

## **Determination 2005/160**

### **Waterproofing of exterior walls at 7 Anderson Place, Queenstown**

#### **1 The parties and the matter to be determined**

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004 (“the Act”) made under due authorisation by me, John Gardiner, Determinations Manager, Department of Building and Housing, for and on behalf of the Chief Executive of that Department.
- 1.2 The applicant is Heritage Heights Limited (“the owner”) acting through its solicitors AWS Legal, and the other party is the Queenstown Lakes District Council (“the territorial authority”) acting through its agent Civic Corporation Limited. In accordance with section 27 of the New Zealand Bill of Rights Act 1990, Sinclair Brothers Ltd (“the builder”) was given the opportunity to participate in the determination as a person whose rights, obligations, or interests might be affected.
- 1.3 The application arises from the refusal of the territorial authority to issue a code compliance certificate because it was not satisfied as to the waterproofing of certain blockwork walls (“the walls”, comprising “the upper walls” and “the lower walls”).
- 1.4 The matter to be determined is whether the code compliance certificate should be issued, and specifically whether the walls comply with the requirements of clauses B2 “Durability” and E2 “External moisture” of the Building Code (the First Schedule to the Building Regulations 1992).
- 1.5 The territorial authority issued the building consent for the work in April 2003 under section 34 of the Building Act 1991 (“the previous Act”). Section 436 of the Act provides in effect that an application for a code compliance certificate in respect of building work carried out under that section must be considered as if the Act had not been passed.
- 1.6 In making my decision I have not considered any other aspects of the Act or of the Building Code.

## 2 The buildings and the sequence of events

- 2.1 The building consent was for the construction of 4 double-unit apartment buildings on a sloping site. A typical cross-section of an apartment showing the walls concerned is shown in Figure 1. The building consent did not include any waiver or modification of the Building Code in respect of the walls.

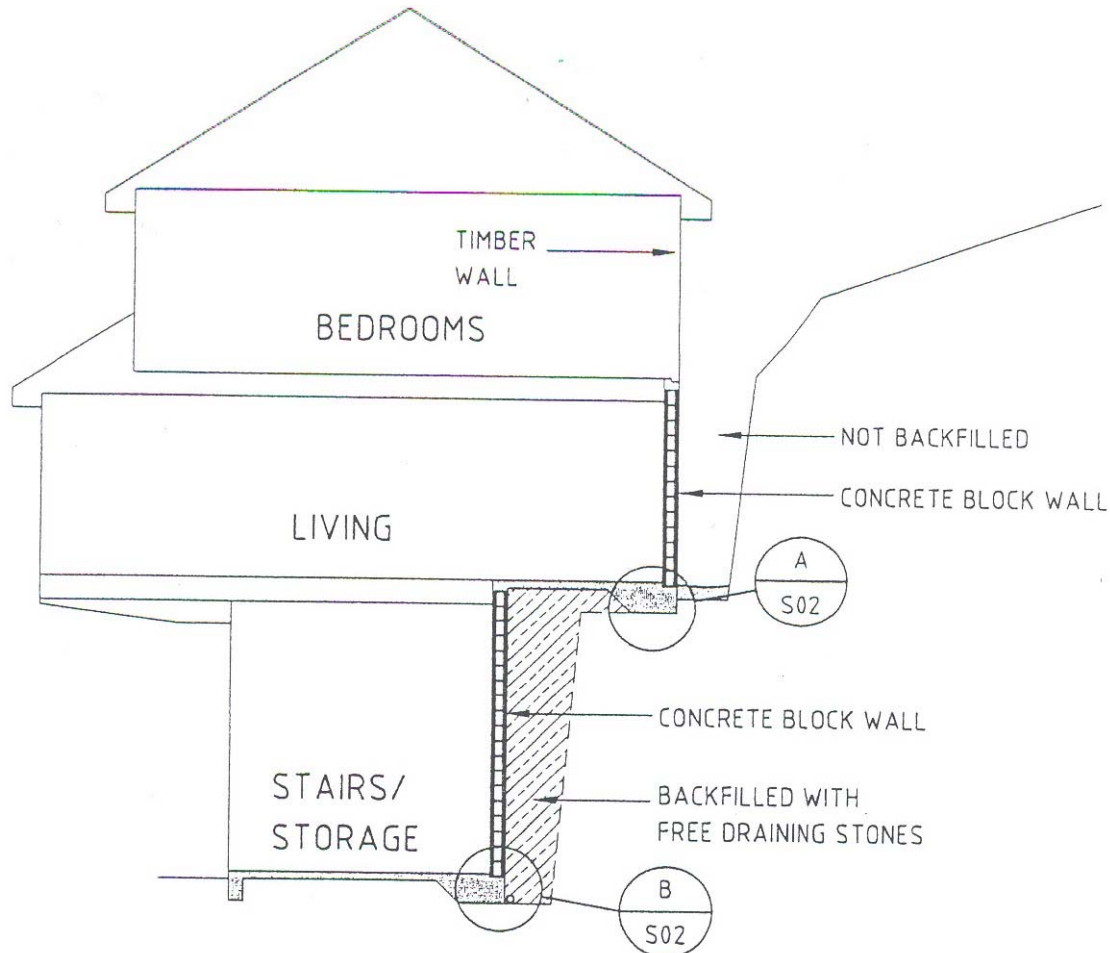


Figure 1: Typical as-built cross-section showing the walls (provided by the owner)

- 2.2 Both the upper and the lower walls were designed and constructed to retain compacted hardcore fill, with a drain at the base of the fill, but in the course of construction the owner decided to omit the fill against the upper walls.
- 2.3 The owner advised that the waterproofing on the external faces of the walls is as follows:
- Upper walls:* 2 coats of a liquid applied bitumen waterproofing with a layer of “peel and stick” self-adhesive bituminous/asphalt membrane extending from about 1m above floor level to about 200mm below floor level. That is protected by polystyrene foam sheeting, for thermal insulation, beneath fibre-cement sheeting.
  - Lower walls:* 3 coats of a liquid applied bitumen waterproofing with 0.25mm polythene taped over it. They are protected by bitumen-coated soft board.

- 2.4 The territorial authority inspected the lower walls during construction but only in respect of structural matters.
- 2.5 The building experienced significant leaking, but by then it was too late to inspect the external faces of the lower walls. On 12 July 2004 the territorial authority issued a Notice to Rectify (incorrectly dated 12 July 2006) under the previous Act in respect of various matters including the waterproofing of the walls.
- 2.6 The builder did certain remedial work, including:
- (a) Rectification of deficiencies in plumbing work such as inadequate sealing or flashing where pipes passed through blockwork and leaking pipes and fittings, and
  - (b) Applying a 2-part water-based epoxy/polyamide waterproofing coating to internal faces of the walls.
- 2.7 The territorial authority was not satisfied that the remedial work had brought the walls to compliance with the Building Code, so after further discussions and correspondence, the owner engaged consulting engineers Connell Mott MacDonald (“the consultants”) who suggested that the issue could be resolved by conducting tests on the walls to establish whether or not they were waterproof.
- 2.8 The territorial authority responded that:
- “... we cannot see that [the proposed tests] would give us the required level of satisfaction to allow the issue of a code compliance certificate for this work.”
- 2.9 Nevertheless, the consultants carried out the proposed testing, on 12 May 2005, by using a fire hose to flood water behind the upper walls to a depth of about 200mm above finished floor level while the drains were blocked. The test was over a period of approximately two hours. On the basis of that test, the consultants concluded that the walls were waterproof.
- 2.10 The territorial authority maintained its stance that it did not have reasonable grounds on which it could be satisfied that the walls complied with the Building Code, and accordingly was not prepared to issue the code compliance certificate.
- 2.11 The owner applied for this determination on 15 April 2005, stating that the matters for determination were:
- “(a) Whether the rear walls of [the building] meet the performance criteria set out in New Zealand Building Code clauses B2 - Durability and E2 - External Moisture.
  - “(b) The decision of [the territorial authority] to:
    - “(i) refuse to issue a code compliance certificate for the following building work:

- “• the durability and external moisture performance criteria under the New Zealand Building Code.”

2.12 The owner requested that I hold a hearing at which it could speak and present evidence. I sent a draft determination to the parties for the purposes of the hearing, which was held on 17 November 2005 as described in paragraph 4.2. This determination is essentially that draft amended in the light of the hearing.

### 3 The Building Code

3.1 The relevant provisions of the Building Code are:

<b>Provision</b>	<b>Limits on application</b>
<p><b>B2.3.1</b> 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:</p> <p>(a) The life of the building, being not less than 50 years, if:</p> <p style="margin-left: 40px;">(i) Those building elements (including floors, walls, and fixings) provide structural stability to the building, or</p> <p style="margin-left: 40px;">(ii) Those building elements are difficult to access or replace, or</p> <p style="margin-left: 40px;">(ii) Failure of those building elements to comply with the Building Code would go undetected during both normal use and maintenance of the building.</p> <p>(b) 15 years if:</p> <p style="margin-left: 40px;">(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</p> <p style="margin-left: 40px;">(ii) Failure of those building</p>	<p>Performance of B2.3.1 applies from the time of issue of the applicable code compliance certificate.</p> <p>Building elements are not required to satisfy a durability performance, which exceeds the specified intended life of the building.</p>

Provision	Limits on application
<p>elements to comply with the Building Code would go undetected during normal use of the building, but would be easily detected during normal maintenance. . . .</p> <p><b>E2.3.2</b> Roofs and exterior walls shall prevent the penetration of water that could cause undue dampness, or damage to building elements.</p> <p><b>E2.3.3</b> Walls, floors and structural elements in contact with the ground shall not absorb or transmit moisture in quantities that could cause undue dampness, or damage to building elements.</p>	

## 4 The submissions

### 4.1 The original submissions

- 4.1.1 Both the owner and the territorial authority submitted extensive documentation, including correspondence between the parties, reports from the consultants, and numerous photographs.
- 4.1.2 The territorial authority submitted that there were numerous deficiencies including:
- (a) “Concrete blocks poorly struck off at the joints”.
  - (b) The liquid applied bitumen waterproofing was not consistently applied as specified but “1 coat at many points, and missing altogether at some points”.
  - (c) The “peel and stick” membrane “only applied to some parts of the wall . . . as [the builders] were not prepared to excavate out to get to all areas”.
  - (d) The waterproof coating on internal faces “has been missed altogether on a number of walls, not applied behind studs fastened to [the walls] nor where it is lined”.
- 4.1.3 As regards the test, the territorial authority maintained its stance that such test “only give the snapshot result . . . under the artificial conditions created” and did not “give [the territorial authority] the required level of satisfaction to allow the issue of a code compliance certificate for this work”.
- 4.1.4 The owner contended that:

- (a) The leakage experienced during construction had been caused by plumbing failures, including inadequate sealing where pipes passed through blockwork.
- (b) That those plumbing failures had been rectified.
- (c) That deficiencies in waterproofing brought to its attention by the territorial authority had been rectified.
- (d) That the testing conducted by the consultants demonstrated that the walls were in fact waterproof.

4.1.5 In response to queries from me:

- (a) The territorial authority said:

“The nature of the ground which these buildings are cut into is the side of a mountain which has both surface water, but in addition substantial ground water arriving at the face of the building. During prolonged wet periods, it is reasonable to expect that the entire face of the covered walls will be exposed to continual wetting, and we would not accept that the testing . . . would at all replicate the environment which could reasonably be expected.”

- (b) The consultants said that they had had no involvement in the design or construction prior to the test, and that they regarded the waterproofing on external faces of the walls as being “enhanced” by the waterproofing on the internal faces.

## **4.2 The hearing**

4.2.1 The hearing was held before me on 17 November 2005, and included a visit to the site. The owner was represented by its solicitor, Mr A Hitchcock of AWS Legal, who called evidence from directors of the owner and from the owner’s engineering consultant, Dr G Wilby of Connell Mott MacDonald. The territorial authority was represented by its operations manager, Mr G Stuart, who spoke to written submissions from Mr P Laurensen, the manager building of Civic Corporation, and called evidence from Mr H Arnestedt, a Civic Corporation building official. The builder was represented by Mr G Sinclair, one of its directors. In attendance were Mr J Hill, a Referee acting for and on behalf of the Chief Executive by delegated authority under section 187(2) of the Building Act 2004, and officers of the Department.

4.2.2 The owner submitted various non-controversial corrections to the draft determination, which I accepted. The owner repeated its assertions that the lower walls were in fact waterproof. Leakage through the walls had been caused solely by faulty plumbing fixtures. Photographs that appeared to show leakage during and after construction were misleading. A section of the upper walls was still acting as a retaining wall, but the retained ground would be removed.

- 4.2.3 However, “in order to facilitate agreement”, the owner proposed to make a number of changes, and Dr Wilby gave evidence as to those proposed changes, which are discussed through paragraph 7.
- 4.2.4 Dr Wilby also commented on the required durability period required for basement tanking, and I have amended the draft to clarify my views on that matter (paragraph 5.2.1).
- 4.2.5 The territorial authority agreed with the draft. It did not accept the owner’s submission that the observed leaks had been caused solely by faulty plumbing. It considered that the owner’s submissions in respect of proposed changes were outside the scope of the determination process, which was limited to whether the territorial authority “could be reasonably satisfied that all of the building work complied with the Building Code at the time it was asked to do so by [the owner]”.
- 4.2.6 The owner responded that under section 177(a) of the Act the chief executive had the jurisdiction to determine “whether particular matters comply with the Building Code”, and the proposed changes came within that provision.

## **5 Discussion**

### **5.1 General**

- 5.1.1 I consider that the owner has not established that the leaking experienced during construction was due solely to plumbing errors. I am not persuaded that photographs taken in August 2004, which appear to show water coming through joints in the blockwork and at the bases of the walls, are misleading. Those locations are away from plumbing fittings so that it is difficult to ascribe that water to plumbing leaks.
- 5.1.2 For the purposes of determining whether a code compliance certificate should be issued, I take no account of the waterproof coating on the internal faces of the lower walls because it has not been applied in various locations where joinery and the like is hard up against the blockwork (whether or not separated from it by damp-proof material) nor where the walls have been lined.
- 5.1.3 I therefore conclude that the matter turns on whether there are reasonable grounds on which I can be satisfied that the waterproofing on the external faces of the lower walls does in fact comply with clauses B2 and E2 of the Building Code, taking into account:
- (a) The durability periods required by clause B2,
  - (c) The current state and extent of the waterproofing, and
  - (d) The test described in paragraph 2.9.

## 5.2 Durability

5.2.1 Clause B2 of the Building Code specifies durability periods for which a building element “must, with only normal maintenance, continue to satisfy the performance requirements of this code”. I take the view that, in respect of a retaining wall, the durability period for compliance with clause E2 External moisture relates to the building element that provides waterproofing, whereas the durability period for compliance with clause B1 Structure relates to the building element, usually the wall as a whole, that provides structural stability. Accordingly, in this case I consider that:

- (a) Waterproofing on the internal faces of the lower walls comes within clause B2.3.1(b) (15 year durability period) because it is “moderately difficult to access or replace”, but
- (b) Waterproofing to the external faces (the faces now covered with fill) of the lower walls comes within clause B2.3.1(a) (indefinite but not less than 50 year durability period) because it is “difficult to access or replace”.

## 5.3 The current state of the waterproofing

5.3.1 The photographs show significant deficiencies in the waterproofing to the external faces of the upper walls. I have no evidence as to the state of the waterproofing to the external faces of the lower walls but given my conclusion that the leaking was not due solely to plumbing errors, I consider that it would be unrealistic to conclude that the waterproofing to the lower walls was properly applied and is in good condition.

5.3.2 The owner claims that it has done rectification work that has removed the upper wall deficiencies. However, from the photographs I am not satisfied that such work extended to ensuring that the “peel and stick” membrane does in fact extend along the entire length of each face or for the specified distance below floor level.

5.3.3 No rectification work (other than the 2-part waterproofing coating to internal faces) had been done in respect of any lower wall deficiencies.

5.3.4 I therefore conclude that I do not have reasonable grounds on which I can be satisfied that the waterproofing on the external faces of the lower walls is properly applied.

## 5.4 The test

5.4.1 The consultants’ report on the test concluded that the walls “are waterproof”. The consultants said:

“A test is the only way to demonstrate whether anything is waterproof, be it a roof or a window or a swimming pool. If the waterproofing systems are shown to work satisfactorily (by test) at the present time, then they should continue to do so for the life of the products that comprise the waterproofing systems.”

5.4.2 I do not accept the test as evidence of anything more than that no leakage through the walls was visible during the test period.



- 5.4.3 Accordingly, I do not consider that the test constitutes reasonable grounds on which I can be satisfied that the walls, with only normal maintenance, will protect the buildings from dampness due to external moisture for 15 years in the case of the upper walls and throughout the life of the buildings in the case of the lower walls.

## **6 Conclusions**

- 6.1 For the reasons set out above, I conclude that the evidence before me does not amount to reasonable grounds on which I can be satisfied that the walls comply with clauses B2 and E2 of the Building Code.

## **7 What is to be done**

### **7.1 General**

- 7.1.1 As mentioned in paragraph 4.2.3, the owner proposes to make a number of changes. Those changes will require an amendment to the current building consent. The owner's submissions and Dr Wilby's discussion of those proposed changes were not sufficiently specific for an application for building consent (or for me to determine compliance with the Building Code). Accordingly, I cannot make any decision in respect of the changes.
- 7.1.2 Nevertheless, I discuss the proposed changes below and outline my views on them so as to assist the parties with their future actions.

### **7.2 The proposed changes**

- 7.2.1 In essence, the proposed changes consist of:
- “• Lowering of ground level behind the units so that the upper walls are no longer required to act as tanked walls
  - “• Sealing of the ground behind the units to greatly reduce the quantities of water seeping down to the lower wall area
  - “• Provision of an overflow from each sump located behind the units
  - “• Application (by an independent approved applicator) of waterproofing to the inside face of the lower walls with a 15 year warranty”
- 7.2.2 The timber walls and joinery (which I understand includes certain stairs) that butt into the lower walls will be temporarily removed so that the full wall can be waterproofed.
- 7.2.3 I consider that after wooden members have been temporarily removed from contact with the walls, any mechanical fastenings will have to be removed from the walls

and any holes made good before the waterproofing coating is applied. When such members are replaced, they will have to be fixed by means that do not affect the coating.

- 7.2.4 If inter-tenancy walls are affected, it will be necessary to consider other provisions of the Building Code, particularly as regards fire resistance and sound transmission.
- 7.2.5 An amendment to the current building consent will be needed for the building work involved in the proposed changes. Provisions will need to be made for the territorial authority, or an independent inspector approved by the territorial authority, to inspect the changes at appropriate stages of construction.
- 7.2.6 Any doubt or dispute about such changes may be referred to me for a further determination.

### **7.3 Conclusions**

- 7.3.1 I conclude that if the proposed changes described in paragraph 7.2 are properly detailed in plans and specifications suitable for building consent purposes and are fully justified in terms of compliance with the Building Code, then the territorial authority will be able to amend the building consent. If the changes are properly made in accordance with the amended consent, then the walls will comply with the Building Code.

## **8 Decision**

- 8.1 In accordance with section 188 of the Act, I hereby confirm the territorial authority's decision to refuse to issue the code compliance certificate.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 6 December 2005.

John Gardiner  
**Determinations Manager**