

Determination 2008/53

Refusal of a territorial authority to issue an amended building consent in respect of a monolithic cladding at 35 Island View Drive, Gulf Harbour, Whangaparaoa



1. The matter to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the Act”) made under due authorisation by me, 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 of the building, K M Holyoake (“the applicant”) and the other party is the Rodney District Council (“the territorial authority”)
- 1.2 This determination arose from the territorial authority’s decision to refuse to issue an amended building consent for a Hitex Diamond cladding system (“the cladding”) installed by the applicant that was different from the cladding specified in the building consent. The territorial authority refused to amend the consent because it did not believe the cladding complied with Clause E2 “External Moisture” and Clause B2 “Durability,” of the Building Code² (Schedule 1, 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.

- 1.3 The applicant originally stated that the matter for determination was whether the cladding as installed on this house complies with the Building Code. At the hearing the applicant sought to amend this to whether the cladding in general terms, and not specifically as installed in this instance, complied with the Building Code. No legal submissions were made in support of the amendment to the matter for determination and whether it is covered in Section 177 of the Act.
- 1.4 Sections 177(a) and 177(b)(i) of the Act say that:
- A party may apply to the chief executive for a determination in relation to 1 or more of the following matters:
- (a) whether particular matters comply with the building code:
- (b) a building consent authority's decision to
- (i) issue, or refuse to issue, a building consent...
- 1.5 I take the view that “whether particular matters comply with the building code” applies to a particular building and does not apply to the general compliance of a building product or system. I take the view that the system of product certification prescribed in the Act is the system Parliament intended to be used to obtain a general approval of the cladding.
- 1.6 Accordingly, the determination will be confined to matters to do with the cladding as installed on the house. Therefore, the matters to be determined are:
- whether the cladding as installed to the upper floor of the house complies with Building Code Clauses E2 and B2
 - whether the decision of the territorial authority to refuse to issue an amendment to the building consent is correct.
- 1.7 By “the 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.
- 1.8 In making my decision, I have considered the submissions of the parties, including the arguments, material and demonstrations presented at the hearing. I have evaluated this information using a framework that I describe more fully in paragraph 7.1.
- 1.9 In making this determination I have not considered any other aspects of the Act or the Building Code. Unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

2. The building

- 2.1 The building work consists of a two-storey in part, detached house under construction, situated on a sloping site adjacent to a cliff edge reserve. The site is in a very high wind zone for the purposes of NZS 3604³. The lower story of the house is constructed of concrete filled polystyrene block walls on concrete slab foundations. The upper storey is of light timber frame construction. The house is moderately complex with a conventional tile roof with 450mm, or larger, eaves and

³ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

has a number of roof to wall joints. Experience has shown that such joints are particularly prone to failure if not executed well.

- 2.2 The two wall systems have different cladding and finish systems. On the ground floor, polystyrene blocks are plastered with a modified reinforced plaster system. In two locations the polystyrene blocks extend up to make two feature walls which are two storeys high. Above these two walls are narrow eaves. The cladding is applied to the remainder of the upper level and is finished with a modified reinforced plaster system, similar to that applied to the polystyrene blocks (the polystyrene blocks are not part of the matter to be determined). The cladding extends down both storeys on a feature wall to the staircase on the east elevation.
- 2.3 The cladding is a form of EIFS⁴. The main point of difference is that grooves are cut in the rear face of the 80mm thick polystyrene sheets to provide ventilation and drainage. The grooves to the polystyrene are approximately 12mm wide x 15mm deep, in a vertical diamond pattern covering approximately 60% of the surface of the rear face of the polystyrene.
- 2.4 The detail drawings for the cladding show the timber framing to the external walls to be treated to H1.2.

3. Background

- 3.1 The territorial authority issued a building consent ABA-62244/A, which I have not seen, based on another EIFS system which incorporated a 20mm cavity system behind the cladding. The building consent was issued under the Building Act 2004. Construction then commenced on the house.
- 3.2 Subsequently the applicant applied for an amendment to the building consent in order to use the cladding.
- 3.3 The territorial authority declined to issue the amendment on the basis that a cavity was required and that the cladding, with its drainage and ventilation grooves, is not equivalent to a cavity as described in E2/AS1. There were also some other minor details that the territorial authority required, but these do not now appear to be in dispute.
- 3.4 The territorial authority said:

[It was] prepared to reconsider this position if presented with an independent assessment of the drying and ventilation requirements together with a consideration of an appropriate upper risk matrix score.
- 3.5 The territorial authority also asked the applicant to supply amended plans to show the detail changes that would be required to construct the house using the cladding in place of the approved EIFS system. I have been shown no evidence that amended plans have been supplied to the territorial authority.
- 3.6 In a letter to the applicant dated 5 September 2007 the territorial authority said it would refuse the application for amendment of the consent in the absence of the items described in paragraphs 3.5.

⁴ External Insulation & Finish System

3.7 I am advised that although the house is described in the application for determination as being under construction, the cladding has been installed and the work is in effect complete.

3.8 The Department received the application for a determination on 20 December 2007.

4. The submissions

4.1 The applicant made a submission in the form of a letter dated 10 January 2008. This discussed various technical aspects of the cladding and how it was comparable to a cladding system with a 20mm cavity.

4.2 The applicant forwarded copies of:

- the drawings (not stamped as consent drawings)
- cladding and exterior joinery details
- photographs of the work in progress.

4.3 The territorial authority made a submission in a letter dated 4 January 2008. This outlined the territorial authority's view of why the cladding did not have the equivalent of a "standard 20mm cavity" and why it declined to issue an amended consent.

4.4 Copies of the submissions and other evidence were provided to the parties. Neither party made any further submissions in response to the information that was provided.

4.5 A copy of the draft determination was sent to the parties for comment on 25 February 2008. Subsequently the applicant accepted the draft with non contentious amendments but the territorial authority did not accept the draft, because, in its opinion, the cladding is not in accord with E2/AS1 and is not supported by an independent assessment. I discuss this matter in paragraph 9.

4.6 The applicant also forwarded a copy of his submission to the territorial authority in support of the application for an amendment to the building consent. I have taken that submission into account in drafting this determination.

4.7 Following a hearing (refer paragraph 5) a second draft determination was sent to the parties for comment on 30 April 2008. Comments were received from the applicant in a letter dated 20 May 2008. Comments from the territorial authority were received by email dated 11 June 2008. I have considered those comments and modified the determination as I consider appropriate.

5 The hearing

5.1 A hearing was held at the request of the applicant to present further information regarding the performance of the cladding. The hearing was held before me on 7 April 2008. It was attended by the applicant, the manufacturer of the cladding, and a consultant. The territorial authority was represented by two of its officials. I was accompanied by a Referee engaged by the Chief Executive under section 187(2) of the Building Act 2004. Two staff members of the Department also attended.

5.2 An outline of the research work that had been carried out by the manufacturer, and collaboratively with Auckland University, was presented. It was acknowledged that

while some of the work had not been completely independently verified all work on the drying capacity of the proprietary cavity tended to show consistent trends and results that show the system does not absorb significant moisture and will facilitate drying. No comparison with houses with other cladding systems was shown to me.

- 5.3 A simple test was demonstrated where three litres of water were poured into the top of two test walls, one wall with the cladding and the other wall with a 20 mm battened cavity and fibre-cement sheet. A greater quantity of water drained from the cladding than from the wall with the 20mm cavity in the time I observed the test. The drainage test is discussed further in paragraphs 9.7 and 9.8.
- 5.4 A report by an independent consultant was submitted in the documentation supplied by the applicant. The report took the form of a review of research work done on the cladding. The consultant reviewed drainage and drying research and tests, and also reviewed moisture content monitoring of some houses that had been built using the same cladding. The consultant concluded that the system provides both drainage and drying and, as an alternative solution, can meet the performance requirements of Building Code Clause E2
- 5.5 In addition, information was presented at the hearing in the form of records obtained from 25 houses clad with the same cladding. The information was in the form of drying records obtained from moisture detection units installed in the lower wall plates of the external walls. The most significant were records from new houses which showed high levels of moisture when first built, but which dried out in 1 to 2 months. I accept that these records show that the construction moisture levels declined over time, but no evidence was produced to show that such results were better or worse than those that might be obtained from other new houses built with other cladding systems.

6 The legislation

- 6.1 The relevant parts of Building Code Clause E2 External Moisture include:
- E2.3.2 Roofs and exterior walls must prevent the penetration of water that could cause undue dampness, damage to building elements, or both.
 - E2.3.3 Walls, floors and structural elements in contact with, or in close proximity to, the ground must not absorb or transmit moisture in quantities that could cause undue dampness, damage to building elements, or both.
 - E2.3.4 Building elements susceptible to damage must be protected from the adverse effects of moisture entering the space below suspended floors.
 - E2.3.5 Concealed spaces and cavities in buildings must be constructed in a way that prevents external moisture being accumulated or transferred and causing condensation fungal growth, or the degradation of building elements.
 - E2.3.6 Excess moisture present at the completion of construction, must be capable of being dissipated without permanent damage to building elements.
 - E2.3.7 Building elements must be constructed in a way that makes due allowance for the following:
 - (a) the consequences of failure;
 - (b) the effects of uncertainties resulting from construction or from the sequence in which different aspects of construction occur:

- (c) variation in the properties of materials and in the characteristics of the site

6.2 The relevant parts of Building Code Clause B2 Durability include:

- B2.3.1 Building elements must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the specified life of the building, if stated, or:
- (a) . . .
- (b) 15 years if:
- (i) Those building elements (including the building envelope, exposed plumbing in the subfloor space, and in-built chimneys and flues) are moderately difficult to access or replace, or
- (ii) Failure of those building elements to comply with the building code would go undetected during normal use of the building, but would be easily detected during normal maintenance.
- (c) . . .
- B2.3.2 Individual building elements which are components of a building system and are difficult to access or replace must either:
- (a) All have the same durability, or
- (b) Be installed in a manner that permits the replacement of building elements of lesser durability without removing building elements that have greater durability and are not specifically designed for removal and replacement.

7. Evaluation for code compliance

7.1 Evaluation framework

7.1.1 In evaluating the design of a building it is common practice to make comparisons with the relevant Acceptable Solution⁵, in this case E2/AS1, which will assist in determining whether the features of this house are code compliant. Compliance with E2/AS1 is not a mandatory requirement under the Building Code, so if any detail is not in accord with E2/AS1 that does not mean that it does not comply with the Code. In making a comparison with E2/AS1, the following general observations are valid:

- 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.
- When there is non-compliance with one provision of an Acceptable Solution a process is required to evaluate the building as an alternative solution. It will then be necessary to look for one or more other provisions to compensate for that in order to comply with the Building Code.

7.1.2 While comparison with an Acceptable Solution is one way to assess compliance it is important that such a process should not be seen as the only way. An alternative approach to that described in paragraph 6.1 above is to consider what the Building Code requires and to evaluate building work against those requirements. This

⁵ 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.

approach recognises that while E2/AS1 is an Acceptable Solution it is not mandatory, unlike the Building Code requirements which are mandatory.

- 7.1.3 In this case, as the house is effectively completed, I can take account of what has been built, as well as considering the drawings and specifications, in deciding whether the building work that is subject to this determination is compliant with the Building Code Clauses in paragraphs 6.1 and 6.2.
- 7.1.4 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to consider in the first instance the quality of what has been built and secondly, to what extent the principles of weathertightness have been demonstrated. This involves consideration of the design of the building, the surrounding environment, the design features that are intended to prevent the penetration of water, the cladding system and its features (e.g. the joinery flashing details), its installation, and the moisture tolerance of the external framing. The capacity of the cladding system to allow any moisture that may penetrate the cladding to drain the moisture away and allow the wall to dry is also part of this consideration. The Department and its antecedent, the Building Industry Authority, have also described weathertightness risk factors in previous determinations⁶ (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.
- 7.1.5 I consider it is reasonable to take into account the extent to which the building work has been subject to quality control procedures and the extent to which it is possible to be confident that those procedures are adequate and have been faithfully observed. The presence of good quality control procedures can tend to diminish the risk of failure of those parts of a building subject to those procedures.
- 7.1.6 The consequence 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 and the extent of compliance will significantly depend on the demonstrated quality of construction and finish.

7.2 Weathertightness risk

7.2.1 In relation to these characteristics I find that this house:

- is built in a very high wind zone
- is a maximum of two storeys high
- is moderately complex in plan and form
- includes a number of high risk roof-wall junctions on the upper story
- has eaves that provide good protection to all walls except the two-storey block feature walls
- generally has cladding with grooves on the reverse face, fixed to the framing to all walls in the upper storey. There is plastered block-work to the ground floor and in some locations that extends to the upper storey

⁶ Copies of all determinations issued by the Department can be obtained from the Department's website.

- has external wall framing that is treated to a level that provides resistance to the onset of decay if the framing absorbs and retains moisture (ie treated as required to meet current Building Code requirements).

8 Is the cladding system an acceptable solution?

- 8.1 E2/AS1 prescribes a 20mm cavity to be installed behind an EIFS system in situations in which there is a moderate or greater weathertightness risk. As the cladding does not have a 20mm cavity it is apparent that it falls outside those claddings described in E2/AS1. However, that does not invalidate the use of the risk matrix in E2/AS1 as a means of assessing, on a comparative basis, the relative level of risk in which the cladding system is to be used, or, as in this case, has been used. When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 7.2.1 show that, with the exceptions of the feature walls, the elevations of the house demonstrate a moderate to high weathertightness risk.
- 8.2 As the cladding does not fall within E2/AS1 it cannot be considered an Acceptable Solution, and by definition it must be considered an alternative solution.

9 Evaluation as an alternative solution

- 9.1 As outlined in paragraph 7.1.1, one approach to take when a cladding system does not comply with some aspects of E2/AS1 is to identify those aspects of the proposed system that do not comply with E2/AS1, and then to consider whether there are any features in the proposed system that would compensate for that non-compliance. In this case the non-compliant detail is the use of the grooves to the rear face of the polystyrene sheet in place of a 20mm cavity system. In most other respects the cladding uses similar weathertightness details to that described in E2/AS1.
- 9.2 I must therefore consider the weathertightness aspects of the cladding, the quality control associated with the installation and standard of finish achieved and how these, together with the drainage and ventilation grooves, may compensate for the lack of a 20mm battened cavity or provide a similar performance to it.
- 9.3 I have received no submission suggesting that the cladding has been installed on this house to anything other than good trade practice or in accordance with the manufacturer's recommendations. Information supplied indicates kick out flashings to the high risk roof wall junctions have been installed to good trade practice.
- 9.4 As noted in paragraph 7.1.2 a valid alternative to the procedure described in paragraph 7.1.1 is to assess the proposed system against the mandatory requirements of the relevant Building Code clauses.
- 9.5 In my view, in order to comply with Clause E2, a cladding system must prevent the penetration of moisture that could cause undue dampness or damage (Clause E2.3.2), but must, in the event that water does penetrate the cladding, provide for that moisture not to accumulate or transfer to building elements so as to cause condensation, fungal decay or degradation of building elements (Clause E2.3.5).
- 9.6 I have been presented with no evidence to suggest that the cladding, as installed on this house, has failed to prevent the penetration of moisture.

- 9.7 The test demonstrated at the hearing only established that most of the quantity of water introduced quite quickly to the top of the wall will escape from the bottom of the wall without much delay, and that some water was apparently absorbed by the timber battens in the battened cavity system.
- 9.8 Both the tested claddings provided for the immediate drainage of most water that might penetrate the cladding. The demonstration also showed that a small but unmeasured quantity of water was absorbed into the timber framing and some may have been retained between the cladding and the framing. As the test apparatus used an impervious plastics layer in place of the normal building wrap, and involved a considerable quantity of water being poured into the wall quite quickly, the test did not simulate very closely a real life installation in which external water is more likely to be entering in smaller quantities but over variable periods of time and at variable frequencies.
- 9.9 That leaves the matter of whether the system provides for the moisture not to accumulate or transfer to building elements so as to cause condensation, fungal decay or degradation of building elements (Clause E2.3.5, refer paragraph 9.5 above).
- 9.10 The evidence presented to me suggests that the cladding system may allow the accumulation of external moisture or its transfer to building elements, although whether that would be to an extent that would cause condensation, fungal decay or degradation of building elements is not yet established. I have been presented with evidence that construction moisture dries out from the adjacent elements, such as the timber studs, within a few months of completion. I observe that construction moisture may not be comparable in this context with moisture that has penetrated the cladding. Clause E2 is concerned with external moisture as well as construction moisture.
- 9.11 Despite the considerable amount of documented material submitted to me, I have not yet been presented with independently reviewed evidence that clearly demonstrates the performance of the cladding system in dealing with the matter of accumulation or transfer of moisture that may penetrate the cladding, as compared with a 20mm battened cavity.

10 Compliance with the building consent and the provision of as built drawings

- 10.1 This house is consented under the Building Act 2004, and therefore section 94(1)(a) of the Act applies. The relevant parts of Section 94 says:
- (1) A building consent authority must issue a code compliance certificate if it is satisfied, on reasonable grounds,
 - (a) that the building work complies with the building consent; and . . .
- 10.2 The house has been built other than in accordance with the building consent and the territorial authority is unable to issue the code compliance certificate unless the building consent is amended to match the work as built. By proceeding to construct the house without having obtained an amendment to the original consent the applicant is at risk of not obtaining a code compliance certificate.

- 10.3 The applicant's only way to achieve compliance of the building work with the building consent will be for the consent drawings to be amended so as to make an accurate set of "as-built" documents.
- 10.4 Plans submitted in support of a building consent, or an amendment to a consent, should always provide sufficient information to show the territorial authority, and the builder, how compliance is to be achieved and to show how joints, intersections and other details are to be constructed. Detail drawings should be cross-referenced to the relevant plans, elevations or sections.

11 Discussion

- 11.1 Both the territorial authority and the applicant have expressed, in detail, differing views on the effectiveness of the drainage and ventilation of the cladding compared to a standard 20mm cavity.
- 11.2 Both parties are of the opinion that the house has a high rating on the weathertightness risk matrix and that this is significant with respect to the compliance of the house. In my view the rating is moderate for the cladding and high for the feature wall but that is only one factor that might be considered under the circumstances.
- 11.3 I have taken account of the evidence submitted by the parties concerning this house. I note the absence of any evidence to suggest that the cladding has not been installed in accordance with the manufacturer's instructions and subject to the manufacturer's quality control procedures described in paragraph 7.1.5. I also note that the territorial authority has not suggested or produced any evidence in its submission to suggest that the building does not comply with Clauses E2 and, consequently, B2 of the Building Code. Consequently I have formed the view that this house, with the cladding as installed, complies with the Building Code
- 11.4 Until the consent documentation is amended to reflect the as built work, the building does not comply with the building consent and is ineligible for a code compliance certificate.
- 11.5 Until the documentation requested by the territorial authority (refer paragraph 3.5) has been supplied, the territorial authority is justified in refusing to amend the consent. However, taking account of the circumstances of this particular case, including the absence of any evidence that the cladding is not working well, the territorial authority shall waive the requirement for the independent assessment described in paragraph 3.4.
- 11.6 The matter of the cladding system having been installed in the absence of an amendment to the original building consent is a matter for the territorial authority to consider. The fact that the house has been determined to be compliant with Clauses E2 and B2 of the Building Code does not amount to an endorsement of the decision by the applicant to carry out building work without prior approval by the territorial authority.
- 11.7 I emphasise 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 a particular building does not necessarily mean that the same cladding system will be code compliant in another situation.

12 The Decision

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

- the cladding on this house complies with the requirements of Clauses E2 and B2 of the Building Code
- the decision of the territorial authority to refuse to issue an amendment to the building consent is confirmed.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 25 June 2008.

John Gardiner
Manager Determinations