Determination 2007/29

Determination regarding a notice to fix for alterations and additions to a house at 75A Waiatarua Road, Remuera, Auckland

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, Determinations Manager, Department of Building and Housing ("the Department"), for and on behalf of the Chief Executive of that Department. The applicants are the owners, C R Hart and N L Faigan, acting through a firm of architects ("the applicants") and the other party is the Auckland City Council ("the territorial authority").

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

1.2 This determination arises from the decision of the territorial authority to refuse to issue a code compliance certificate for the first stage of 14-year old lower floor alterations and additions to a house ("the basement alterations") because it is not satisfied that the building work complies with the following clauses of the Building Code[2] (First Schedule, Building Regulations 1992):

- B1 "Structure"
- B2 "Durability"
- E1 "Surface Water"
- E2 "External Moisture"
- E3 "Internal Moisture"
- G13 "Foul Water"
- H1 "Energy Efficiency"

1.3 As described in paragraph 1.2, the territorial authority's submissions raise matters concerning some 7 clauses of the Building Code. However, from my reading of the correspondence between the parties, I am of the opinion that only matters relating to clauses B2 and E2 remain to be resolved. With respect to E2, the applicants have queried whether a full re-cladding of the basement area, which was originally suggested by them, is necessary. Accordingly, I consider that the matters to be determined are whether:

Matter 1: The cladding

the cladding as installed on the basement alterations ("the cladding") complies with clauses B2 and E2. By "the cladding as installed" I mean the components of the system (such as the backing materials, the flashings, the joints and the plaster and/or the coatings) as well as the way the components have been installed and work together.

Matter 2: The durability considerations

the building elements listed on the notice to fix dated 7 June 2005 comply with clause B2, taking into account the age of the building work.

1.4 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. As regards the cladding, I have evaluated this information using a framework that I describe more fully in paragraph 6.1.

1.5 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.

2. The building

2.1 The building work consists of basement alterations and additions to a detached house situated on an excavated sloping site, which is in a low wind zone for the purposes of NZS 3604[2]. The entire altered house is three storeys high and is relatively complex in plan and form. The external wall construction is either concrete blockwork or conventional light timber frame constructed on timber-framed floors. The pitched roofs have no eaves projections but there are 450mm wide verge projections to two elevations. A timber-framed deck is constructed at two adjoining elevations at ground level.

2.2 According to the expert, the external wall framing timber is likely to be H1 Boric treated.

2.3 Two elevations of the basement alteration have external blockwork walls and the other two elevations generally have timber-framed walls lined with 5-ply plywood fixed directly to the framing over the building wrap. Both the blockwork and the plywood are finished with a mesh-reinforced rough-texture three-coat plaster system. This is made up of a 12mm thick bonding coat, a 17mm thick flanking coat, and a 2-3mm thick finishing coat. The plaster is finished with a high-build paint system. As there is no visual evidence of decay in the plywood backing, the expert considers that the plywood is likely to have some level of treatment. I note that the plywood backing differs from the "Triple S" substrate indicated on the consented plans.

2.4 I have not received any warranties or producer statements relating to the cladding.

3. Sequence of events

3.1 A building consent, No. HC/93/01121, ("the first consent") was issued by the territorial authority on 26 April 1993 for the first stage of the alterations. This work included a new playroom, a garage, a small bathroom and a hall. The building work proceeded but after the basement had been completed the work was halted.

3.2 In May and June 1993 and in May 2005, the territorial authority carried out three inspections of the work covered by the first consent.

3.3 New plans for the ground and first floors, based on the original design, were submitted to the territorial authority in 1999. A second consent, No. AC/99/01070, ("the second consent") was issued for this design and a code compliance certificate was issued for the second consent in 5 December 2000.

3.4 A final inspection of the basement alterations was also carried out on 11 May 2005. The "Final checklist" relating to this last inspection commented on certain matters. One comment stated that the monolithic cladding without a cavity was to be assessed, and another noted that the cladding lacked a cavity.

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

3.5 In a letter to the applicants dated 19 May 2005, the territorial authority noted that there were a number of outstanding matters relating to the first consent.

3.6 The territorial authority undertook a further inspection of the work covered by the first consent on 26 May 2005 and in a letter to the applicants of 7 June 2005, advised them that the territorial authority was not satisfied that the building work complied with the Building Code.

3.7 The territorial authority attached a notice to fix to this letter, which was also dated 7 June 2005. The "particulars of contravention or non-compliance" set out in the notice listed requirements under the following headings:

2.0 Issues relating to cladding

3.0 Other building related issues

4.0 Durability issues

The notice also stated that the applicants were to address the contraventions and, with respect to the durability issues, the applicants were required to engage a recognised building expert to prepare a proposed scope of works. Alternatively, the applicants could apply to the Department for a determination.

3.8 The applicants engaged a firm of architects ("the architects") to inspect the property and prepare a response to the notice to fix. The architects prepared a report dated 10 July 2005. The report set out the history of the project and commented on the issues listed by the territorial authority under the particulars of contravention or non-compliance attached to the notice to fix. In summary, the architects were of the opinion that a vented cavity was not required for the cladding and that there were elements of construction which put the house into a low-risk category. The architects considered that if the suggested remedial work was implemented, and the paint system adequately maintained, then the amendments to the original consent would be valid for a further 10 years. The report was forwarded to the territorial authority under a covering letter dated 10 July 2005.

3.9 The territorial authority wrote to the applicants on 5 August 2005, acknowledging receipt of the architects' report. The territorial authority was in agreement with some of the report's proposals. However, the territorial authority still had concerns about some aspects of the cladding, the proposal to discharge stormwater, and the question of the durability of the building elements.

3.10 The architects responded in a letter to the territorial authority dated 16 June 2006. In particular, the cladding was to be replaced with boards and battens incorporating drainage provisions, a drainpipe would be closed off, and the courtyard would be re-contoured to discharge water away from the house. The architects suggested that the items listed as being durability concerns be inspected in conjunction with the territorial authority. Any items not in good condition would be replaced and those that were in good condition should be subject to a waiver from the territorial authority.

3.11 The territorial authority wrote to the architects on 27 July 2006. The territorial authority accepted the re-cladding proposal but noted that a new consent was required for this work. The territorial authority also accepted the proposals regarding the closed-off downpipe and re-contoured land. The territorial authority noted that the durability matters were quite involved and suggested that the applicants seek a determination regarding this matter.

3.12 An application for a determination was received by the Department on 19 October 2006.

4. The submissions

4.1 In a covering letter to the Department dated 14 October 2006, the architects described the background to the matters in question. The architects suggested that, rather than replacing the cladding, the cladding matters raised by the territorial authority in its notice to fix should be addressed. The architects also suggested that the durability of the items in question be measured from 1 January 1994, which was the date when substantial completion was achieved.

4.2 The applicants forwarded copies of:

- the plans and specifications
- some consent documentation and inspection records
- the notice to fix
- the correspondence with the territorial authority and the architects
- the architects' report of 10 July 2005.

4.3 In a letter to the Department dated 19 October 2006, the territorial authority noted what it considered to be the areas of contravention.

4.4 The territorial authority forwarded copies of:

- the plans
- the consent documentation and inspection records
- the notice to fix
- the correspondence with the applicant and other interested parties.

4.5 Copies of the submissions and other evidence were provided to each of the parties.

4.6 A copy of the draft determination was forwarded to the parties on 7 February 2007. The draft was issued for comment and for the parties to agree a date when all the building elements installed in the house complied with the Clause B2 Durability.

4.7 The parties accepted the draft determination and agreed that compliance with Clause B2 was achieved on 20 January 1994.

5 The expert's report

5.1 The expert inspected the basement alterations on 11 December 2006, and furnished a report that was completed on 19 December 2006. The expert cut away the plaster at two locations to examine the construction. I am prepared to accept that the details revealed by these inspections apply to other similar locations throughout the building.

5.2 The expert took non-invasive moisture readings internally and no elevated readings were recorded. The expert then took invasive moisture readings into the wall framing and the following higher levels were recorded.

- 19%, 23%, and 24% (at 2 locations) at the south elevation.
- 20%, 22%, 23%, 28%, and 33% at the east elevation.

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

5.3 Commenting specifically on the cladding, the expert said:

- the thicknesses of the plaster coats do not conform with the relevant NZ standard
- the reinforcing mesh to the plaster has not been spaced adequately from the building paper
- there are no horizontal or vertical joints provided in the plaster
- there are no transition joints installed between the junction of the blockwork and the timber framing
- the sealant joint between the south-facing glass block window and the plaster has perished and this has led to the ingress of moisture into the building
- there are cracks visible in plaster to the general wall areas and at the corners of the external joinery units
- the bottom edge of the plaster extends onto or below the ground and paved areas at some locations
- there are no flashings installed around the exterior joinery unit perimeters. However, a bell mouth plaster moulding has been formed over one set of French doors and the side screen of the northeast bedroom
- the timber plate supporting the ground floor deck is bolted directly onto the plaster and there are no provisions for drainage at these locations

- some penetrations through the cladding are inadequately sealed
- the gas and electricity meter-boxes lack flashings.

5.4 The expert also noted that there were inadequate falls to the ground and paved levels and also that there was either inadequate or no protection to the base of the structural steel stanchions.

5.5 Copies of the expert's report were provided to each of the parties on 21 December 2006.

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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[3], 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[4] (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, both the design of the cladding system and its installation need to be carefully carried out.

[3] 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.
[4] Copies of all determinations issued by the Department can be obtained from the Department's website.

6.2 Weathertightness risk

6.2.1 In relation to these characteristics I find that the house as finally constructed:

- is built in a low wind zone
- is three storeys high
- is relatively complex in plan and form
- generally has no eaves projections that could protect the cladding
- has no external balconies
- has external wall framing that is likely to be treated to a level that provides resistance to the onset of decay if the framing absorbs and retains moisture.

6.2.2 When evaluated using the E2/AS1 risk matrix, three elevations of the house demonstrate a high weathertightness risk and the remaining elevation a very high 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.

7 Discussion

7.1 Taking into account the expert's report, I am satisfied that the current performance of the cladding installed on the basement alterations is inadequate because it has not been installed according to good trade practice and is allowing water to penetrate defects in the cladding, which in turn may have led to the framing timber rotting at some locations. The cladding demonstrates the key defects listed in paragraph 5.3. I have also identified the presence of a range of known weathertightness risk factors in the completed house. The presence of the risk factors on their own is not necessarily a concern, but they have to be considered in combination with the significant faults identified in the cladding system. It is that combination of risk factors and faults that indicate that the structure does not have sufficient provisions that would compensate for the lack of a drained and ventilated cavity. Consequently, I am not satisfied that the cladding system as installed complies with either clause B2 or clause E2 of the Building Code.

7.2 The expert has also raised concerns about paving and ground contours and the protection of the steel stanchions. With regard to the paving and ground levels, I note that the applicants have proposed amendments to the ground contours that would alleviate this problem, and which appear to satisfy the territorial authority's concerns. However, I draw to the territorial authority's attention the question of protection of the steel stanchions and suggest that the territorial authority look into this matter and take appropriate action if required.

7.3 I find that, because of the extent and apparent complexity of the faults that have been identified with the cladding, I am unable to conclude, with the information available to me, that remediation of the identified faults, as opposed to partial or full re-cladding, could result in compliance with clauses B2 or E2. I consider that final decisions on whether code compliance can be achieved by either remediation 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 territorial authority for its comment and approval. I note that the applicants, through their architects, originally proposed to the territorial authority that the basement alterations be re-clad. That may be one option for the parties to consider.

Matter 2: The durability considerations

8 Discussion

8.1 The territorial authority has concerns about the durability, and hence the compliance with the building code, of certain elements of the basement alterations, taking into consideration the completion of the building in January 1994.

8.2 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).

8.3 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.

8.4 It is not disputed, and I am therefore satisfied that all the building elements installed in the house, apart from items that have to be rectified as described in paragraph 7.3, complied with clause B2 on 20 January 1994. This date has been confirmed by the applicant and the territorial authority, refer paragraph 4.7.

8.5 In order to address these durability issues, I sought some clarification of general legal advice about waivers and modifications. I have now received that clarification and the legal framework and procedures based on this clarification are described in

previous determinations (for example, Determination 2006/85) and are used to evaluate the durability issues raised in this determination.

8.6 I continue to hold that view, and therefore conclude that:

(a) the territorial authority has the power to grant an appropriate modification of clause B2 in respect of the building elements

(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 code compliance certificate had been issued in 1994.

8.7 I strongly recommend that the territorial authority record this determination and any modifications resulting from it, on the property file, and also on any LIM issued concerning this property.

9 The decision

9.1 In accordance with section 188 of the Building Act 2004, I determine that the cladding on the building does not comply with clauses B2 and E2 of the Building Code, and accordingly confirm the territorial authority's decision to refuse to issue a code compliance certificate.

9.2 I also determine that:

(a) all the building elements installed in the house, apart from the items that are to be rectified, complied with clause B2 on 20 January 1994.

(b) building consent HC/93/01121 is hereby 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 20 January 1994 instead of from the time of issue of the code compliance certificate for the building elements except those elements which have been altered or modified as set out in Determination 2007/29.

(c) once all the defects in building consent HC/93/01121 have been fixed to its satisfaction, the territorial authority is to issue a code compliance certificate in respect of that consent as amended.

9.3 The notice to fix dated 7 June 2005 should be withdrawn and a new notice to fix should be issued requiring the owner to bring the house into compliance with the Building Code. The notice to fix may list the items to be rectified, including any associated defects discovered during the course of that work, but it should not specify how compliance is to be achieved as that is for the owner to propose and for the territorial authority to accept or reject. It is important to note that the Building Code allows for more than one method of achieving compliance.

9.4 I would suggest that the parties adopt the following process to meet the requirements of paragraph 9.3. Initially, the territorial authority should issue the new notice to fix, listing all the items that the territorial authority considers to be non-compliant. 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 of the specified issues. Any outstanding items of disagreement can then be referred to the Chief Executive for a further binding determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 5 March 2007.

John Gardiner
Determinations Manager