Determination 2007/62

Determination regarding a code compliance certificate for a house at 536 Kaipara Road, Papakura, 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 applicant is Mr N Job ("the applicant") and the other party is the Papakura District Council ("the territorial authority").

1.2 The original matter for determination was the territorial authority's decision to refuse to issue a code compliance certificate for a house because it was not satisfied that it complied with clause E2 "External Moisture" of the Building Code[2] (First Schedule, Building Regulations 1992).

1.3 At the hearing (refer paragraph 6), the parties widened the scope of the determination to include the durability of the building elements.

[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.

1.4 Thus, the two matters to be determined are:

Matter 1: The cladding

a) Whether the cladding as installed to the walls of the building complies with clause E2 (see sections 177 and 188 of the Act). 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 together.

Matter 2: The durability considerations

b) The elements that make up the building work comply with clause B2 "Durability" of the Building Code, taking into account the age of the building work.

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"), the legal opinion that I have obtained, and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 7.1.

1.6 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 a mainly two-storey detached house situated on an excavated sloping site, which is in a medium wind zone for the purposes of NZS 3604[3]. The house is relatively simple in plan and form. Apart from some basement block walls, construction is conventional light timber frame constructed on either concrete or timber-framed floors. The pitched roofs have hip and wall-to-roof junctions and have, in part, 600mm wide eaves projections.

2.2 Suspended timber-framed open boarded decks are constructed at the lower level of three elevations. Timber-framed pergolas are fixed through the cladding at three locations. The expert has noted that the decks and pergolas were not shown on the original drawings. I observe though that the decks and pergolas are building work and must comply with the building code even if they were not shown on consent drawings.

2.3 It is established to my satisfaction that the external wall framing timber is Boric treated.

2.4 The external walls of the house are clad with "Harditex" fibre-cement sheets fixed through the building wrap to the framing, and finished with 2mm to 5mm thick "Fosroc" and "Multiplast" plaster textured systems, which have recently been repainted with 2 coats of "Resene X200". Planted mouldings and mid-floor bands are situated at some locations.

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

3. Sequence of events

3.1 The territorial authority issued Building Consent No 11319 on 6 January 1995. A second consent (No 13204) for an addition to the house was issued on 7 May 1997.

3.2 The applicant contends he asked for a final inspection under the first building consent at the time he applied for the second consent, but was told by the territorial authority that work under both consents would be given a combined final inspection when the work under the second consent was completed.

3.3 The territorial authority carried out various inspections of the property during its construction, including a final inspection of both stages of construction on 18 March 2005.

3.4 After the final inspection, the territorial authority wrote to the applicant on 28 March 2005 noting issues that needed addressing before a code compliance certificate could be issued. One of these issues was:

> As Harditex has been used on both these consents and as we have not been able to inspect this, Papakura District Council require a suitably qualified person to produce a report relating to weather tightness of this cladding.

3.5 The applicant disputes the territorial authority's assertion that it "has not been able to inspect [the Harditex]". The applicant notes that copies of the territorial authority's inspection records indicate that the territorial authority did inspect the Harditex in March 1995 (under consent No 11319) and in September 1997 (under consent No 13204).

3.6 According to the territorial authority, it informed the applicant that it would be prepared to accept a satisfactory inspection report from a suitably qualified party. It would have been helpful if the territorial authority's letter to the applicant, dated 28 March 2005, had explained that new inspection of the house was necessitated by the long delay between the last inspection and the date on which the applicant sought a code compliance certificate.

3.7 The applicant engaged a consultant to provide a moisture check and a weathertightness inspection of the property. The consultant inspected the building on 10 May 2005 and provided a report dated 12 May 2005. The consultant described the building, noted several areas with elevated moisture readings, and items of non-compliance. The territorial authority did not receive a copy of this report.

3.8 The territorial authority has not issued a notice to fix as required by section 435.

3.9 An application for a determination was received by the Department on 18 September 2006.

4. The submissions

4.1 In a covering letter to the Department, the applicant described the background to the matters in question and the persons engaged in the construction of the house. The applicant confirmed that H1 Boric treated framing was used and described the materials and applications relating to the cladding. The applicant noted that the building was re-painted between January and April 2006.

4.2 The applicant forwarded copies of:

- the plans
- some consent documentation
- some inspection records
- the territorial authority's letter to the applicant of 28 March 2005
- the consultant's report of 12 May 2005
- some manufacturer's instructions.

4.3 In a letter to the Department, dated 20 September 2006, the territorial authority raised some procedural issues and noted that it could not issue a code compliance certificate for the house until it was satisfied that the cladding was code-compliant. The territorial authority stated that it had not received the independent consultant's report that it had requested. The territorial authority could not confirm whether the cladding joints were sealed nor could it verify the quality of the plaster application. It noted that the applicant, who had applied the plaster, was not a formally qualified plasterer or an approved "Hardiflex system applicator". The territorial authority could not confirm that the exterior cladding complied with either the manufacturer's instructions or with clause E2.

4.4 The territorial authority forwarded copies of:

- some consent and inspection documentation
- a list of approved persons who undertake site inspections and reporting protocol.

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

4.6 I issued a draft determination to the parties for comment on 23 November 2006. The draft was accepted by the territorial authority.

4.7 The applicant considered that the draft should not have been issued until I had had the opportunity to consider his comments on the expert's report which were received on 24 November 2006 (refer paragraph 5.7).

4.8 The second draft determination, which took account of the applicant's comments, was issued to the parties for comment on 17 January 2007. The territorial authority accepted the second draft.

4.9 The applicant did not accept the second draft and made extensive submissions in a letter to the Department dated 6 February 2007. A hearing was requested which was held on 18 April 2007 (refer paragraphs 6.1 to 6.4).

5. The expert's report

5.1 The expert inspected the claddings of the house on 26 October 2006, and furnished a report that was completed on 6 November 2006. The expert noted that the appearance of the cladding is generally straight and flat with only minor variations to line and level. Apart from where repairs have been undertaken, the texture and paint finish is uniform and sound. The expert was of the opinion that the house had been constructed with reasonable care, apart from some aspects of the installation of the cladding and the roofing and the forming of junctions. The expert removed the cladding at several locations to observe the construction and potential moisture ingress.

5.2 The expert took non-invasive moisture readings internally and found three elevated readings of 19%, 20% and 23%. Non -invasive moisture readings were taken through the wall cladding and higher readings of 27% (at 2 locations) and 40% (at 4 locations) were recorded. Further invasive readings produced higher readings of 23%, 25%, and 25%. Moisture levels above 18% recorded after cladding is in place generally indicate that external moisture is entering the structure.

5.3 The expert also noticed wrinkled building paper and stained timbers at some locations that provided evidence of water entry. The expert removed samples of the wall framing timber from 3 separate locations and forwarded them to a laboratory for testing. The tests revealed that two samples were sound and, while they exhibited occasional hyphae, there was no significant loss of cell wall strength. The tests also revealed high levels of Boron were present in all the samples, confirming that the timber was treated to resist decay. However the third sample, taken from the bottom plate packer at the south-east corner of the master bedroom, was unsound and exhibited moderate brown rot with some loss of strength.

5.4 The expert also removed two small areas of the "Harditex" sheeting and these were also sent for testing. While one sample showed no evidence of fungi or strength loss, the second sample indicated the presence of stachybotrys and significant loss of strength. The applicant says the second sample was taken from an atypical location and that the Harditex has now been removed from that location.

5.5 The expert also was of the opinion that the loss of strength in one of the tested "Harditex" samples raised concerns as to the bracing integrity of the house, which relies in part on "Harditex" bracing panels to meet the requirements of clause B1.

5.6 Copies of the expert's report were provided to each of the parties on 9 November 2006.

5.7 The applicant replied with comments on both the reports in a comprehensive letter to the Department dated 23 November 2006. Reference was made to the first report and aspects of the fixing and flashing of the Harditex and repairs to a gully trap. The applicant commented on the second report noting some repairs that had been carried out and what he considered to be some discrepancies in the expert's report. The applicant also referred to aspects of the cladding, painting, sealing and flashings. In a letter dated 6 February 2007, the applicant made a further submission commenting on the second draft determination.

6 The hearing

6.1 The applicant requested a hearing, which was held on 19 April 2007 before me. I was accompanied by a Referee engaged by the Chief Executive under section 187(2) of the Building Act 2004. The applicant appeared on his own behalf, accompanied by two family members, and the territorial authority was represented by one of its officers. Three staff members of the Department also attended.

6.2 The applicant's verbal submission was predominantly based on his letter dated 6 February 2007. The applicant discussed the background to the dispute and described aspects of the construction, which I summarise as follows:

- The use of external cladding sheets as bracing panels (which have to be whole sheets) tended to dictate the sheet layout and override the manufacturer's recommendations to cut sheets around the windows.
- The gully trap has been moved and the adjoining blocks have also been removed.
- The manufacturer's details current at the time of construction did not require movement joints in walls less than 11 metres long.
- The apron flashings did not require kick-outs, and the ends of the flashings were correctly sealed.
- The window flashings supplied by the manufacturer had been installed and in some locations the windows were adequately sheltered.
- The windows jamb flanges had been sealed to the cladding with "Flexipaste".
- Gutters and downpipes are now installed at the north-side roof.
- The problem with the beam at the bathroom and entry areas had been rectified.
- The top of the pergola beam has been notched to prevent the transit of water along its top surface.
- The deck ribbon plates have been taken off and replaced with spacers between the plates and cladding.
- The only roof that would require the roof pans to be turned down is the low pitch roof over the entry area.
- The cladding has been repainted with a flexible-type paint with a high degree of reflectivity.

- Blockwork that had been constructed against the cladding at the south-east corner of the master bedroom had been removed. No further signs of moisture ingress are evident and the timber had dried out.
- There are still signs of slightly raised moisture levels in the bottom plate in the utility room.
- A low moisture reading was recorded at the interior of the central pier.

6.3 The territorial authority made a verbal submission, which I summarise as follows:

- Matters relating to the durability of the building would be placed on the LIM.
- The territorial authority would issue a notice to fix, and once the items listed on the notice are rectified, it would inspect the house.
- The required end result would be the issue of a code compliance certificate.

6.4 The applicant invited me to visit the property to inspect the relevant building elements. The territorial authority was also invited to attend but declined. I visited the site together with the applicant, the Referee, and the staff members of the Department.

6.5 Following the hearing a revised draft determination was circulated to the parties. This was accepted with minor non-contentious amendments by the territorial authority who also advised the completion dates for the two consents; April 1997 for No 11319 and May 1998 for No 13204. The applicant did not accept the draft determination and asked for his attached submissions to be taken into consideration. The applicant also confirmed the consent completion dates.

6.6 I have taken note of the comments of the parties and included these into the final determination as appropriate.

Matter 1: The cladding

7. Evaluation for code compliance

7.1 Evaluation framework

7.1.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solution[4], 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.

[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.

- 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.

7.1.2 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[5] (refer to Determination 2004/1 *et al*) relating to cladding and these factors are also used in the evaluation process.

7.1.3 The consequences of a building demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.

7.2 Weathertightness risk

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

- is built in a medium wind zone
- is a maximum of two storeys high
- is relatively simple in plan and form
- has, in part, 600mm wide eaves projections to protect the cladding
- has several external open decks
- 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.

7.2.2 When evaluated using the E2/AS1 risk matrix, two elevations of the house demonstrate a low weathertightness risk and the remaining elevations a medium 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.

8 Discussion

8.1 Taking account of the submission made at the hearing, including the opportunity to visit the house, as well as the expert's report, I am now better equipped to evaluate

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

the code compliance of this house. There are two groups of matters I need to consider.

8.2 The first group consists of matters which do not require remedial work; they are:

- the layout of the external cladding sheets and the role of the sheets as bracing panels
- the use of Flexipaste as a sealant between window jamb flanges and the cladding
- the lack of control joints.

I comment on these matters in paragraphs 8.4 to 8.6.

8.3 The second group are matters which need attention, they are:

- the moisture in the utilities room
- provision of kick-outs to end of four roof apron flashings
- replacement of timber showing signs of brown rot
- the provision of turn-downs to the pans of the low-pitched entry roof

I comment on these matters in paragraphs 8.7 and 8.8.

8.4 Layout of external claddings and their role as bracing panels

8.4.1 The requirements for Harditex installation, published by James Hardie in 1992, required movement joints at 5.4 metre maximum centres. The instructions also show that sheets should be cut around the windows. However in this particular case the need for bracing performance, which prevented complete compliance with the manufacturer's instructions, has not compromised the performance of the cladding.

8.4.2 I am satisfied that the rectification work carried out on the bracing panels has removed the danger to the bracing integrity of the house (refer paragraph 5.5).

8.5 Use of sealant around windows

8.5.1 "Flexipaste" was supplied by Fosroc but is now manufactured by Sika (NZ) Ltd. The product is described by the current manufacturer as being intended for jointing between the cladding sheets and similar applications, but there is no indication from the manufacturer that it is suitable for use as a sealant between aluminium window jambs and the cladding. However in this particular case, as the window installation has met the requirements of Clause E2 of the Building Code for over 10 years, I take the view that the windows also meet the requirements of Clause B2.

8.6 Lack of control joints

8.6.1 With respect to movement control relief joints, most of the external walls in the house are less than 5.4 metres in length. However the West wall that exceeds 5.4 metres in length has a horizontal relief joint but not a vertical movement joint. I take

the view that this wall, which is low risk and has shown no signs of cracking or water ingress to date, meets the requirements of Clause B2 of the Building Code. As all three of these items are not fully in accordance with best practice they will require regular inspection and maintenance.

8.7 Moisture in Utilities Room

8.7.1 I observed some repairs that have been carried out since the expert's inspection but note there are still raised moisture levels in the wall framing in the utilities room. That may indicate that the house does not comply with clause E2 or, if the moisture has an internal source, clause E3 Internal Moisture. While this may be the result of internally generated moisture such as condensation from showers and clothes washing, I recommend this location be further investigated to establish whether or not there is external moisture entry. If no identifiable cause of the moisture can be established the moisture content of the timber frame should be regularly monitored in the future.

8.8 Provision of kick-outs, timber with brown rot, and turn-downs to the entry roof pans

8.8.1 Each of these three points need to be dealt with so the building can continue to comply with the durability requirements of clause B2. Clause B2 requires that a building continues to satisfy all the objectives of the Building Code throughout its effective life, and that includes the requirement for the house to remain weathertight. Because these cladding and roofing faults on the building are likely to allow the ingress of moisture in the future, the house does not comply with the durability requirements of clause B2.

8.9 Conclusion

8.9.1 Taking into account the expert's report and the parties' submissions, and because the faults identified with the cladding system occur in discrete areas, I am able to conclude that satisfactory rectification of the following items will result in the building remaining weathertight and in compliance with clauses B2, E2, and E3 (if applicable, see paragraph 8.7):

- The provision of kick-outs to the end of the four roof apron flashings.
- The replacement of timber showing signs of brown rot, to the satisfaction of the territorial authority, at the south-east corner of the master bedroom.
- The provision of turn-downs to the pans of the low-pitched entry roof (to prevent wind blown water being pushed under the flashing and over the top of the cladding sheets).

8.10 I emphasise that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular cladding or roofing 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.

8.11 Effective maintenance of claddings (in particular monolithic cladding) is important to ensure ongoing compliance with clauses B2 and E2 of the Building Code and is the responsibility of the building owner. Clause B2.3.1 of the Building Code requires that the cladding be subject to "normal maintenance", however that term is not defined in the Act.

8.12 I take the view that normal maintenance is that work generally recognised as necessary to achieve the expected durability for a given building element. With respect to the cladding, the extent and nature of the maintenance will depend on the material, or system, its geographical location and level of exposure. Following regular inspection, normal maintenance tasks should include but not be limited to:

- where applicable, following manufacturers' maintenance recommendations
- washing down surfaces, particularly those subject to wind-driven salt spray
- re-coating protective finishes
- replacing sealant, seals and gaskets in joints.

Matter 2: The durability considerations

9. Discussion

9.1 The parties have questioned the durability, and hence the compliance with the building code, of the elements of the building, taking into consideration the issue of the building consents in 1995 and 1997.

9.2 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).

9.3 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.

9.4 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 8.9.1, complied with clause B2 in April 1997 for consent No. 11319, and May 1998 for consent No. 13204. This date has been confirmed by the applicant and the territorial authority, refer paragraph 6.5.

9.5 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.

9.6 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 all of the elements of the building

(b) it is reasonable to grant such a modification because in practical terms the building is no different from what it would have been if code compliance certificates had been issued in 1995 and 1997.

9.7 I strongly recommend that the territorial authority record this determination and any modification arising from it, on the property file and also on any LIM issued concerning this property.

10 The decision

10.1 In accordance with section 188 of the Act, I determine that the cladding and roof systems do 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.

10.2 I also determine that:

(a) all the building elements installed in the building under building consent No 11319, apart from the items that are to be rectified, complied with clause B2 on 1 April 1997.

(b) all the building elements installed in the building under building consent No 13204, apart from the items that are to be rectified, complied with clause B2 on 1 May 1998.

(c) the building consents are hereby modified as follows:

(In respect of building consent No. 11319)

> The building consent is subject to a modification to the Building Code to the effect that, clause B2.3.1 applies from 1 April 1997 instead of from the time of issue of the code compliance certificate for all of the building elements, provided that this modification does not apply to the elements that have been altered or modified in Determination 2007/62.

(In respect of building consent No. 13204)

> The building consent is subject to a modification to the Building Code to the effect that, clause B2.3.1 applies from 1 May 1998 instead of from the time of issue of the code compliance certificate for all of the building elements, provided that this modification does not apply to the elements that have been altered or modified as set out in Determination 2007/62.

(d) following the modifications set out in (c) above, together with satisfactory rectification of matters identified in the notice to fix (refer paragraph 10.3)**,** the

territorial authority is to issue code compliance certificates in respect of each of the two building consents as amended.

10.3 I note that the territorial authority has not issued a notice as required by section 435. A notice to fix should now be issued that requires the owner to bring the building into compliance with the Building Code, identifying the defects listed in paragraph 8.9.1 and including any defects associated with this work discovered in the course of rectification. The notice to fix should not specify how the defects are to be fixed. That is a matter for the applicant to propose and for the territorial authority to accept or reject. I note that the Building Code allows for more than one means of achieving compliance.

10.4 I suggest that the parties adopt the following process to meet the requirements of paragraph 10.3. Initially, the territorial authority should issue a 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 or otherwise of the specified items. 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 12 June 2007.

John Gardiner
Manager Determinations