



Determination 2009/62

The issue of a notice to fix for a house at 92A Reihana Street, Orakei, Auckland



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, the Mr L Yang (“the applicant”), represented by an agent, and the other party is the Auckland City Council (“the authority”), carrying out its functions and duties as a territorial authority or building consent authority.
- 1.2 This determination arises from the decisions of the authority to refuse to issue a code compliance certificate and to issue a notice to fix for a two year old house because it is not satisfied that the building work complies with the requirements of certain clauses of the Building Code² (First Schedule, Building Regulations 1992). Specifically, the notice to fix cites contraventions of Clauses B1 Structure, B2 Durability, E2 External moisture, and H1 Energy efficiency.

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 In order to determine whether the decisions to issue the notice to fix and refuse to issue the code compliance certificate were correct, I consider the matter for determination, under section 177(a) of the Act³, is whether the external envelope of the house complies with Clauses B2 Durability and E2 External Moisture of the Building Code. The “external envelope” includes the cladding, its configuration and its components, junctions with other building elements, formed openings for windows, etc, penetrations, decks, parapets, and the proximity of building elements to the ground.
- 1.4 I note the notice to fix indicates that some aspects of the building work contravene Clauses B1 and H1 of the Building Code (refer to paragraph 3.7). I note there are no specific items within the notice to fix that relate directly to these clauses, and I have not received any evidence to suggest there is a dispute about them (refer to paragraph 4.5). I have therefore not considered these clauses further within this determination.
- 1.5 In making my decision, I have considered the submissions of the parties, the report of the independent expert commissioned by the Department to advise on this dispute (“the expert”), and the other evidence in this matter. I have evaluated this information using a framework that I describe more fully in paragraph 6.1.

2. The building work

- 2.1 The building is a complex, three-storey dwelling, constructed on a steep site, in a high wind zone for the purposes of NZS 3604⁴. The construction consists of concrete blockwork and ground slabs, and light timber frame, which is clad in a combination of monolithic cladding and weatherboards, with aluminium joinery. There are two balconies, a curved porch, and flat and pitched roofs and parapets, all of which are clad with a butynol membrane. The balconies are tiled over the membrane. The roof has internal gutters and no eaves.
- 2.2 The exterior cladding combination is direct fixed cedar weatherboards and textured coated EIFS on 60mm polystyrene that has been installed over a cavity system.
- 2.3 The records submitted by the applicant as a part of the application includes a quote, dated 28 October 2003, for the cost of the building elements required for the project. The quote shows the both the wall framing and roof framing as kiln dried timber. Based on this evidence and given the date of construction, I consider that the framing of this house is unlikely to be treated to a level that will provide resistance to fungal decay.

3. Background

- 3.1 A building consent was issued for the house on 13 May 2003 (No. AC/03/01826), based on a certificate issued by a building certifier (Compass Building Certificate Limited) (No. 4739) dated 13 May 2003.
- 3.2 According to the submission by the applicant, construction started in October 2003. I have not seen any records of inspections carried out by the building certifier during construction, other than the record of the final inspection, which was carried out on 2 April 2007. The inspection record notes that a re-inspection was required.

³ 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

⁴ New Zealand Standard NZS 3604:1999 Timber Framed Buildings

- 3.3 According to the submission by the applicant, the building certifier carried out the re-inspection and all building works were completed. I have not seen these records. The submission also notes that all documentation for the code compliance certificate application was provided to the authority by the building certifier.
- 3.4 On 9 November 2007, the authority carried out its own final inspection of the building work. The inspection notes record the items requiring rectification and completion were:
1. E2 – Cladding to comply with [Building Code Clause] E2 (head flashings)
 2. B2 – Timber framing not treated to roof structure
 3. G13 – Overflow relief gulley to be completed
 4. B1 – Confirm deck barrier compliance with [Building Code Clause] B1
 5. E2/B2 – Warranties required/PS construction for poly cladding.
- 3.5 On 10 December 2007, the authority completed a recheck for the final inspection, and the notes state ‘Recheck final approved except: Head flashings above joinery do not vent and drain and timber framing to roof not treated’.
- 3.6 According to the submission from the applicant, these issues were attended to and further documentation was provided to the authority.
- 3.7 The authority carried out a further re-inspection on 28 April 2008. Following this inspection, on 2 May 2008, a notice to fix was issued to the applicant. The notice to fix specifically cited contraventions of Building Code Clauses B1 Structure, B2 Durability, E2 External moisture, and H1 Energy efficiency.
- 3.8 The Department received an application for determination on 27 April 2009.

4. The submissions

- 4.1 The applicant made a submission explaining the sequence of events and included copies of:
- the notice to fix, the letter of refusal to issue a code compliance certificate, and the inspection notes from the final inspections
 - the final inspection records from the building certifier
 - a letter from a building consultancy firm appointed by the applicant to address the issues raised in the notice to fix
 - producer statements for various elements of the construction of the house
 - the consented documentation including the plans and specifications for the building work.
- 4.2 Copies of the submissions and other evidence were provided to the parties.
- 4.3 The authority submitted a CD-Rom of the records held by the authority for the property.
- 4.4 A draft determination was issued to the parties for comment on 20 July 2009.
- 4.5 The applicant accepted the draft without comment. The authority accepted the draft but noted that the notice to fix issued on 1 May 2008 included areas of contravention to Clauses B1, B2, E2 and H1. However the authority did not provide any information regarding specific items that contravened Clauses B1 or H1.

5. The expert's report

- 5.1 As discussed in paragraph 1.4, I engaged an independent expert to provide an assessment of the condition of those building elements subject to the determination. The expert is a member of the New Zealand Institute of Building Surveyors. The expert inspected the house on 29 May 2009 and furnished a report that was completed on 5 June 2009.
- 5.2 The expert noted the dwelling has been constructed in accordance with the consent documents and their amendments and the overall construction was of a good and consistent standard.
- 5.3 With respect to the EIFS cladding, the expert noted there were no visible cracks in the cladding and coating, that a high standard of alignment and finish has been achieved, and that the texture coating is even with and well finished at all junctions. The expert also noted that the penetration sealing was of a good quality and there was full continuity of cladding behind obstructions. The expert noted that while some difficult membrane flashing junctions were untidy, they appeared to be effective.
- 5.4 Commenting specifically on the EIFS cladding, the expert noted there was an area of incomplete cladding at the junction of the foyer roof parapet and the external corner of a short return wall.
- 5.5 The expert completed a visual inspection of all interior areas and took non invasive moisture readings of exterior walls. The expert recorded no elevated readings and found no apparent evidence of moisture ingress or damage.
- 5.6 The expert investigated the features of the horizontal roofs and balconies and found the following features:

Roof or deck area	Area	Falls	Features
Entrance canopy roof	3.5m ²	0.6° fall to gutter	65mm internal gutter and single outlet to internal downpipe, 65mm high curved parapet with inward sloping top, 45mm overflow through parapet
Roof area off master bedroom	5.8m ²	2.6° fall to scupper	265mm parapet with inward sloping top, 165×105mm scupper, single 45mm overflow
Roof over garage	22m ²	7° fall	Internal gutter, one 55mm outlet and 110×70mm scupper
Lounge balcony	7m ²	0.3° fall to short edge, 1.2° fall to long edge	110mm step up to floor level, clearance of cladding to tiles of 40mm for weatherboard, and 50mm for EIFS
Roof over family room and bedroom 3 (besides master bedroom balcony)	34m ²	1° fall	45° edge detail and 150×150mm gutter
Roof over foyer	7.2m ²	0.9° fall at scupper, 1.2° fall at wall, 0.1° fall at ponding area (refer to 5.7.1)	110×70mm scupper and 45mm overflow

Balcony off master bedroom	12.2m ²	1° cross fall to outlet at outer edge, 0.2° fall at other locations, 15.9° inward slope of edge tile	200mm tile upstand, 50mm overflow, 165x65mm scupper, clearance of cladding to tiles of 95mm for weatherboard and 45mm for EIFS
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5.7 The expert reviewed the issues raised in the notice to fix (refer to paragraph 3.7), noting that the applicant advised that some remedial work had been carried out since the notice to fix was issued. The following issues were raised in the notice to fix:

5.7.1 Building work not as per manufacturer's instructions

Issue raised by authority	Expert's comments
There is a lack of fall to horizontal surfaces.	The area at the front entry canopy is well constructed with a 0.6° fall to the internal gutter and is a low collection area, with no ponding at the time of inspection. There is light ponding evident at the internal gutter of the garage roof and to the foyer roof.
There is a lack of clearance of EIFS cladding to deck surfaces.	There was no evidence of contact between the cladding and balcony or roof surfaces – the cladding had 35mm clearances at the garage roof, 40-50mm clearances at the lounge balcony, 45mm clearances at the foyer roof and family room roof, and 45mm clearances at the master bedroom balcony.
There is a lack of clearance of EIFS cladding to paving.	50mm clearances were achieved in all areas.
There is a lack of extension of polystyrene and plaster coating to behind the fascia board.	The cladding is flush with the shaped capping, with coating applied, then fascia is fixed but fully wrapped in the continuous roofing membrane. The membrane is returned to the back of the bottom edge of the fascia. The detail is effective.
There is a lack of drainage holes to bottom edge of cavity.	All areas were examined and the only area where there was restricted ventilation was a small area of return of protected wall on the west elevation.
There is sealant to the junction of the cladding and the window head flashings.	The sealing to the head flashings had all been removed.
The sill flashing detail is unconfirmed and there is sealant to the junction of the cladding and joinery.	There are PVC sill flashings in place and the sealing to the sill flashings had all been removed.

5.7.2 Building work not as per Acceptable Solution or approved alternative solution

Issue raised by authority	Expert's comments
Two outlets are required to internal gutters/decks, with a minimum internal diameter of 63mm for the overflows.	Contained roof and balcony areas have only one outlet and one overflow. Outlets are generally 45mm or 55mm and overflows are 45mm or 50mm. The downpipes are all 60x60mm with spreaders and hoppers with overflow slots. Scuppers are generally 110x70, 165x105, or 165x65.
Spreaders are required for downpipes discharging to lower roof areas.	
The scupper outlets through the parapets should be 200mm wide by 75mm high.	

5.7.3 Building work not as per accepted trade practice

Issue raised by authority	Expert's comments
Penetrations through the cladding must be waterproof, with rubber flanges and silicon, or have flashings installed.	All cladding penetrations were well sealed. The air conditioning pipes passing through the concrete foundation wall are unsealed.

5.7.4 Building work not as per Building Code

Issue raised by authority	Expert's comments
There is ponding to the roof above the lounge and the front entrance canopy. Falls to decks and roofs must be at least 2° in order to allow moisture to be efficiently shed.	There is light ponding evident at the internal gutter of the garage roof and to the foyer roof. The horizontal roof and balcony areas range from 0.1-7° falls.

5.8 A copy of the expert's report was provided to each of the parties on 15 June 2009.

5.9 The authority submitted a response to the expert's report noting details about the non-compliance of the entry canopy parapet, the ground clearances of the cladding, the scuppers, outlets and overflows, and the ponding to the roof areas. I have responded to the matters raised by the authority in paragraph 7.4.4.

6. Evaluation for code compliance

6.1 Evaluation framework

6.1.1 I have evaluated the code compliance of this building by considering the weathertightness of the external building envelope (Clause E2) and durability (Clause B2 in so far as it relates to Clause E2).

6.1.2 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solutions⁵, 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 one or more other provisions to compensate for that in order to comply with the Building Code.

The external envelope

7. Weathertightness

7.1 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of the design of the building, the surrounding environment, the

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.

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 determinations⁶ (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.

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

7.3 **Weathertightness risk**

7.3.1 This house has the following environmental and design features which influence its weathertightness risk profile:

Features tending to increase risk

- the house is in a high wind zone
- the house is three storeys high
- the roof to wall intersections are fully exposed and finish within the boundaries of exterior walls
- there are no eaves
- the house has a moderately complex envelope shape with two cladding types
- the house has enclosed balconies at first floor level, exposed in plan

7.3.2 The house has been evaluated using the E2/AS1 risk matrix. The risk matrix allows the summing of a range of design and location factors applying to a specific building design. The resulting level of risk can range from 'low' to 'very high'. The risk level is applied to determine what claddings can be used on a building in order to comply with E2/AS1. Higher levels of risk will require more rigorous weatherproof detailing; for example, a high risk level is likely to require a particular type of cladding to be installed over a drained cavity.

7.3.3 When evaluated using the E2/AS1 risk matrix, the weathertightness features outlined in paragraph 7.3.1 show that the house demonstrates a high weathertightness risk rating. E2/AS1 would require a drained cavity for a high weathertightness risk for both these cladding types, however, though this was not a requirement at the time construction began in 2003, I note that the monolithic cladding has been installed over a cavity.

7.4 **Weathertightness performance**

7.4.1 Generally the components of the external envelope appear to have been installed in accordance with good trade practice. However, taking account of the expert's report, I consider that remedial work is necessary with respect to the following defects:

- there was an area of incomplete cladding at the junction of the foyer roof parapet and the external corner of a short return wall

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

- the air conditioning pipes through the concrete foundation wall are unsealed (E2/AS1 10.3.3).

7.4.2 I have noted the following compensating factors that assist the performance of the cladding in this particular case:

- apart from the defects noted in 7.4.1, the cladding is installed to good trade practice and the EIFS cladding is installed over a cavity
- there are no cracks in the cladding and a high standard of alignment and finish has been achieved
- there is no evidence that moisture is penetrating the external envelope.

7.4.3 With respect to the compliance of the roofs and balconies consideration is first given to E2/AS1. In some aspects the areas are not in accordance with E2/AS1. The fall of the entrance and family room roofs is less than 1° and some of the drains are smaller than E2/AS1 recommends. However, in this case there are a number of compensating factors to be considered.

- any drain blockage would be obvious
- ponding is very limited to two instances, one in the garage roof internal gutter and 2mm ponding to the foyer roof, with both instances away from seams
- the areas are small with the area of the decks being less than 13m² and roofs being 22m² and 34m² (E2/AS1 has a limit of 40m² for decks and none for the roofs)
- each area has a drain and overflow or run off over an edge and there are no indications of moisture ingress
- the size of outlets and overflows are generally less than in E2/AS1 but the areas of decks and roofs are small and so less capacity in this instance would appear adequate.

Therefore these areas can be considered to comply with Clause E2 as alternative solutions.

7.4.4 With respect to the authority's submission in response to the expert's report (refer to paragraph 5.9), I note that:

- with respect to the ground clearances of the cladding, the bottom plate is not exposed because the concrete has been cut away to ensure adequate slopes and any moisture will drain away from the bottom plate, and the front of the concrete has a rebate, ensuring the clearances are adequate
- the parapet top to the entry canopy has an inward slope and complies with Clause E2.

7.5 **Weathertightness conclusion**

7.5.1 I consider the expert's report establishes that the current performance of the external envelope is adequate as it is currently preventing water penetrating into the building. Consequently I am satisfied that the house complies with Clause E2 of the Building Code.

- 7.5.2 In addition, the building work is also required 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 the faults on the external envelope of the house may allow the ingress of moisture in the future, the building work does not comply with the durability requirements of Clause B2.
- 7.5.3 Because the faults identified with the external envelope occur in discrete areas, I am able to conclude that satisfactory rectification of the items outlined in paragraph 7.4.1 will result in the house being brought into compliance with Clause B2.
- 7.5.4 With respect to the authority's submission in response to the expert's report (refer to paragraph 5.9), I note that a compliance document is one way of establishing compliance with a particular clause of the Building Code. A design that complies with a compliance document must be accepted as complying with the provisions of the Building Code. However, complying with a Compliance Document is not the only means of complying and there may be alternative ways to comply with the Building Code.
- 7.5.5 Effective maintenance of claddings is important to ensure ongoing compliance with Clauses B2 and E2 of the Building Code and is the responsibility of the building owner. The Department has previously described these maintenance requirements, including examples where the external wall framing of the building may not be treated to a level that will resist the onset of decay if it gets wet (for example, Determination 2007/60).

8. Conclusion

- 8.1 The following table summarises conclusions on the items listed within the notice to fix dated 2 May 2008 and refers to related paragraphs within this determination:

Notice to fix		My conclusion about the remedial work required	Paragraph reference
Item	Summarised requirement		
2.1	Not in accordance with manufacturers specifications		
a	Entry roof parapet has insufficient fall	Fall is sufficient	5.6, 7.4.3
b	Lack of clearance of cladding to decks and roofs	Clearances sufficient	5.7.1
c	Lack of clearance of cladding to paving	Clearances sufficient	5.7.1
d	Cladding not continuous to behind fascia board	Cladding/fascia detail effective	5.7.1
e	Lack of drainage holes to sections of wall to allow drainage and ventilation of cavity	Drainage and ventilation sufficient	5.7.1
f	Incorrect sealing of junctions of window head flashing to bottom edge of cladding	Remedial work to remove sealing completed	5.7.1

g	Possible lack of sill flashing and incorrect sealing of bottom edge of window joinery to cladding	Flashings effective and remedial work to remove sealing completed	5.7.1
2.2	Not in accordance with acceptable solution of Building Code		
a	Insufficient provision of overflows to internal gutters and decks	Provisions are sufficient	5.6, 7.4.3
b	Lack of spreaders to downpipes discharging onto lower roof areas	Provisions are sufficient	5.6, 7.4.3
c	Scupper outlets through the parapets are of insufficient size	Provisions are sufficient	5.6, 7.4.3
2.3	Not in accordance with accepted trade practice		
a	Penetrations not sealed correctly with rubber flanges and silicon or flashings	Cladding penetrations well sealed, remedial work required to penetrations through concrete foundation wall	5.7.3
3.0	Not in accordance with Building Code		
a	Falls to roofs and balconies are less than 2.0° and do not shed precipitated moisture and in some cases allow ponding	Falls are sufficient	5.6, 7.4.3

8.2 I am satisfied that the building does not comply with the Building Code. In my opinion the authority made an appropriate decision to issue the notice to fix. Some of the items on notice to fix have been rectified and I am of the view that some items are adequate, so that the notice should now be modified (refer to 9.1).

9. What is to be done now?

9.1 The notice to fix should be modified and reissued to take into account the findings of this determination, including the remedial work that has been completed, and referring to any further defects that might be discovered in the course of investigation and rectification, but not specifying how these defects are to be fixed. It is not for the notice to fix to stipulate directly how the defects are to be remedied and the house brought into compliance with the Building Code. That is a matter for the owner to propose and for the authority to accept or reject. The notice to fix can require the owner to bring the house into compliance with the Building Code, but as noted in previous determinations, I consider that a notice to fix cannot specify how compliance is to be achieved.

9.2 I note that the authority has identified, in the notice to fix, a lack of clarity of the EIFS cladding as built details provided. I leave this matter to the authority to resolve with the applicants as it considers appropriate.

10. The decision

- 10.1 In accordance with section 188 of the Act, I hereby determine that the external envelope does not comply with Building Code Clause B2 and accordingly confirm the authority's decision to refuse to issue a code compliance certificate. I also determine that the authority is to modify the notice to fix, dated 2 May 2008 to take account of the findings of this determination.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 7 August 2009.

John Gardiner
Manager Determinations