings were in most respects unacceptable.

5.3 The expert noted that the windows and doors were face-fixed over facing boards, with metal head flashings fitted over the top board and extending down over the window flange. The expert removed the sill facing below the laundry window and noted that the jamb was unsealed and the underlying weatherboards were unpainted. As the nail fixings were severely corroded, the expert removed a section of weatherboards at the sill to jamb junction and observed signs of fungal decay in the sill framing, which was confirmed by laboratory analysis.

5.4 The expert also removed corner facings from the bottom of the north east corner, and noted that the underlying weatherboards were unpainted, with 20mm bitumen-impregnated foam inserted into the 20mm to 25mm gap between the boards.

5.5 The expert inspected the interior and exterior of the house, taking non-invasive moisture readings internally, and noted elevated moisture readings below two windows. The expert took nine invasive readings through the cladding below window sills and in bottom plates, and noted the following elevated readings:

- 24% to more than 40% in the framing below the laundry window
- 17% below a toilet window
- 20% in the bottom plate at the cut-out at the northeast corner.

I note that the remaining readings varied between 9% and 14%. Moisture levels that vary significantly generally indicate that external moisture is entering the structure and further investigation is required.

5.6 Commenting specifically on the cladding, the expert noted that:

- there is insufficient clearance from the bottom of the weatherboards to the ground, with the boards penetrating the soil in some areas
- the weatherboards butt against the deck membrane, and the bottom of the boards and facings are decaying
- the weatherboards have been painted only on exposed faces and the paint finish has deteriorated, with bare timber exposed in many areas
- the weatherboards and facings are extensively cracked and split, with corroding fixings, joints that have opened, decay apparent in some areas and rustic plugs missing at some edges of the facing boards
- the mitre joints of the facing boards at the oblique corners have opened and the bitumastic impregnated foam inserted into the gaps between the underlying unpainted weatherboards provides inadequate weather protection
- the head flashings are not sloped to direct water away from the window and the ends of the flashings are not weathertight
- the window jamb flanges are not sealed against the facing boards
- the deck balustrades are fixed through the membrane
- a downpipe is discharging onto the garage roof resulting in water splashing against the bottom of the weatherboards, which are deteriorating.

5.7 The expert also noted that the deck balustrade appeared flimsy and unstable, with deteriorating timber, inadequate skew-nailing into the walls and the outer mitred joints nail-fixed only to the corner posts, with a triangle fillet fixed at one corner in an attempt to strengthen the joint. I consider this as evidence of the balustrade not complying with Clauses B1 Structure and B2 Durability.

5.8 A copy of the expert's report was provided to the parties on 14 November 2008.

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 Solutions[4], 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:

[4] 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.

- Some Acceptable Solutions are written conservatively to 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 one or more other provisions to compensate for that in order to comply with the Building Code.

6.2 Evaluation for E2 and B2 Compliance

6.2.1 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[5] (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.

6.2.2 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.

6.3 Weathertightness risk

6.3.1 The house has the following environmental and design features in relation to its weathertightness profile:

Features that increase risk

- is built in a high wind zone
- is a maximum of three storeys in height
- has no eaves or verge projections to shelter the upper wall areas
- has a second floor enclosed deck set within the roof area
- has weatherboard cladding fixed directly to the framing
- has external wall framing that is unlikely to be treated to a level that is effective in helping resist decay if it absorbs and retains moisture.

Features that decrease risk

- is a fairly simple building, with limited complex junctions
- has verandahs that protect some of the ground floor walls.

6.3.2 The house has been evaluated using the E2/AS1 risk matrix. The risk matrix allows the summing of a range of design and location factors applying to a specific building

[5] Copies of all determinations issued by the Department can be obtained from the Department's website.

design. The resulting level of risk can range from "low" to "very high". The risk level is applied to determine what cladding can be used on a building in order to comply with E2/AS1. Higher levels of risk will require more rigorous weatherproof detailing; for example, a high risk level is likely to require a particular type of cladding to be installed over a drained cavity.

6.3.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 6.3.1 show that all elevations of the house demonstrate a high weathertightness risk rating.

6.3.4 While the current E2/AS1 requires a drained cavity for high risk exposures for this cladding type, the relevant acceptable solution E2/AS1 at the time of construction in 1999 permitted direct-fixed horizontal weatherboard cladding. However, I note that the weatherboard cladding would have needed to incorporate the requirements of NZS 3602 as outlined below.

6.4 The requirements for the weatherboards

6.4.1 The New Zealand Standard that applied at the time that the weatherboards were installed was NZS 3602[6].

6.4.2 The relevant clauses from NZS 3602 include:

> **110 REQUIREMENTS FOR BUILDING COMPONENTS WITH A 15 YEAR DURABILITY**
>
> **110.2.1**
> Unless covered by 110.2.7, weatherboards and exterior finishing timbers shall be primed . . . All surfaces and joints of exterior finishing timbers shall be primed with the exception of those building components which are treated to H3.
>
> **110.2.7**
> For "no finish" or "stained finish" condition only the following species are permitted; redwood, cypress, western red cedar and sawn H3 treated pinus species.

6.4.3 In the case of the cladding to this house, I make the following observations:

- The weatherboards are untreated Douglas fir.
- Table 2 of NZS 3602 states that no treatment is required for "Dressing heart Douglas fir" weatherboards.
- Douglas fir weatherboards do not fall within the timber species that may have "no finish" or a "stained finish" (Clause 110.2.7).
- Douglas fir weatherboards required sealing on all surfaces and joints (Clause 110.2.1).

[6] New Zealand Standard NZS 3602:1995 Timber and Wood-based Products for Use in Buildings

Matter 1: The cladding

7. Discussion

7.1 Taking into account the expert's report, I am satisfied that the current performance of the weatherboard cladding is inadequate because it has not been installed according to good trade practice or to the relevant requirements at the time of construction. In particular, the cladding installation includes the systemic defects listed in paragraph 5.6, resulting in moisture penetration into the walls which may have led to decay in the framing timber. Consequently I am not satisfied that the weatherboard cladding as installed complies with either Clause B2 or Clause E2 of the Building Code.

7.2 Because of the extent and apparent complexity of the faults that have been identified with the cladding, I am unable to conclude how the faults are to be fixed and how the building can be brought into compliance with Clauses B2 and E2.

7.3 I consider that final decisions on whether code compliance can be achieved by either targeted repairs or re-cladding, or a combination of both, can only be made after a more thorough investigation of the cladding. This will require a careful analysis by an appropriately qualified expert. Once that decision is made, the chosen repair option should be submitted to the authority for its consideration and approval.

7.4 I note that the Department has produced a guidance document[7] on weathertightness remediation. I consider that this guide will assist the owner in understanding the issues and processes involved in remediation work and in exploring various options that may be available to them when considering the upcoming work required to the house.

Matter 2: The durability considerations

8. Discussion

8.1 The authority has concerns about the durability, and hence the compliance with the building code, of certain elements of the building taking into consideration the age of those parts of the building completed in or around 1998.

8.2 As outlined in paragraph 3.2, construction of this house stopped after the structure and the exterior claddings were completed. The building remained vacant for some years and it appears that the remaining building work was not completed until 2007. The following therefore applies only to those elements completed and contained in the "building shell", which includes the structure and the exterior claddings.

8.3 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).

[7] External moisture – A guide to weathertightness remediation. The guide is available on the Departments website or in hard copy by calling the Department on 0800 242 243

8.4 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.

8.5 The 9-year delay between the substantial completion of the building shell and the applicant's request for a CCC in 2007 raises the matter of when the elements in the building shell complied with Clause B2. 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 1998.

8.6 It is not disputed and I am therefore satisfied, that all the building elements complied with Clause B2 on 1 January 1998 (refer paragraph 4.12).

8.7 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.

8.8 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 in the building shell.

(b) it is reasonable to grant such a modification, with appropriate notification, because in practical terms the building is no different from what it would have been if a CCC for the building elements in the building shell had been issued in 1998.

8.9 I strongly recommend 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. What is to be done now?

9.1 A notice to fix should be issued that requires the owner to bring the house into compliance with the Building Code, identifying the items listed in paragraph 5.6 and 5.7, and referring to any further defects that might be discovered in the course of investigation and rectification, but not specifying how those defects are to be fixed. It is not for the notice to fix to stipulate directly how the defects are to be remedied

and the house brought to compliance with the Building Code. That is a matter for the owner to propose and for the authority to accept or reject.

9.2 I would suggest that the parties adopt the following process to meet the requirements of paragraph 9.1. Initially, the authority should issue the notice to fix. The owner should then produce a response to this in the form of a detailed proposal, produced in conjunction with a competent and suitably qualified person, as to the rectification or otherwise of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

9.3 Once the matters set out in paragraph 5.6, together with any other matters arising from a more extensive investigation, have been rectified to its satisfaction, the authority may issue a CCC in respect of the building consent as amended.

9.4 I also note the expert's comments in paragraph 5.7, and draw the safety of the second floor deck balustrade to the authority's attention for further investigation as a matter of urgency. This item is not compliant with Clause B1.

10. The decision

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

- the second floor deck balustrade does not comply with Building Code Clauses B1 and B2
- the cladding as installed to the building does not comply with Building Code Clause B2

and accordingly I confirm the authority's decision to refuse to issue a CCC.

10.2 I also determine that:

(a) all the building elements installed in the building shell only, apart from the items that are to be rectified as described in this determination, complied with Clause B2 on 1 January 1998.

(b) the building consent is 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 1998 instead of from the time of issue of the code compliance certificate for all the building elements in the building shell, with the exception of the defects noted in paragraph 5.6 and 5.7 of determination 2009/40.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 4 June 2009.

John Gardiner
Manager Determinations