

# Determination 2010/71

## Durability requirements for meter boxes installed in three brick-clad houses at Franz Josef Glacier, Westland

### 1. The matter to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act<sup>1</sup> 2004 (“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 Westland District Council (“the BCA”). I have included Aotea Electric Westland (“the electrician”) as a person with an interest in the matter, acting through the Canterbury & Westland Branch of the ECANZ<sup>2</sup> (“the agent”).
- 1.2 This determination arises from the decision of the BCA that galvanised meter boxes fitted into the brick cladding of three houses did not meet the durability requirements of the Building Code (Schedule 1, Building Regulations 1992).
- 1.3 The matter to be determined, in terms of section<sup>3</sup> 177(a) of the Act, is therefore whether the galvanised meter boxes comply with the requirements of Building Code Clause B2 Durability.
- 1.4 In making my decision, I have considered the submissions of the parties, the requirements of the Act and the Building Code, the relevant New Zealand Standard, and the other evidence in this matter.

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

<sup>2</sup> Electrical Contractors Association of New Zealand

<sup>3</sup> 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 work

- 2.1 The building work consists of the installation of galvanised electrical meter boxes into three houses clad with brick veneer (“the brick cladding”). The houses are generally constructed of conventional light timber framing with brick veneer cladding, and are located in a medium wind zone for the purposes of NZS 3604<sup>4</sup>.
- 2.2 The meter boxes are fixed to the exterior framing of the houses with the brick cladding butted up to the perimeter of the boxes on four sides. The meter boxes are accessible from the front via a cabinet door.

## 3. Background

- 3.1 The electrician was awarded a three-house contract to install wiring and other electrical fittings, including the electrical meter boxes.
- 3.2 Following an inspection of the work by the BCA, the electrician was advised that the meter boxes as installed did not meet the durability requirements of the Building Code, and that they would need to be replaced with an improved durable product.
- 3.3 Sometime during 2008, following negotiation between the parties, the brick veneer cladding around the meter boxes was removed and reinstated. The opportunity was taken to apply a paint coating to the meter boxes.
- 3.4 In a letter to the BCA dated 25 November 2008, the agent stated that:

A member of the Canterbury and Westland Branch of the Electrical Contractors Association of New Zealand ... was advised by your building inspector that the galvanised meter boxes fitted did not meet the durability requirements of the building code and same would have to be replaced with an improved durable product.

The agent requested clarification of the ‘[BCA’s] Meter Box Specification’, and explained that

Following negotiation ... the contractor had the ‘block work” removed from around the boxes and applied a paint coating to same.

As other [BCAs] are allowing the installation of the galvanised meter boxes without any additional treatment, we make a request that you provide us with the relevant building code requirements.

- 3.5 The BCA replied to the agent in a letter dated 4 December 2008, stating that:
- ... you are referred to Acceptable Solution 1.2.1 (a) which relates to assessment criteria for durability. Figure 1 which immediately follows Part 1.2.1 (a) clearly requires a durability requirement of 50 years.
- ... Table 1 of [B2/AS1 requires] that electrical work that includes fittings that are concealed and moderately difficult to access or replace shall have a functional life of not less than 50 years. ... [Table 1 requires] flashings such as those that are hidden behind veneer, stucco or spandrel panels, the durability shall be not less than 50 years.

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<sup>4</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

In addition, the BCA said:

... the galvanised meter boxes that are set in to a brick veneer become an essential component of the wall and are, accordingly, unable to be readily replaced. They must have the same durability as the surrounding building elements.

3.6 In a letter to the meter box manufacturer dated 25 November 2008, the agent requested clarification of the manufacturer's specification and the durability life for the galvanised meter boxes in question. The manufacturer responded in a letter dated 27 November (assumed 2008) that the meter boxes are manufactured to NZS 6206<sup>5</sup>, and that the service life of the meter boxes is at least 20 years, as stated in paragraph 5.2 of that Standard.

3.7 The agent made a formal complaint to the Department about the BCA on 1 July 2009, in which the agent expressed concern about the BCA's treatment of galvanised meter boxes in respect to the durability requirements stated in the Building Code. The Department acknowledged receipt of the respondent's formal complaint form in a letter to the respondent dated 8 July 2009, and advised the applicant in a letter dated 9 July 2009 that the complaint had been received.

3.8 The BCA responded to the Department's correspondence in a letter dated 27 July 2009. In this letter, the BCA stated that it had:

... not chosen to disallow the practice of installing galvanised meter boxes but [require] that they be able to be replaced without having ... the difficulty of access. The way in which the meter boxes at Franz Josef were installed was such that there was no possibility that they would be able to be removed without demolishing the brick veneer because of the various entry and exit points of wires and the manner of the attachment of the meter boxes to the framework.

In addition, the BCA said that:

The issue has always been the manner of installation [of the meter boxes] rather than the quality of the product.

3.9 Following clarification of who could be a party to the matter under section 176 of the Act, the Department received the application for a determination on 7 April 2010.

## **4. The submissions**

4.1 The agent forwarded copies of:

- the correspondence with the manufacturer
- the correspondence the Department.

4.2 The draft determination was issued to the parties for comment on 24 June 2010.

4.3 The BCA responded to the draft determination in a submission to the Department dated 13 July 2010. The submission said the draft was not accepted, and the following matters were raised, in summary:

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<sup>5</sup> New Zealand Standard NZS 6206: 1980 Specification for Domestic Electric Meter Boxes

- The statement in the draft that the brickwork was removed in order to paint the meter boxes was incorrect. The BCA advised that the brickwork was removed because the brickwork was ‘completed to an unacceptable standard’.
- It was contended that the draft determination ‘assumes the meter boxes are surface mounted’. If the meter boxes had been surface mounted the BCA would have considered them ‘moderately difficult’ to replace.
- The replacement of a meter box required the involvement of three separate trades.
- Brick veneer was a form of masonry, which in Clause 1.2.1(a) of B2/AS1 had a required durability period of 50 years. The BCA considered the meter boxes were ‘difficult to replace’.

4.4 The agent responded to the draft determination in a letter to the Department dated 5 August 2010. The agent accepted the draft determination and disagreed with the submission of the BCA. The agent noted the following matters, in summary:

- The agent did not believe the bricks were classed as masonry, saying ‘it takes very little work to remove brickwork ...’.
- The agent had experience of replacing meter boxes ‘without disturbing the brickwork around them.’
- Replacing a meter box ‘is no different to replacing a shower in a house, where three or more trades could be involved. A shower is only classed under B2.3.1(c) for 5 years.’
- Meter boxes were ‘moderately difficult to replace’.
- The agent would make sure the association’s membership would be made aware ‘that galvanised steel meter boxes require painting in any situation where cement water run-off may occur.’

4.5 I have considered the parties submissions and amended the determination as appropriate. In response to the second bullet point in paragraph 4.3, paragraph 6.3.1 quotes from Table 1 of B2/AS1. The paragraph 6.3.1 does not say that meter boxes are surface mounted.

## 5. The legislation and the relevant standard

5.1 The relevant provisions of Building Code Clause B2 include:

**B2.3.1** *Building elements* must, with only normal maintenance, continue to satisfy the performance requirements of this code for the lesser of the *specified intended life* of the *building*, if stated, or:

- (a) The life of the building, being not less than 50 years, if:
  - (i) Those building elements (including floors, walls, and fixings) provide structural stability to the building, or
  - (ii) Those *building elements* are difficult to access or replace, or
  - (iii) Failure of those *building elements* to comply with the *building code* would go undetected during both normal use and maintenance of the *building*.

- (b) 15 years if:
  - (i) Those building elements (including the building envelope, exposed plumbing in the subfloor space, and in-built chimneys and flues) are moderately difficult to access or replace, or
  - (ii) Failure of those building elements to comply with the building code would go undetected during normal use of the building, but would be easily detected during normal maintenance.
- (c) 5 years if:
  - (i) The building elements (including services, linings, renewable protective coatings, and fixtures) are easy to access and replace, and
  - (ii) Failure of those building elements to comply with the building code would be easily detected during normal use of the building.

5.2 The relevant provision of the Acceptable solution for Clause B2, B2/AS1, includes the following:

**Paragraph 1.2.1** Evaluation of building elements shall be based on the following concepts:

**a) Difficult to access or replace** – applies to building elements where access or replacement involves significant removal or alteration of other building elements. Examples are works involving the removal of masonry or concrete construction, or structural elements or repair of buried tanking membranes. A 50 year durability is required.

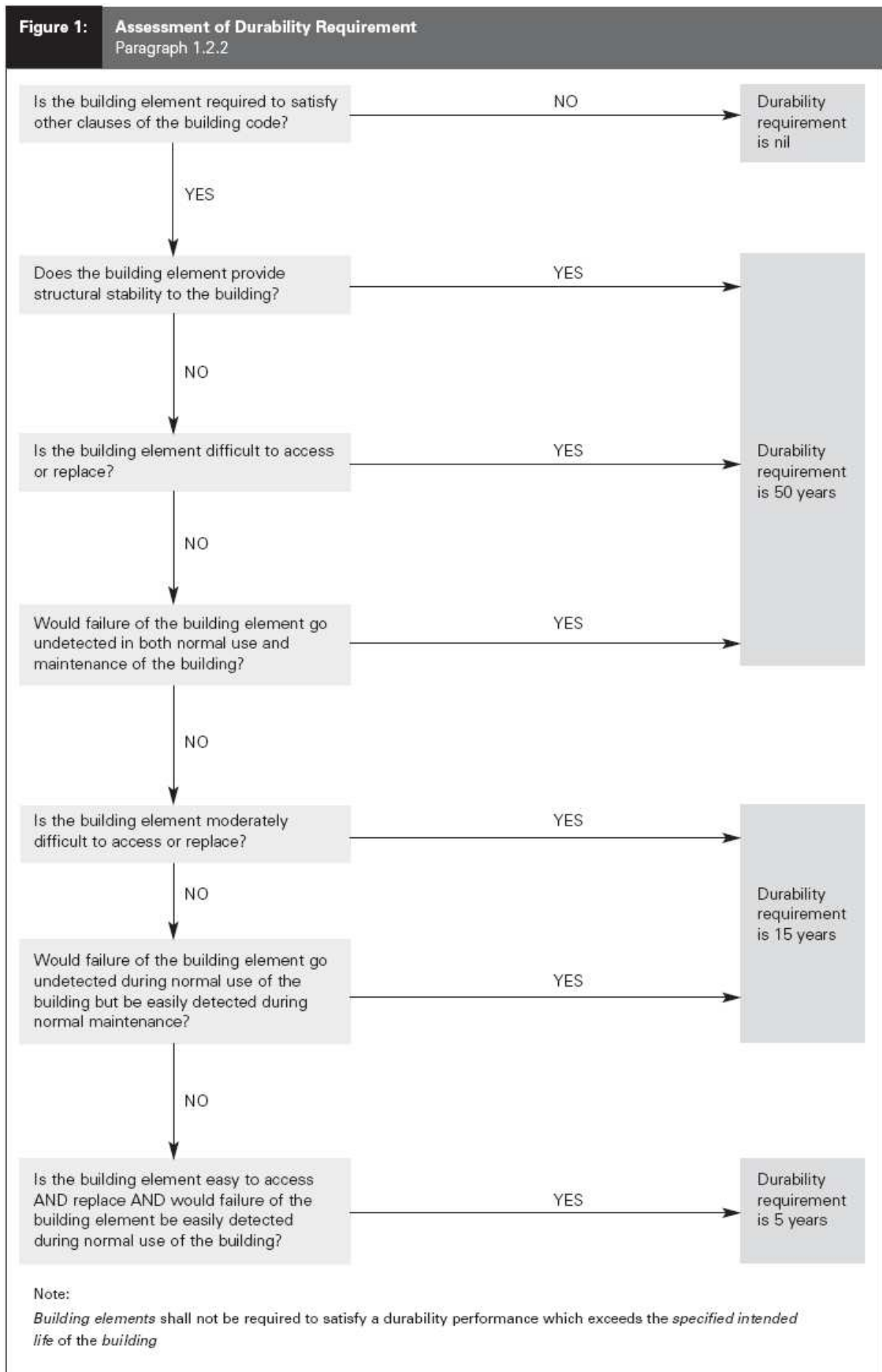
**b) Moderately difficult to access or replace** – applies to building elements where access or replacement involves the removal or alteration of other building elements. Examples are the replacement of services reticulation in wall cavities and skillion roofs, or of plant and hotwater cylinders built into roof spaces without adequately sized access openings. A 15 year durability is required.

**c) ...**

The following excerpts from Table 1 of B2/AS1:

<b>Table 1: Durability Requirements of Nominated Building Elements</b>		Note: Clause B2.3.2 requires that all hidden elements have at least the same durability as that of the element that covers it (i.e. must have the same expected life) which may be more than the requirement in clause B2.3.1. For example, the reason that a brick tie has a requirement of not less than 50 years in this table, instead of the 15 year requirement for <i>cladding</i> , is that the brick veneer that hides it has an expected durability of 50 years or more.			
<b>Building Element</b>	<b>Component</b>	<b>Situation/Function</b>	<b>Not less than 50 years</b>	<b>Not less than 15 years</b>	<b>Not less than 5 years</b>
<b>Electrical work</b> (See note at top of table)	Wiring	Buried in or under concrete slabs or behind structural linings without ducts	✓		
		Concealed behind linings or in complex ducts or conduit, or surface mounted in conduit		✓	
		Wires in easy to access ducts			✓
	Fittings	Concealed and moderately difficult to access or replace	✓		
		Surface mounted			✓

**Figure 1 from B2/AS1:**



5.3 The relevant provision of the Acceptable solution for Clause E2, E2/AS1, includes the following:

#### 4.2.4 Surrounding materials

Metals which are in contact in locations where they will become wet, or where water can flow over metals or certain plastics onto another metal, shall be selected in accordance with Table 21 and Table 22. Uncoated metals shall not be used where carbon deposits or chemical contaminants may accumulate.

**Table 22: Compatibility of materials subject to water runoff**

(Excerpt from table with entry for clay bricks with cement mortar highlighted)

<b>Table 22: Compatibility of materials subject to run-off</b>	
This table shall be read in conjunction with Table 20 and Table 21. Refer relevant <i>cladding</i> and <i>flashings</i> paragraphs for material and coating specifications. Paragraphs 2.2 c), 4.2.4, 4.4, 4.5.2 a), 8.2.4, 8.4.11 a) and c), and 9.8.5	
Material that water flows onto	Material that water flows from
	Aluminium, anodised or mill-finish
	Aluminium, coated <sup>(1)</sup>
	Butyl rubber & EPDM
	CCA-treated timber <sup>(2)</sup>
	Cedar
	Cement plaster (uncoated)
	Ceramic tiles (cement grout)
	Clay bricks (cement mortar)
	Concrete old (unpainted)
	Concrete green (unpainted)
	Copper/brass
	Glass
	Glazed roof tiles
	Lead (including lead-edged) unpainted
	Plastics
	Stainless steel
	Steel, galvanised coil-coated
	Steel, galvanised (unpainted)
	Zinc
	Zinc/aluminium coated <sup>(1)</sup>
	Zinc/aluminium, (unpainted)
Clay bricks (cement mortar)	x
Clay bricks (cement mortar)	x
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	A
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	x
Clay bricks (cement mortar)	x
Clay bricks (cement mortar)	✓
Clay bricks (cement mortar)	x

**LEGEND:**

- ✓ Materials satisfactory with water run-off as indicated.
- x Water run-off is not permitted as indicated.
- A Etching or staining of glass may occur with run-off.

**NOTES:**

(1) Coated – includes factory-painted, coil-coated and powder-coated.

(2) Includes copper azole and copper quaternary salts.

5.4 Clause 5.1 of New Zealand Standard NZS 6206: 1980 Specification for Domestic Electric Meter Boxes states that:

The materials used in the construction of the meter box and its cover ... shall be such as to give a service life of at least 20 years without maintenance.

## 6. Discussion

6.1 The BCA has concerns regarding the durability, and hence the compliance with the Building Code, of the electrical meter boxes installed in the houses.

## 6.2 The cladding

6.2.1 Claddings are, in general terms, required to meet a durability period of 15 years, and in my view this also applies to the brick veneer.

6.2.2 Paragraph 1.2.1(a) of B2/AS1, describes building elements which are considered 'difficult to access or replace' and for which a 50-year durability is required, being:

... building elements where access or replacement involves significant removal or alteration of other building elements.

Paragraph 1.2.1(a) also quotes examples of such elements as:

... works involving the removal of masonry or concrete construction, or structural elements ...

6.2.3 I do not consider that the term 'masonry' as it can be used in 'masonry veneer' falls into the same category as 'masonry or concrete construction', which has primarily a structural function as referred to in 1.2.1(a) of B2/AS1. The brick veneer cladding is not a structural element, nor does its removal involve the removal of other building elements.

6.2.4 The removal of a portion of brick cladding to repair or replace the meter boxes does not fall within the definition of items that comprise a 'significant removal or alteration of a building element', triggering a 50 year durability period as described in paragraph 1.2.1(a) of B2/AS1. This has been readily demonstrated by the fact that a portion of the brick cladding around the meter box was removed and replaced as described in paragraph 3.3.

## 6.3 The electrical meter box

6.3.1 Table 1 of B2/AS1 says that electrical fittings that are 'concealed and moderately difficult to access or replace' (my emphasis) have a required durability period of 50 years. Table 1 of B2/AS1 says that electrical fittings that are 'surface mounted' have a required durability period of 5 years. While the meter boxes, as 'electrical fittings', are moderately difficult to access or replace, they are not concealed and their condition will be readily observable.

6.3.2 If the durability of the meter boxes is considered in terms of its associated wiring, the Table 1 says that wiring 'concealed behind linings or in complex ducts, or surface mounted in conduit' has a required durability period of 15 years. A 50 year life is required for wiring 'buried in or under concrete slabs of behind structural linings ...'.

6.3.3 Table 22 of E2/AS1 shows the compatibility of materials subject to runoff and says that galvanised steel should not be located in situations where it is subject to water runoff from clay bricks with cement mortar. I note that in this instance the galvanised steel to the meter boxes has been coated to provide this separation (refer paragraph 3.3). I consider the BCA was correct in seeking this separation.

6.3.4 The BCA has submitted that three separate trades would be required to replace the meter box which supports its position that the meter box is 'difficult' to replace. The agent has submitted that, in their experience, a meter box is 'moderately difficult' to replace. The agent has also referred to a shower as an example of a building element



with a 5-year life that would involve a number of trades to replace. I accept with the agent's argument.

- 6.3.5 I consider that what is 'difficult' to replace must be taken in the context of other building elements having a required durability period of 50 years, which are primarily structural elements, and elements that are fully concealed.

## **6.4 Conclusion**

- 6.4.1 In conclusion, it is my view that the electrical meter boxes installed within brick veneer cladding are required to have a durability life of 15 years in order to comply with the durability requirements of the Building Code.

## **7. The decision**

- 7.1 In accordance with sections 177 (a) and 188 of the Building Act 2004, I hereby determine that the electrical meter boxes as installed in the brick veneer exterior comply with Building Code Clause B2 Durability.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 16 August 2010.

John Gardiner  
**Manager Determinations**