



## Determination 2013/004

# Regarding the refusal to grant building consent for retrofitting foam wall insulation in a house at 3/30 Ngataringa Road, Devonport, Auckland

### 1. The matter to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“the Act”) made under due authorisation by me, John Gardiner, Manager Determinations and Assurance, Ministry of Business, Innovation and Employment (“the Ministry”), for and on behalf of the Chief Executive of the Ministry.

1.2 The parties to this determination are:

- Auckland Council, carrying out its duties and functions as a territorial authority or building consent authority (“the authority”). The authority is the applicant for this determination
- the owners of the house, Mr Z and Mrs S Jones (“the owners”) acting through Airfoam Wall Insulators (North Shore) Limited (“the insulation provider”) as their agent and who also represented the owners for the purposes of the building consent application.

1.3 Airfoam Wall Insulation Limited and Airfoam Wall Insulators (North Shore) Limited are both considered persons with an interest in this determination on the grounds of being the proprietary system provider and installer respectively. I have referred to both companies as “the insulation provider”. The insulation provider has also engaged a building advisory company as an adviser in this matter.

1.4 The determination arises from a decision made by the authority to refuse to grant a building consent for proposed building work that consisted of retrofitting urea formaldehyde foam insulation (“the insulation”) in the external walls of the owners’ house, because the authority was not satisfied on reasonable grounds that compliance with the Building Code (Schedule 1, Building Regulations 1992) had been demonstrated. The authority has requested a determination as to whether the proposed building work complies with the Building Code.

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<sup>1</sup> The Building Act, Building Code, Compliance documents, past determinations and guidance documents issued by the Ministry are all available at [www.dbh.govt.nz](http://www.dbh.govt.nz) or by contacting the Ministry on 0800 242 243.

- 1.5 Therefore, the matters to be determined<sup>2</sup> are:
- whether the authority correctly exercised its powers in refusing to grant a building consent
  - whether the proposed building work complies with the Building Code.
- 1.6 In considering these matters, I must consider whether there was sufficient evidence provided in the building consent application for the authority to conclude on reasonable grounds that the building work and the existing building (as altered) would comply with the Building Code to the extent required by the Act.
- 1.7 In making my decision on these matters, I have considered the submissions of the parties, and other evidence in this matter. I emphasise that each determination is conducted on a case-by-case basis.

## **2. The building work**

- 2.1 The owners' house was built sometime around the 1980s. It is a two-level detached townhouse, built on a concrete slab, with timber framing. The house is clad with fibre-cement planks, directly fixed to the framing, without the use of building paper. The planks are all in good condition and securely fixed, and have been painted. The house has aluminium joinery and is fully lined with plasterboard.
- 2.2 The building work consists of making a series of 25mm holes in the external walls and pumping insulation into the walls to improve the thermal performance of the house. The holes in the external walls are subsequently plugged and a drying regime is followed while the insulation cures.

## **3. The background**

- 3.1 On 5 July 2012 the insulation provider applied for a building consent on behalf of the owners to retrofit insulation into the walls of the owners' house. The application sets out the scope of the building work, stating that it consists of
- ... making a series of 25mm holes in the external walls and pumping the insulation into the walls to improve the thermal performance of the house. The holes to the external walls are subsequently reinstated, and a ventilation regime is followed while the foam cures.
- 3.2 The documents that were part of the building consent application, were
- a letter from the owners' lawyer as proof of ownership
  - a design summary, documenting how the building work and existing building would achieve compliance with clauses<sup>3</sup> B1, B2, C1, C2, C3, E2, F2, G9 and H1 of the Building Code. (Note that this design summary was a general summary of the product methodology and was not specific to the particular installation)

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<sup>2</sup> Under sections 177(1)(a), 177(1)(b) and 177(2)(a) of the Act.

<sup>3</sup> In this determination, unless otherwise stated, references are to sections of the Building Act and references to clauses are references to the Building Code.

- a building investigation report, completed following an inspection of the owner's house to determine if it was suitable to have insulation installed ("the inspection"). The report covered items relating to the performance of the existing building, including the electrical wiring, fire rated walls, fixed appliances and smoke alarms, structural stability, internal moisture and weathertightness
- a floor plan showing where invasive moisture testing would be carried out after installation and the positions of smoke alarms and windows
- drawings of the house's east, south and west elevations showing where insulation was to be installed
- a diagram summarising the insulation provider's compliance management process
- a weathertightness risk assessment completed using the E2/AS1 risk assessment matrix. The insulation provider concluded from this matrix that 'if this dwelling was built today...it would be considered suitable for a face-fixed cladding system'
- copies of previous related determinations, and documentation about a waterproof coating for brick claddings (which did not apply in this case).

3.3 In addition, the insulation provider noted a compliance management report would be filed with its application for a code compliance certificate for the building work. The report would include

- results from invasive moisture testing carried out to ensure construction moisture was dissipating
- evidence that the installation holes had been properly repaired
- evidence that installation had not affected the ongoing compliance of the building
- a copy of the insulation guarantee provided to the owners.

3.4 On 1 August 2012, the authority wrote to the insulation provider, who was acting on behalf of the owner, to request further information. The letter contained general information about methods for establishing compliance with the Building Code, and referred to two previous determinations relating to the insulation provider. With respect to the proposed building work the authority asked:

...what effect, if any, does [the insulation's ability to absorb moisture] have on the durability of other materials within the wall construction?

...[the insulation] has been used for a number of years around the country. How many issues have there been, if any, and if there were issues, what were they?

The authority concluded that it was 'unable to be satisfied that with the information provided to date, that [the insulation] will meet the provisions of the code'.

- 3.5 On 7 August 2012, the building adviser wrote to the authority on behalf of the insulation provider responding to the request for further information and seeking clarification of the ‘outstanding issues’ relating to the building consent application. The adviser noted that the authority’s letter did not meet ‘the intent of s50(b) of the Building Act as the information upon which the refusal was based was too general and did not relate directly to the property’. The adviser summarised previous correspondence between the parties and noted that the insulation provider intended to undertake ‘some in-service assessment to evaluate compliance with E2.3.5’.
- 3.6 On 8 August 2012, the building adviser emailed the Ministry on behalf of the insulation provider about the building consent application, noting that the insulation provider intended to commission ‘an assessment of houses where [the insulation] has been installed’ focussing on the effect of the installation on the buildings’ ongoing compliance with Clause E2.3.5.
- 3.7 It appears that over this time (and prior to it), the insulation provider and the building adviser attempted to establish what information the authority needed in order to be satisfied on compliance of the proposed building work. I have not been provided with notes from any discussions, or copies of this or any subsequent correspondence between the parties.
- 3.8 Although it is clear that the authority refused to grant a building consent for the proposed building work, from the information provided to me, it does not appear that the authority issued written notice of the refusal under section 50 of the Act.
- 3.9 The authority applied for a determination and the application was received by the Ministry on 5 October 2012.

#### **4. The submissions**

- 4.1 The application for a determination was accompanied by a submission from the authority dated 5 October 2012.
- 4.2 In its submission, the authority stated that it had refused to grant a building consent ‘as it could not be satisfied on reasonable grounds that the insulation material, the methodology and the process for the building work itself adequately demonstrated compliance with the Building Code’. The authority also stated that although the application related specifically to the proposed building work, ‘there is considerable interest among various parties through out the country regarding retrofitting urea formaldehyde foam insulation into wall framing and other wall cavities’ and that as a result the determination was ‘of significant national interest’.
- 4.3 The authority requested a determination be made about :
- whether the insulation provider’s ‘system for retrofitting insulation into wall framing and other cavities’ complies with clauses B1, B2, E2, E3, F2 and G9 of the Building Code
  - whether the proposed building work and the existing building as altered would comply with the Building Code to the extent required by the Act

- whether the authority was correct to refuse to grant the building consent.

4.4 The authority stated its specific concerns about the building work, which I have summarised as follows.

- Moisture – the authority is concerned about ‘large volumes of moisture trapped within the wall cavity over a long period of time’, this moisture coming from the installation process. In particular, the authority questions the effect of construction moisture on the framing, internal wall linings, external wall cladding, and fixings. Sustained high humidity has the potential to support mould and fungal growth. The authority also raised concerns about how any water that did penetrate the cladding would dissipate after the insulation had been installed, as it would reduce ‘moisture paths’ and ‘...all houses leak, and the introduction of wall insulation especially if there is not building paper can only worsen the situation’. Installation would involve making around 35, 25mm holes in the external cladding, and the authority did not believe the proposed method of repair would be weathertight.
- Fungal growth – fungal growth on wood products can cause significant health problems and ‘[m]ouldy wall cavity materials pose a potential threat to occupants since spores can migrate into living spaces’.
- Asbestos – ‘Asbestos based cladding systems...should not have holes drilled in them’, and the insulation provider has not commented whether or not this is an issue here.
- Formaldehyde – there can be an ‘issue with off-gassing’ from urea formaldehyde foam insulation. ‘With filling the wall-framing cavity with [the insulation], the walls become more airtight and have less ventilation to disburse the formaldehyde fumes’.
- Thermal performance – refers to previous determinations, which established that ‘clause H1 is not a consideration, provided the thermal performance of the building envelope is not reduced’, but is concerned about ‘some of the statements made by the advertising of [the insulation]’ and requests the Ministry to comment on this.
- Other considerations – ‘there appears to have been little research on the effects of installing [the insulation]’ and the authority is concerned about the potential scope of the problem if there is an issue with it.

4.5 The authority concluded that:

There are numerous unanswered questions to be satisfactorily addressed before [the authority] can be satisfied on reasonable grounds that the provisions of the Building Code would be met if the building work were properly completed in accordance with the plans and specifications that accompanied the application.

... the outcome of this determination is being eagerly awaited by various parties through out the country not just those named as a party to this determination. [The authority] is concerned that there is significant risk to the countries [sic] building stock if wet foam insulation is causative of future failures, as well as the potential health issues for those who occupy dwellings with this type of insulation.

- 4.6 With its submission the authority supplied copies of:
- the building consent documentation
  - Ministry guidance on Building Code compliance for retrofitting insulation in external walls<sup>4</sup>
  - two BRANZ study reports on the performance of urea formaldehyde foam insulation.
- 4.7 A further submission dated 8 October 2012 was made by the building adviser on behalf of the insulation provider. This letter referred to previous correspondence between the building adviser and the authority, and the building adviser and the Ministry (see paragraphs 3.5 and 3.6 respectively), and asked that this also be taken into account. The adviser stated that the authority was failing to meet its obligations under section 50 of the Building Act, in that it had failed to ‘go through the process associated with considering a building consent application’ and that the authority’s application for a determination was an extension of this. The building adviser supplied copies of:
- the building consent documentation
  - correspondence between the parties and with the Ministry.
- 4.8 A draft determination was issued to the parties for comment on 10 December 2012. Both parties accepted the draft without further comment or submissions in responses dated 20 December 2012.

## **5. Approach for assessing the matters to be determined**

- 5.1 The matters for determination are whether the proposed building work complies with the Building Code and whether the authority correctly exercised its powers in refusing to grant building consent. In considering these matters, I must consider whether there was sufficient evidence provided in the building consent application for the authority to conclude on reasonable grounds that the building work and the existing building (as altered) would comply with the Building Code to the extent required by the Act.
- 5.2 I have issued a number of determinations about the requirements of the Act, as they relate to alterations to existing buildings, including repairs and remedial work. These determinations include 2010/140, 2010/139, 2010/080, 2011/117, 2012/026 and 2012/027. The Ministry has also issued guidance under section 175 of the Act on Building Code compliance for retrofitting insulation in external walls that is relevant to this determination.
- 5.3 As established in the earlier determinations (2012/026 and 2012/027), the Building Code obligations for the building work are:

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<sup>4</sup> Department of Building and Housing. (2011). *Guidance on Building Code compliance for retrofitting insulation in external walls*. Available on the publications section of the Ministry’s Building and Housing website <http://www.dbh.govt.nz/publications>.

**Clause B2 (B2.3.1)**

- compliance with Clause B2, with respect to the other Code clauses

**Clause E2 (E2.3.2, E2.3.6)**

- compliance with Clause E2.3.2, with respect to the installation holes made in the exterior cladding
- compliance with Clause E2.3.6, with respect to the dissipation of the excess moisture present at the completion of construction

**Clause F2 (F2.3.1)**

- compliance with Clause F2.3.1, with respect to the installation of the insulation and its ongoing effects.

5.4 The relevant Building Code obligations and the components of the building they relate to, with respect to the compliance of the existing building to the same extent as before (as required by section 112) are:

**Clause B1 (B1.3.1)**

- the structural performance of the framing is not reduced, with respect to the accumulated moisture causing damage to the framing (relates to Clause E2)
- the structural performance of claddings and internal linings (for withstanding normal loads in use and providing bracing units where relevant) is not reduced

**Clause B2 (B2.3.1)**

- the durability of the building elements is not reduced, with respect to the extent that other performance requirements apply

**Clause C2 (C2.2)<sup>5</sup>**

- insulation must not cover appliances that generate heat or be positioned so as to cause undue heat to build up in adjacent building elements
- insulation should be installed at a sufficient distance from appliances and other fixed equipment to ensure its surface temperature does not exceed 90° C

**Clause C3 (C3.7)**

- the compliance of any fire rated walls must not be detrimentally affected

**Clause E2 (E2.3.2, E2.3.5)**

- the ability of the external wall to prevent the penetration of water that could cause undue dampness or damage must not be reduced
- the ability of the concealed space or cavity to prevent external moisture being accumulated or transferred must not be reduced

**Clause G9 (G9.3.1)**

- the compliance and continued safety of the electrical wiring must not be detrimentally affected

<sup>5</sup> Clause C1-C4 of the Building Regulations 1992 were replaced on 10 April 2012 by Clauses C1-C6 of Regulation 6 of the Building (Building Code: Fire Safety and Signs) Amendment Regulations 2012 (SR2012/33). Clauses C1-C4 of the 1992 regulations remains in force (alongside the new regulations) until April 2013.

**Clause H1 (Clause H1.3.1, H1.3.2E)**

- the thermal performance of the building envelope must not be reduced.

**6. Whether the authority correctly exercised its powers in refusing to grant building consent**

6.1 In order to consider the authority's decision to refuse to issue the building consent, I need to take into account the requirements for building consent applications in terms of section 45 and section 49 of the Act.

6.2 Section 49 states that an authority 'must grant a building consent if it is satisfied on reasonable grounds that the provisions of the building code would be met if the building work were properly completed in accordance with the plans and specifications that accompanied the application'.

6.3 In terms of the basic information required to support an application for building consent, section 45 of the Act states:

- 45 How to apply for a building consent
- (1) An application for a building consent must–
- (a) be in the prescribed form; and
  - (b) be accompanied by plans and specification that are –
    - (i) required by regulations made under section 402; or
    - (ii) if the regulations do not so require, required by a building consent authority; and
  - (c) contain or be accompanied by any other information that the building consent authority reasonably requires; and
- ...

6.4 The Act provides for an authority to set reasonable requirements for the documentation that accompanies applications for building consents. An authority is entitled to set minimum requirements to ensure that the proposed building work is clearly documented and to require designers to clearly demonstrate and document how compliance with the Building Code is to be achieved.

6.5 That said, the Act makes specific requirements of both an applicant and an authority when building consent is being sought; the applicant is required to provide sufficient relevant information to clearly describe the proposed work, and if the application is not adequate the authority must clearly articulate the reasons for an application being refused.

6.6 Section 50 of the Act sets out the requirements when an authority refuses to grant an application for a building consent.

- 50 Refusal of application for building consent
- If a building consent authority refuses to grant an application for a building consent, the building consent authority must give the applicant written notice of–
- (a) the refusal, and
  - (b) the reasons for the refusal.

- 6.7 It is important that when a building consent is refused the applicant is given clear and appropriate reasons why. It is not the authority's role to make value judgments about a product's efficacy and cost-effectiveness and to prevent owners from undertaking building work that they wish to carry out. It is the authority's role to apply the statutory tests in the Act, and ensure that building work that is carried out complies with the requirements of the Act and the Building Code.
- 6.8 I note that section 48(3) refers to specific matters that an authority must take into account, being any memorandum from the New Zealand Fire Service Commission, and any warning or ban on building products or methods to be used when considering the application. If a ban has been imposed, a building consent cannot be granted.
- 6.9 In my view, the particular aspects of the proposed building work should be identified that do not comply or for which there is insufficient evidence to demonstrate compliance. The owner can either then take the appropriate action, or apply for a determination if the reasons are disputed.
- 6.10 In the current case, the authority has neither notified the owners in writing of its decisions to refuse their application, nor provided reasons for that refusal. Instead, it appears to have progressed directly from its request for more information dated 1 August 2012 (which appears to have been responded to) to its application for a determination (which cannot be considered a refusal in terms of section 50 of the Act).
- 6.11 In addition, the authority appears to be applying a blanket policy with respect to the insulation provider's products and operations, rather than turning its mind to the compliance of this building work and its impact on the existing building. Under the Act, the authority is required to consider this proposal from the owners, and consider any other proposals relating to this product, rather than apply a blanket or 'unilateral' refusal to issue building consents. The power to issue a unilateral decision to refuse to grant building consents for particular products or systems is not within the ambit of powers of a building consent authority under the Act.
- 6.12 Compliance of this system has been the subject of a number of previous determinations (refer to paragraph 5.2) and the Ministry has issued guidance on the retrofitting of insulation. This would have provided a useful framework for the authority to apply the tests it needs to apply under the Act. While this does not mean it should have granted building consent, taken together, this provides a good framework for the authority to make a decision.
- 6.13 I am therefore of the view that the authority has failed to comply with section 50 of the Act, and has not correctly exercised its powers in refusing to grant the building consent.

## 7. Whether there is sufficient evidence to conclude retrofitting insulation complies with the Building Code to the extent required by the Act

7.1 In order to form a view about whether there is sufficient evidence provided in the building consent application for the authority to conclude on reasonable grounds that the building work and the existing building as altered would comply with the Building Code to the extent required by the Act, I have taken account of the regulatory requirements for alterations to buildings as I described in paragraph 5 and the evidence provided in the building consent application.

### 7.2 The building work

7.2.1 The following table compares the evidence provided in the building consent application with the relevant Building Code obligation for the building work.

Building Code obligation	Requirement	General information provided	Building work specific information provided
Clause E2.3.2	Roofs and exterior walls must prevent the penetration of water that could cause undue dampness, damage to building elements or both	<p>'Sealing the 25mm holes once curing process complete.'</p> <p>'For brick veneer homes – owner will be required to coat bricks with appropriate waterproofing agent once curing process complete.'</p> <p>'For all other claddings, surface will be primed.'</p>	<p>'A building work compliance report will be provided when an application for a CCC is made. This report will provide...</p> <p>photographic evidence that the installation holes have been appropriately sealed and primed...'</p>
Clause E2.3.6	Excess moisture present at the completion of construction must be capable of being dissipated without permanent damage to building elements.	<p>'Moisture probes will be installed on slowest drying elevation to track dissipation of construction moisture.'</p> <p>'Where a probe is unable to be installed, holes will be drilled to enable reading of the moisture content.'</p>	<p>'A building work compliance report will be provided when an application for a CCC is made. This report will provide:</p> <p>Moisture probe readings to demonstrate that construction moisture is dissipating...'</p>
Clause F2.3.1	The quantities of gas, liquid, radiation or solid particles emitted by materials used in the construction of buildings, shall not give rise to harmful concentrations at the surface of the material where the material is exposed, or in the atmosphere of any space.	'Owner advised of ventilation requirements. Stickers will be placed on appropriate windows, installer checks 1 week post installation for any evidence of smell.'	'Owner understands ventilation requirements during curing'.

7.2.2 With respect to Clause E2.3.2, I am satisfied that the process generally described in the building consent application to make good the penetrations of the external cladding is acceptable. However, I am aware from documentation provided to me in relation to another determination application, that the insulation provider now has an

up-to-date operational procedure for sealing exterior installation holes. The authority should be provided with this information in a consolidated way as a part of the building consent application.

7.2.3 With respect to Clause E2.3.6, I am satisfied that the process described for monitoring post-construction moisture levels is acceptable. I have been able to arrive at this conclusion as the relevant documentation had been provided to me in relation to another determination application. However I note that the authority has not been provided this information. This information should be provided in a consolidated way as a part of the building consent application.

7.2.4 With respect to Clause F2.3.1, I am satisfied that the process described in the building consent application material is acceptable. I have been able to arrive at this conclusion as the relevant documentation had been provided to me in relation to another determination application. However I note that the authority has not been provided with this information: it should be provided in a consolidated way as a part of the building consent application. I also note that previous determinations found that there should be a clear procedure for what will happen if there are any post-installation issues with smell indicating formaldehyde levels are not returning to ambient house levels.

### 7.3 The existing building (as altered)

7.3.1 The following table compares the evidence provided in the building consent application with the relevant Building Code obligation for the existing building (as altered).

Building Code obligation	Requirement as relating to the compliance of the existing building as required by section 112	General information provided	Building specific information provided
Clause B1.3.1 for external wall framing, external cladding and internal linings (bracing and normal loads)	The structural performance of the framing is not reduced, with respect to the accumulated moisture causing damage to the framing (relates to Clause E2)  The structural performance of claddings and internal linings (for withstanding normal loads in use and providing bracing units where relevant) is not reduced.	'Pre installation investigation undertaken with owner to establish current performance of existing building. Where potential issues exist, then the owner will be required to address these.'	'Plasterboard fully completed with paint and wall paper over linings'.  ' No evidence of internal leaks were evident.'
Clause C2.2 for appliances	Insulation should be installed at a sufficient distance from appliances and other fixed equipment to ensure its surface temperature does not exceed 90°C.	'Appliances will be identified during the pre installation report and foam installation plan amended accordingly.'	No fixed appliances were identified.

Clause C3.7 for fire rated walls	The compliance of any fire rated walls must not be detrimentally affected.	'Existence of any fire rated walls will be established during the pre installation report and these walls will not have foam installed.'	No firewalls were identified.
Clause E2.3.2 and Clause E2.3.5 for the external wall and cladding system	The ability of the external wall to prevent the penetration of moisture that could cause undue dampness or damage must not be reduced.  The ability of the concealed space or cavity to prevent external moisture being accumulated or transferred must not be reduced.	'[The inspection] will identify whether any potential issues exist in which case owners will be required to address them.'  'For brick veneer homes – owner will be required to coat bricks with appropriate waterproofing agent once curing process complete.'	'Two level town house...[fibre-cement] plank clad...on concrete slab.'  'No visible signs [of external leaks]. All flashings and penetrations appear to be satisfactory.'  'All [fibre-cement] planks are in good condition. 'There is no evidence of rot or mould.' 'All [fibre-cement] planks appear to be securely fixed'. 'The existing paint appears to be aged but in OK condition.' 'The [fibre-cement] plank cladding has normal acrylic house paint over it, which I understand is permeable to moisture.'  Ground clearances are '25–50cm from ground to concrete floor level...'  Aluminium joinery, with 'No water staining evident. No internal damage identified.'
Clause G9.3.1 for the electrical wiring	The compliance and continued safety of the electrical wiring must not be detrimentally affected.	'[The inspection] to establish that only PVC coated wiring is present.'  'No evidence of plasticization.'	'All wiring is PVC only'.
Clause H1.3.1 and Clause H1.3.2E for the thermal performance of the building	The thermal performance of the building envelope must not be reduced.	'Installation of [the insulation] will improve the thermal performance of the building envelope...'	

7.3.2 With respect to Clause B1.3.1 for external wall framing, external cladding and internal linings (bracing and normal loads), I accept that the inspection and the process of assessing the suitability of walls for the insulation will enable any issues that may adversely affect the drying ability of the insulation to be identified and installation into unsuitable locations to be avoided. I also note that the fungicides present in the insulation provide a compensating feature. However, the structural performance may be affected by excessive or prolonged moisture being present in the cavity. Therefore, confirmation that excess moisture present at the completion of construction has dissipated should be provided prior to the issue of a code

compliance certificate (also refer to paragraphs 7.2.2 and 7.2.3). The insulation provider has undertaken to provide this.

- 7.3.3 With respect to Clause C2.3, I consider that the inspection has adequately considered the location of any fixed appliances and none have been identified.
- 7.3.4 With respect to Clause C3.7, I am satisfied that the inspection adequately considered the existence of any firewalls.
- 7.3.5 With respect to Clauses E2.3.2 and E2.3.5, I am satisfied that the inspection has adequately considered the effect of the proposed building work on the external envelope in this case. See also paragraph 7.2.2 and my finding that the process to make good the penetrations of the external cladding is acceptable.
- 7.3.6 With respect to Clause G9.3.1 for the electrical wiring, I am satisfied that the inspection has adequately considered the effect of the proposed building work to the existing wiring.
- 7.3.7 With respect to Clause H1.3.1 and Clause H1.3.2E, I am satisfied that the installation of the insulation will not make the thermal performance of the building worse. As described in previous determinations, there is evidence that the thermal performance of buildings is improved through the retrospective installation of insulation. However, the extent to which this is achieved will depend on the effectiveness and durability of the installation and possible shrinkage of the insulation in the wall. I note here that the authority has requested that I ‘comment’ on the insulation provider’s ‘advertising’ statements about the thermal performance of its products. In my view, this is a matter for the Commerce Commission, and does not come within the functions of a determination.

#### **7.4 Compliance with Clause E2.3.5**

- 7.4.1 In its submission, the authority raised several concerns about the ongoing effect that the proposed building work will have on moisture in the external wall cavities. Of particular concern was the ability of the insulation to transmit, absorb or trap any moisture that may penetrate the external cladding.
- 7.4.2 The building adviser, on behalf of the insulation provider, has indicated the insulation provider’s intention to undertake ‘in service’ testing of houses where insulation has already been installed to demonstrate the buildings’ ongoing compliance with Clause E2.3.5 over time. Such testing would undoubtedly be useful for helping to demonstrate compliance, although it may not be necessary in the current case.
- 7.4.3 The insulation provider submitted an assessment that the owners’ house is at low risk of non-compliance with Clause E2. I accept that the insulation provider has put forward a number of factors that support this. The house and cladding are well ventilated and maintained, the external framing is treated, and there are no signs of leaks.

- 7.4.4 I also accept that the installation of the insulation will not increase the risk of non-compliance with Clause E2.3.5. The insulation is open-cell foam and does not readily absorb water. Post-installation shrinkage will mean that there is still capacity for any water that does penetrate the external cladding or internal linings to dissipate. Because of the age of the house and the type of cladding used, there will still be sufficient ventilation for this to occur. Post-installation monitoring will ensure that any construction moisture is dissipated.
- 7.4.5 I note that building paper has not been used under the external cladding and this increases the potential risk for water ingress and transfer.
- 7.4.6 I also note that fibre-cement cladding is more brittle, and hence prone to cracking, than some other plank-style claddings, however, it is also more apparent when this occurs, enabling easy detection and repair. When properly installed and maintained (as is the case here), fibre-cement cladding presents an effective barrier against water ingress, even in the absence of building paper. I note that the reinstatement of the installation holes is important; however, as described in paragraph 7.2.2, I am satisfied that the process generally described in the building consent application to make good the penetrations of the external cladding is acceptable.
- 7.4.7 I note that the house has been assessed as having an overall low risk score in terms of the E2/AS1 weathertightness risk matrix. It is not clear to me whether other characteristics such as the high rainfall and high humidity in the region and the impact on compliance with E2.3.5 have been considered.
- 7.4.8 On balance, it does appear to me that the requirements would be met; to not reduce the ability of the external wall to prevent the penetration of moisture that could cause undue dampness or damage, and to not reduce the ability of the concealed space or cavity to prevent external moisture being accumulated or transferred.
- 7.4.9 However, I don't believe that this was sufficiently demonstrated in the building consent documentation, and further substantiation is needed to verify that the requirements would be met. The insulation provider should provide more information about whether any of the factors that increase the risk of non-compliance with Clause E2.3.5 are critical in this case.

## **7.5 The information provided**

- 7.5.1 Previous determinations<sup>6</sup> have described the need for a thorough inspection, a report describing the factors affecting the building, and an analysis of how these affected compliance and the decision-making process, as well as a description of any processes used during or after installation (e.g. installation around heat generating devices, reinstatement of the external cladding where installation holes were made, ventilation of the building, post construction moisture monitoring etc).
- 7.5.2 The insulation provider has carried out an inspection of the house and supplied a report on the inspection as part of its building consent application documentation. I am satisfied that this report is adequate, and that the inspection it was based on thoroughly conducted, and that as a result all relevant aspects of the house have been

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<sup>6</sup> Determinations 2012/26 and 2012/27.

considered. This has enabled the insulation provider to assess whether the house is suitable to have insulation installed and plan how issues potentially affecting Building Code compliance will be addressed.

- 7.5.3 I am of the view that there are still some gaps in the supporting documentation that describe the processes described in the inspection report and the 'design summary'. The design summary is a useful document for summarising how Building Code compliance is to be demonstrated and the relevant processes that are to be used, although I note that it is not a design summary as such as it is not particular to the building in question. The documentation provided for the building consent application should be provided in a consolidated way and support the material provided in the 'design summary' and inspection report, and provide evidence about the processes to be carried out.
- 7.5.4 It is not necessary for the entire manual to be provided for a building consent application, however, the insulation provider needs to bring together the information that is relevant to demonstrate Building Code compliance. Any information provided that relates to the insulation provider's manual should be the current version of the manual.
- 7.5.5 I am therefore of the view that there was not sufficient evidence provided in the building consent application for the authority to conclude on reasonable grounds that the building work and the existing building as altered would comply with the Building Code to the extent required by the Act.

## **8. What is to be done now**

- 8.1 I suggest that the building consent application should be modified and resubmitted to the authority, taking into account the findings of this determination.
- 8.2 In particular, the insulation provider should take into account the comments in this and other determinations about the nature of the documentation required to support applications for building consents (see paragraph 7.5). Until the shortcomings in the documentation are satisfactorily resolved, the authority is entitled to refuse to grant building consent on the basis that, without adequate documentation, it cannot be satisfied on reasonable grounds that the provisions of the Building Code will be met if the proposed building work is completed in accordance with the plans and specifications that accompanied the application for the building consent.
- 8.3 Once the modified application is submitted, the authority should comply with its obligations under the Act, and use where necessary previous determinations and Ministry Guidance in making its decision.

## **9. Decision**

9.1 In accordance with section 188 of the Act, I hereby determine that:

- the authority incorrectly exercised its powers in refusing to grant the building consent in respect of the requirement under section 50 of the Act to give the applicant written notice of the refusal and reasons for the refusal
- there is currently insufficient information to provide reasonable grounds that the proposed building work complies with the Building Code, and accordingly I confirm the authority's decision to refuse to grant the building consent.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 28 January 2013.

John Gardiner  
**Manager Determinations and Assurance**