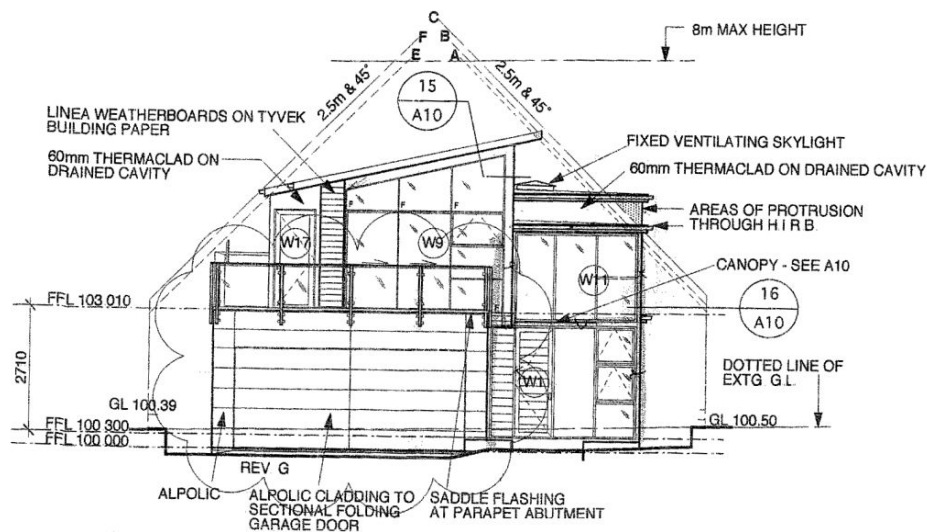


Determination 2006/55

Refusal to approve installation of aluminium-faced panel cladding at 14 Rangitoto Terrace, Milford



1. The dispute 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, John Gardiner, Determinations Manager, Department of Building and Housing, for and on behalf of the Chief Executive of that Department. The applicant is Mr Singh of Santa Barbara Project Management (“the applicant”) who is acting on behalf of the owners, and the other party is the North Shore City Council (“the territorial authority”).
- 1.2 The dispute for determination is whether the territorial authority’s decision to decline approval of the installation of aluminium cladding for this partly constructed house because it was not satisfied that the cladding design complied with clauses B2 “Durability” and E2 “External Moisture” of the Building Code² (First Schedule, Building Regulations 1992) is correct.
- 1.3 The question to be determined is whether I am satisfied on reasonable grounds that the proposed aluminium-faced panel cladding system to some of the walls of this building (“the cladding”) will comply with the Building Code (see sections 177 and 188 of the Act). By “the cladding” I mean the components of the system (such as the panels, the fixings, the flashings and the joints) as well as the way the components

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

have been installed and work together. I note that the territorial authority has not referred to the remaining areas of cladding as being a matter of dispute for determination. Accordingly consideration of them does not form part of this determination.

- 1.4 In making my decision, I have considered the submission of the applicant and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 5.1. I have not considered any other aspects of the Act or the Building Code.

2. The building

- 2.1 The building is a 2-storey detached house situated on a stepped and excavated site that is in a medium wind zone for the purposes of NZS 3604³. Construction is generally conventional light timber frame, with a concrete slab and foundations and aluminium windows. The house is a fairly simple shape, with a 12.5° profiled metal monopitch roof and clerestorey windows above two flat membrane roof sections. Monolithic “Insulclad” over a cavity is used on most walls of the house, with fibre cement “linear” weatherboards to some upper walls and aluminium-faced panels cladding to several lower walls.
- 2.2 A membrane-covered deck is situated above part of the garage area. The garage walls below the deck are partly clad in Insulclad, which extends up to form the deck balustrade. The remaining garage walls below the deck are to be clad with aluminium-faced panels, with open metal and glass deck balustrades above.
- 2.3 The applicant has submitted a copy of an invoice and letter from the timber supplier indicating that the timber supplied for the wall framing was H1.2 treated with bottom plates H3.1 treated. Based on this evidence, I consider that the external wall framing used on the house is H1.2 treated with bottom plates H3.1 treated.
- 2.4 The cladding system that is the subject of this determination is the aluminium-faced panel cladding to part of the garage walls, and is an “Alpolic” system comprising 416 mm high aluminium faced composite panels that have varying lengths. The panels, which include returns at the edges, are supported by hidden metal brackets. The support brackets are fixed through uPVC washers and the building wrap to the wall framing. The fixing system provides a continuous drained cavity of varying depth behind the panel edge returns, with 25mm to 30mm between the outer panel face and the framing. The resulting cavity down the wall is therefore about 25mm at the body of the panel; with about 5mm at the edge joins. Drainage holes are provided at the horizontal return at the bottom of the cladding.
- 2.5 The cladding supplier, Aluminium Technology Ltd., has provided a “Producer Statement” and a 15-year “Product Guarantee” dated 30 November 2005, for the “Alpolic” system.

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

3. Sequence of events

- 3.1 Construction of the house took place during 2005 and I understand that the building is almost complete, with the exception of some minor items. I have received no evidence of what inspections were undertaken by the territorial authority.
- 3.2 In a “Building Officers Field Memorandum” dated 27 September 2005, the territorial authority informed the applicant that amended plans and junction details must be provided for the aluminium-faced panel cladding as:
- Alpolic panels to be fixed over a 20 mm drained and vented cavity as per E2/AS1 third edition methodology.
- 3.3 An application for a Determination in regard to the Alpolic cladding system was received by the Department on 11 November 2005.

4. The submissions

- 4.1 The applicant noted in the application that the “Matter of doubt or dispute” is that:
- The building has been partially clad with composite cladding material (Alpolic). This product has a system of fixing that provides a 20 mm cavity. We do not believe that battens are required.
- 4.2 The applicant forwarded copies of:
- some of the drawings
 - the “Building Officers Field Memorandum” from the territorial authority
 - some details and specifications on the Alpolic cladding system
 - various other statements.
- 4.3 The territorial authority made no submission.
- 4.4 Copies of the applicant’s submission and other evidence were provided to the territorial authority, which made no submission in response.
- 4.5 A copy of the draft determination was forwarded to the parties on 20 March 2006. The applicant accepted the draft.
- 4.6 The territorial authority responded to the draft determination on 17 May 2006 noting a number of areas where the panel system as installed on the house differed from the manufacturer’s installation details. In order to clarify the general dimensions of the panel system used in this house, the Department commissioned an independent expert (“the expert”) to inspect the panelling.

- 4.7 The expert inspected the system on 24 May 2006 and submitted a report dated 29 May 2006. Based on this report, I have amended the determination as I consider appropriate.

5. Evaluation for code compliance

5.1 Evaluation framework

- 5.1.1 There are no Acceptable Solutions that have been approved under section 22 of the Act that cover this aluminium-faced panel cladding system. The cladding is not currently certified under section 269 of the Act. I am therefore of the opinion that the proposed cladding system must be considered to be an alternative solution.
- 5.1.2 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solution⁴, which in this case is E2/AS1, which will assist in determining whether the proposed aluminium-faced panel cladding system will be 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.
- 5.1.3 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 (refer to Determination 2004/1 *et al*) relating to cladding and these factors are also used in the evaluation process.
- 5.1.4 The consequences of a building, or a part 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 the quality of its installation to be carefully carried out.

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.

5.2 Weathertightness risk

5.2.1 The aluminium-faced panel cladding system that is the subject of this determination is confined to three wall faces, which can be considered separately from other walls, as they form a limited and distinct part of the building.

5.2.2 In relation to the characteristics discussed in paragraph 5.1.3, I find that the section of the building to be clad with the proposed cladding:

- is built in a medium wind zone
- is a maximum of one storey high
- is simple in plan and in form
- is proposed to have aluminium-faced panel cladding which is fixed over a 15 mm drained cavity, which provides some additional protection to the framing
- has external wall framing that is treated, so providing some resistance to the onset of decay if the framing absorbs and retains moisture.

5.2.3 When evaluated using the E2/AS1 risk matrix, these weathertight features show that the section of the building to be clad with the proposed cladding demonstrates a low weathertightness risk. 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.

5.3 Weathertightness performance

5.3.1 As E2/AS1 makes clear, there are circumstances where the combination of risk factors applying to a particular building, or part of a building, on a particular site, may mean that the building will perform satisfactorily, and therefore be code compliant, without a drained and ventilated wall cavity. It is essential that buildings be considered on a case-by-case basis, as the Act requires, ensuring that all the circumstances are properly considered.

5.3.2 I note that the Alpolic cladding has some capacity to facilitate drainage and drying via the 5 to 25mm cavity behind the aluminium panels, but I do not have grounds to form a view that the drainage and drying thus provided is equivalent to that provided by a 20 mm drained cavity as specified in E2/AS1. However, while the Alpolic panel cladding is of a type that is not specifically described in E2/AS1, I consider it helpful to make a comparison between its likely weathertightness performance and that of the most comparable cladding described in E2/AS1.

5.3.3 As the Alpolic panel edges at joint positions are limited to the thickness of the panel material, I consider that the relevant characteristics of this cladding may be

compared to those of vertical profiled metal cladding, as specified in E2/AS1. Within the scope of E2/AS1, I note that vertical corrugated metal cladding:

- may have crest heights as low as 16.5mm
- will touch the building wrap at trough positions
- will be fixed through the building wrap to the wall framing at dwang positions
- does not require a drained cavity

5.3.4 When considering comparable factors to those noted in paragraph 5.3.3 for the proposed Alpolic panels, I note that this cladding:

- has crest heights (between the rebated panel edges) of about 25mm
- will not touch the building wrap at panel joint positions (except at brackets)
- is supported by brackets fixed through packers over the building wrap to the wall framing
- has a drainage plane of about 5mm behind the panel joints
- has provision for drainage via holes in the panels at the base of the walls
- is to be fixed to wall faces assessed as being of low weathertightness risk

5.3.5 When comparing the features noted in paragraph 5.3.3 with those in paragraph 5.3.4, I consider that the weathertightness performance of the Alpolic panels as proposed for this building is likely to be at least equivalent to that of vertical corrugated metal wall cladding as specified in E2/AS1.

5.3.6 I accept that the Alpolic manufacturer has produced a set of standard details and installation instructions, which appear to be detailed to cover a variety of situations. If the proposed aluminium-faced panel cladding system is then installed as designed, the cladding system can reasonably be expected to exclude moisture from the external walls of this building and thus lead to compliance with clause E2, and if properly maintained, clause B2.

5.3.7 In the case of this building, I have no record of what inspections may have been carried out to date by the territorial authority. It is in the interests of all the parties to ensure that inspections of work critical to the eventual compliance of the building with the building code are specified by the territorial authority and carried out at critical stages in the construction.

5.3.8 Notwithstanding the fact that the proposed aluminium-faced panel cladding system has a drained cavity which is less than 20 mm in depth in some positions, I have noted certain compensating factors that may assist the performance of the proposed cladding in this particular case:

- the section of the building using the proposed aluminium-faced panel cladding is simple, with no complex junctions
- the proposed aluminium-faced panel cladding has some capacity to facilitate drainage and drying via the continuous 5 to 25mm cavity behind the panels.
- the external walls of this building have framing that is treated to a level that will provide some resistance to the onset of decay if the framing absorbs and retains moisture.

5.3.9 I consider that these factors will help compensate for the lack of constant depth in the drained cavity and can assist the building to comply with the weathertightness and durability provisions of the Building Code.

5.3.10 I also note that if the items noted in paragraphs 5.3.6 and 5.3.7 are satisfactorily attended to, further compensating factors will be provided that should assist the performance of the proposed aluminium-faced panel cladding in this particular case. These further factors would be:

- thorough documentation, to be submitted to the territorial authority for approval, which shows how the junctions and penetrations for the proposed cladding are to be constructed
- thorough inspections during the installation of the wall cladding to ensure that junctions and penetrations are constructed in accordance with those approved details.

6. Conclusion

6.1 There are some factors in the case of the proposed aluminium-faced panel cladding to a part of this building, as outlined in paragraph 5.3.8, which can assist the proposed cladding system to comply with the weathertightness and durability provisions of the Building Code.

6.2 I note that effective maintenance of claddings is important to ensure ongoing compliance with clause B2 of the Building Code. That maintenance is the responsibility of the building applicant. The code assumes that the normal maintenance necessary to ensure the durability of the cladding is carried out. For that reason clause B2.3.1 of the Building Code requires that the cladding be subject to “normal maintenance”. That term is not defined and I take the view that it must be given its ordinary and natural meaning in context. In other words, normal maintenance of the cladding means inspections and activities such as regular checking, cleaning, replacing sealants, and so on.

6.3 It is emphasised that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular cladding system has been established as being code compliant in relation to part of a particular building does not necessarily mean that the same cladding system will be code compliant in another situation.

6.4 In the circumstances, I decline to incorporate any waiver or modification of the Building Code in this determination.

7. The decision

7.1 In accordance with section 188 of the Act, I determine that there are reasonable grounds to suppose that the proposed aluminium-faced panel cladding system to some of the external walls of this building, if carefully completed in accordance with the manufacturer's instructions, and if subject to careful maintenance, will comply with the requirements of clauses B2 and E2 of the building code.

7.2 I find that because of the compensating factors in this case, the lack of a full 20 mm drained cavity behind the proposed aluminium-faced panel cladding is not, on its own, sufficient grounds to refuse to issue approval of the cladding.

7.3 Finally, I consider that the proposed cladding system will require on-going maintenance to ensure its continuing code compliance.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 14 June 2006.

John Gardiner
Determinations Manager