



## Determination 2018/007

# Regarding the compliance of door thresholds to a proposed gymnasium in a school at 255 Johns Road, Rangiora

### Summary

This determination considers the compliance of door thresholds to a proposed gymnasium in a school where the threshold incorporates a change in level of 20mm between the external and internal surfaces. The determination assesses the detail against the Acceptable Solutions D1/AS1, C/AS4 and E2/AS1 and discusses the terms “stepped threshold”, “weather stop” and “isolated step”.

### 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, Katie Gordon, Manager Determinations, Ministry of Business, Innovation and Employment (“the Ministry”), for and on behalf of the Chief Executive of the Ministry.
- 1.2 The parties to the determination are:
  - Waimakariri District Council (“the authority”), carrying out its duties as a territorial authority or building consent authority and who is the applicant in this determination
  - the owner of the school, Canterbury Education Trust (“the owner”) acting through an agent (“the owner’s agent”).
- 1.3 A copy of the draft determination was forwarded to the Office for Disability Issues (“ODI”) at the Ministry of Social Development, by way of consultation under section 170 of the Act.
- 1.4 This determination arises from the authority’s view that a change in level at the door thresholds of the gymnasium does not comply with Clauses<sup>2</sup> D1 Access routes and C4 Movement to a place of safety of the Building Code (First Schedule, Building Regulations 1992). The authority has received an application for a building consent to construct the school, and although it has not formally refused to grant the building consent the authority considers that compliance with the relevant clauses has not been demonstrated in the application for building consent.
- 1.5 The matter to be determined<sup>3</sup> is therefore whether the access to the gymnasium complies with the Building Code to the extent required by the Act.

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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.building.govt.nz](http://www.building.govt.nz) or by contacting the Ministry on 0800 242 243.

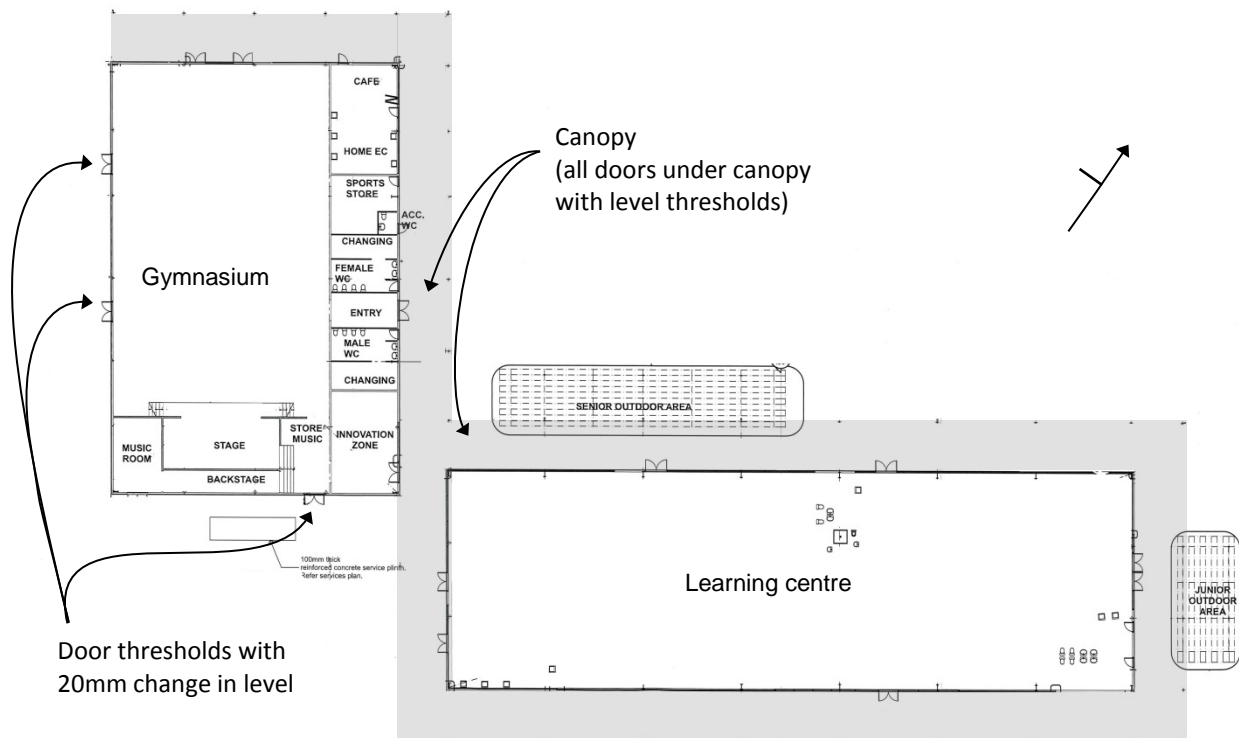
<sup>2</sup> In this determination, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

<sup>3</sup> Under sections 177(1)(a) of the Act

- 1.6 The relevant sections of the Act, clauses of the Building Code, and paragraphs of the Acceptable Solutions discussed in this determination are appended.

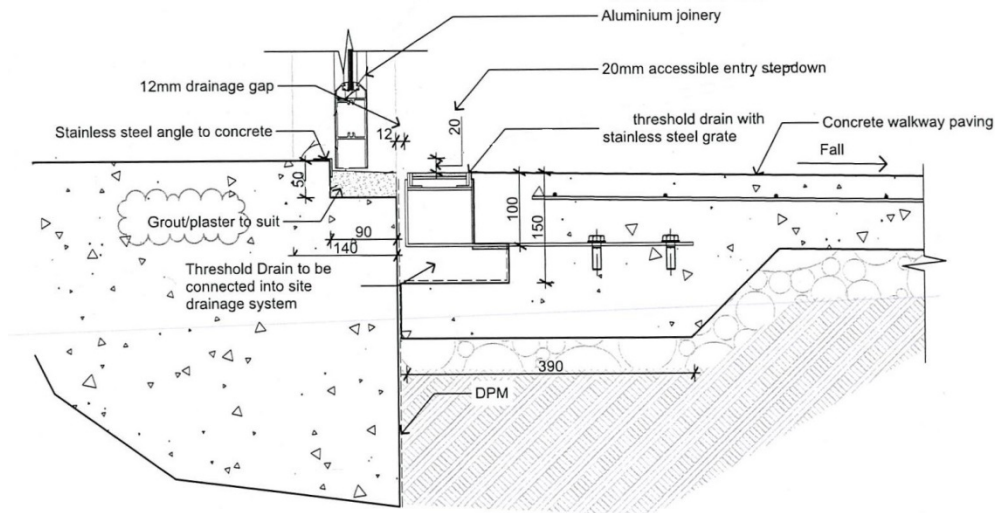
## 2. The building work

- 2.1 The proposed building work consists of the construction of a learning centre and a gymnasium. The gymnasium is used for sports activities and assemblies, and also contains a café, food technology classroom, changing rooms, and music room. The main entrance to the gymnasium is to the northeast of the learning centre.
- 2.2 The designer has proposed two different door thresholds for use in different areas. The doors of both the learning centre and gymnasium that are under canopies (shown shaded in Figure 1 below) will have level thresholds. Three doors to the gymnasium, to the southwest and southeast, will have a door threshold that incorporates a change in level of 20mm between the external and internal surfaces (see Figures 1 and 2). It is the compliance of these three door thresholds that is in dispute.



**Figure 1: site plan (not to scale)**

- 2.3 For all three doors, the proposed design consists of an aluminium swing door above a rebate at the edge of the concrete slab. There is an external threshold drain with a stainless steel grate set level with the external concrete surface (see Figure 2). The detail of the design that is in dispute is the 20mm change in level from the external surface to the internal surface.



**Figure 2: Door threshold detail (not to scale)**

### 3. Background

- 3.1 The authority received the building consent application<sup>4</sup> at some time in 2017. The authority raised concerns with the designer regarding the door thresholds to the gymnasium in relation to the height of the door sills.
- 3.2 The authority requested further information on 19 September 2017<sup>5</sup>. The designer responded on 26 September, noting that door thresholds had been detailed to satisfy Clause E2 – External moisture, and this was driven by the use of outward opening doors in locations with no weather protection. The designer also noted that the detail had originally proposed aluminium sills but that this was reviewed in light of the level of use and the designer’s experience of poor performance of aluminium sills in similar projects.
- 3.3 The designer considered there was a conflict between the requirement for weathertightness and the performance requirements for accessible routes and fire egress, but noted that the Acceptable Solutions allowed for ‘threshold weather stops projecting no more than 20mm’. The designer confirmed the proposal was to use level thresholds for external doors where there are walkway canopies, but where external walls in the gymnasium have no weather protection canopies there would be a 20mm change in level. The designer considered these doors were ‘not essentially an accessible route’ but acknowledged they function as fire egress.
- 3.4 On 27 September 2017 the authority advised the designer that it had previously taken advice on accessibility, and the authority does not approve steps or changes in floor level either side of the threshold. In regards to the use of aluminium sills, the authority noted that the joinery would have a five year durability requirement<sup>6</sup> and maintenance is the responsibility of the building owner; in the authority’s view the need for maintenance should not override the requirement to comply.

<sup>4</sup> BC170690

<sup>5</sup> I have not seen a copy of the requests for information 10 and 11

<sup>6</sup> Under Clause B2.3.1(c)

- 3.5 On 3 October 2017 the authority advised the designer that it did not accept the proposed detail (as shown in figure 2); the authority was of the view it does not comply with the Acceptable Solutions or with the Building Code. The authority described an example of a detail that it considered compliant.
- 3.6 The designer then contacted the Ministry for advice on the issue. An officer of the Ministry discussed the situation with the parties and followed up with an email on 3 October which stated:
- [Regarding the authority's] apparent non-acceptance of thresholds complying with acceptable solution D1/AS1 Paragraph 1.3.
- While I understand [the authority] may have a preference for other details, that does not enable it to refuse a design that complies with the Ministry's 'deemed to comply' acceptable solution (see Building Act section 19(1)(b)).
- 3.7 The authority responded that it was seeking for the designer to comply with 'the narrative of paragraph 1.3.2 of D1/AS1', and noted that the proposed details 'have a 20mm change in level at the threshold and not a projection above the threshold surface'. The authority noted that the Acceptable Solutions for the C Clauses are consistent with the requirement for the same level on both sides, and referred to Clause 3.15.5(d) and the comment that a 20mm "weather stop" is acceptable. The authority considered the Acceptable Solution allows for a "weather stop" as opposed to a "weather step".
- 3.8 In a further email to the authority, the officer of the Ministry stated:
- ... the intention of D1/AS1 is to allow a 20mm step for the purposes of weathering. We don't believe the distinction [the authority] has drawn between step and stop is of any material consequence. ... NZS4121<sup>7</sup> clause 7.1.4.1 allows a 'stepped threshold' provided 'the change in level is 20mm or less' and .... NZS 4121 is also an acceptable solution in its own right and therefore a 'deemed to comply' solution by virtue of Building Act section 119.
- 3.9 The authority responded to the Ministry on 4 October, maintaining the view it expressed previously, further noting that the Acceptable Solution D1/AS1 at paragraph 1.3.1 states that 'a single isolated step shall not be permitted' and referring also to paragraph 1.3.2 concerning threshold weather stops.
- 3.10 The designer maintained the view that the detail was compliant with the Acceptable Solution and must be accepted by the authority as achieving compliance with the Building Code. The designer referred the matter to the owner's agent.
- 3.11 The Ministry received an application for a determination from the authority on 17 October 2017. On 20 October the Ministry sought confirmation from the parties that it was the detail shown in Figure 2 above that was in dispute.
- 3.12 The owner's agent responded on 24 October 2017, confirming the proposed detail that was in dispute and providing comment from the designer (see paragraph 4.4).

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<sup>7</sup> New Zealand Standard NZS 4121:2001 *Design for access and mobility: Buildings and associated facilities*

## 4. The submissions

4.1 With the application for determination, the authority provided copies of:

- plans and details from the building consent application
- relevant email correspondence between the parties and with the Ministry
- email correspondence with representatives of Barrier Free New Zealand Trust and the Waimakariri Access Group
- correspondence between the authority, the designer of another school project, and an officer of the Ministry concerning changes of level at door thresholds
- figures of various design solutions.

4.2 In a submission supporting the application for determination, the authority set out some of the background to the dispute and its views on compliance.

- While weathertightness is important it should not diminish compliance with other clauses of the Building Code.
- No quantitative fact or in-service history has been presented that shows level access routes that are ‘appropriate in design’ create moisture ingress problems.
- The authority is aware of details used in other building projects that would achieve compliance, and it should be reasonable and practicable to design buildings that comply with all of the code requirements. Clauses D1 and C1-6 are often “afterthoughts” in the design process.
- The proposed detail does not comply with the wording of D1/AS1 paragraphs 1.3.2, 1.3.3 or C/AS4 paragraph 3.15. NZS 4121/ D1/AS1 and C/AS4 act together to require level access routes.
- C1/AS1 only cites NZS 4121 in reference to car parking areas and lifts; ‘at times, NZS 4121 may be an acceptable method of compliance with some aspects of Clause D1’.
- NZS 4121 has numerous references to providing level access routes. The mandatory term “shall” is used in paragraph 7.1.4 of the Standard in regards to the provision of level thresholds. Though the Standard sets out the requirements for stepped thresholds, this is not a means to provide designers with an option for something other than level thresholds, but rather applies only when a step is “required”. In this case the building can be designed so that a step is not required.

4.3 In its submission the authority also:

- set out its definition for the terms “door sill” and “door threshold”
- discussed its view that a waiver<sup>8</sup> would not be appropriate, with reference to the Consultation Report: Access to Buildings for People with Disabilities June 2014<sup>9</sup>

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<sup>8</sup> The authority cannot grant an application for a building consent subject to a waiver or modification of the Building Code relating to access and facilities for people with disabilities (section 67(3)).

<sup>9</sup> Consultation Report: Access to Buildings for People with Disabilities (June 2014) Appendix 2: examples of accessible buildings (comments by people with various types of impairments) available on the Ministry’s website [www.mbie.govt.nz](http://www.mbie.govt.nz)

- provided a substantive submission regarding the design approach to access routes generally and referring to shortcomings in building design for accessibility as described in the “Accessibility Plan – Public Buildings”<sup>10</sup>.

4.4 The owner’s agent acknowledged the application on 20 October 2017. On 24 October the agent provided comments from the designer and a plan marked to show the doors where the disputed thresholds are proposed. The designer confirmed that level threshold details are proposed where doors are protected by canopies, but the designer considered that using level details for doors that are exposed would mean that there would be non-compliance with Clause E2:

...the sill design must meet the full requirements of “E2 / External Moisture”, which means there must be a weather rebate for the door to close against and a clear path provided for any moisture to be turned out.

4.5 The designer also expressed concern that if the authority’s interpretation was correct then there was in effect no Acceptable Solution available.

## 5. The draft determination

5.1 A draft determination was issued to the parties and ODI for comment on 24 November 2017.

### 5.2 The parties’ submissions on the draft

5.2.1 ODI made a submission on the draft determination dated 7 December 2017. ODI accepted the decision in the draft determination and noted that it followed existing legislation. The office also expressed its views on what constituted quality design for door thresholds ‘to ensure equity of access to all areas by disabled people’.

5.2.2 The authority did not accept the draft determination and made a submission on it dated 7 December 2017. The submission focussed on the disputed threshold design’s compliance with Clauses C4, D1 and E2, with particular reference to the Acceptable Solutions. It also queried some of the wording used in the draft determination, and I have altered this where appropriate.

5.2.3 The balance of the authority’s submission was concerned with:

- the respective meaning of the terms “threshold”, “stepped threshold”, “isolated step” and “threshold weather stop” in the respective Building Code clauses and their Acceptable Solutions, and how they should be interpreted in the current case
- how compliance with Clause D1 could not be considered achieved when the disputed design incorporates an isolated step
- how compliance with Clause C4 could not be considered achieved when the disputed design incorporates a change in level
- perceived inadequacies in the proposed design in terms of achieving compliance with Clause E2, and suggestions for how alternative designs could achieve the same standard of performance.

5.2.4 The owner accepted the draft determination without comment on 15 February 2018.

<sup>10</sup> The Accessibility Plan – Public Buildings forms a part of the Disability Access Review which is a joint undertaking between the Ministry and the Office for Disability Issues, and is available on the Ministry’s website [www.mbie.govt.nz](http://www.mbie.govt.nz)

## **6. Discussion**

### **6.1 The legislation**

- 6.1.1 Section 17 of the Act provides all building work must comply with the Building Code to the extent required by the Act. The gymnasium is a ‘premise or facilities to which the public are to be admitted ...’ and it must comply with the provisions under section 118 of the Act regarding access and facilities for people with disabilities.
- 6.1.2 The authority is of the view that the threshold detail does not comply with Clauses D1 and C4 of the Building Code. The designer maintains the view that a level threshold would not comply with Clause E2. The relevant performance clauses are copied in Appendix A.2.
- 6.1.3 Section 19 of the Act provides various means by which compliance with the Building Code can be established:
- (1) A building consent authority must accept any or all of the following as establishing compliance with the building code: ...
  - (b) compliance with an acceptable solution: ...
- 6.1.4 Section 22(2) of the Act provides:
- (2) A person who complies with an acceptable solution or a verification method must, for the purposes of this Act, be treated as having complied with the provisions of the building code to which that acceptable solution or verification method relates.
- 6.1.5 In addition, section 119 of the Act provides New Zealand Standard No 4121 is to be taken as an Acceptable Solution for the purpose of Building Code requirements relating to persons with disabilities.

### **6.2 Establishing the compliance of the proposed detail**

- 6.2.1 Much of the original discussion between the parties, and of their subsequent submissions for this determination, has focussed on potential alternative designs for the disputed thresholds. To this end, the authority has consulted New Zealand Barrier Free Trust and Waimakariri Access Group with regards to changes of level at door thresholds.
- 6.2.2 I acknowledge the opinions of the two groups consulted and that the authority has a desire to see best practice implemented. However, it is important to note as a preliminary point that building work is not required to achieve performance criteria that are additional to the performance criteria prescribed in the Building Code (refer section 18(1) of the Act).
- 6.2.3 Accordingly, the test for compliance that the authority should have applied in assessing the owner’s application for a building consent was not whether the proposed threshold detail complied with the authority’s concepts of best practice for accessible entranceways, but rather whether it achieved the performance requirements of the relevant clauses of the Building Code.
- 6.2.4 This is the question which I must now consider in this determination. The relevant Building Code clauses that apply are clauses D1 Access routes, C4 Movement to a place of safety, and E2 External moisture.
- 6.2.5 In making my decision on compliance, I have considered whether the detail is in accordance with the Acceptable Solutions D1/AS1, C/AS4 and E2/AS1. If the detail complies with an Acceptable Solution, then it must be accepted by the authority as

meeting the performance requirements of the Building Code. In the following paragraphs I consider each of the Acceptable Solutions in turn.

### 6.3 D1/AS1

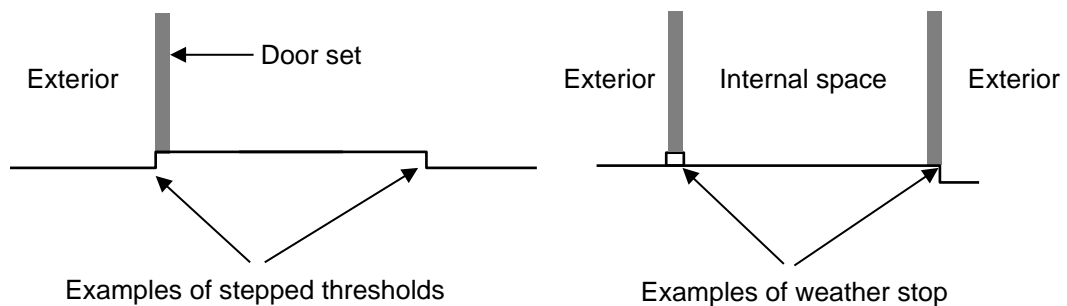
- 6.3.1 Clause D1 sets out performance criteria for access routes. Clause D1.3.2 specifies that at least one access route into a building must be accessible, allowing people with disabilities to approach, enter and use buildings. Clause D1.3.4 sets out additional performance criteria that apply to such accessible routes.
- 6.3.2 In the current case I note that the proposed gymnasium has three accessible routes, namely the three external doors that will be covered by the canopy and have level thresholds. Accordingly, there is no requirement under the Building Code for the entrances with the disputed threshold detail to serve as accessible entrances, or comply with the additional criteria in Clause D1.3.4. This has been confirmed by the designer in correspondence to the authority where he has stated that the three doors that are subject of this determination are ‘not essentially an accessible route’, but do function as egress routes in the event of a fire or other evacuation event.
- 6.3.3 In previous communications with the parties, the question of the application of NZS 4121 has been discussed. As stated in paragraph 6.1.5, this standard is an Acceptable Solution for those Building Code provisions that relate to persons with disabilities. As I have found that there is no need for the entranceways with the disputed threshold detail to act as accessible routes, then NZS 4121 does not apply to them. If the compliance of the details is to be established using an Acceptable Solution (and I note that this not the only way of establishing compliance), then D1/AS1 is the Acceptable Solution that applies.
- 6.3.4 The relevant provision in D1/AS1 for the purposes of this determination is paragraph 1.3, which addresses changes in level. Paragraph 1.3.1 states:
- 1.3.1 Except in *household units* or where permitted by Paragraph 1.3.2, a single isolated step<sup>11</sup> shall not be permitted but the change of level shall be constructed as a ramp complying with Paragraph 3.0 [Ramps].
- 6.3.5 Paragraph 1.3.2 of the Acceptable Solution provides for the use of ‘threshold weather stops projecting no more than 20 mm above the threshold finished surface’ with the following comment:
- Threshold weather stops greater than 20 mm should be designed as ramps complying with Paragraph 3.0. Height changes at doorways are particularly inconvenient for wheelchair users as it requires complex manoeuvring to get over the change in level while opening the door.
- 6.3.6 Paragraph 1.3.2 of the Acceptable Solution creates a clear exception to the prohibition on isolated steps in paragraph 1.3.1, by allowing threshold weather stops on external doors, provided they are 20mm or less in height.
- 6.3.7 In its submissions, the authority has expressed the view that the disputed detail does not constitute a weather stop. In the authority’s opinion, a weather stop ‘must form part of the doorsill, not the external surface’. The authority also states that a threshold on the other hand is as defined in D1/AS1, and is a ‘sill to an external door, or the floor under an internal door’. The authority’s argument is that the 20mm change in level does not constitute a weather stop for the purposes of paragraph 1.3.2, but is an isolated step, which is prohibited in Clause D1.3.1(i) of the Building

<sup>11</sup> The term “isolated step” is only otherwise referred to in the comment to 6.0.1 of D1/AS1: “A single riser is an isolated step which by NZBC D1.3.3 i) is permitted only within Detached dwellings ... (my emphasis)



Code. In its submissions the authority has also contrasted the term “weather stop” with that of “stepped thresholds”, as used in NZS 4121. NZS 4121 allows stepped thresholds of 20mm and under on accessible entrances, where one is necessary or required.

- 6.3.8 In general terms, and as described in the sketch in Figure 3 below, I consider that a “stepped threshold” constitutes a change in level where one side of a threshold is higher than the other – it does not necessarily need to be an external threshold nor incorporate a doorset, it may simply be a transition from one space to another where there is a change of level. I consider a “weather stop” to be a building element that is raised in height above the level of the exterior surface for the purpose of keeping external moisture from entering the building. Weather stops are often incorporated into the design of doorsets and therefore project above adjacent surfaces.



**Figure 3:**

- 6.3.9 D1/AS1 uses two different terms “isolated step” and “weather stop”. The term “isolated step” is used in D1/AS1 to describe a change of level. The term “weather stop” is used in D1/AS1 only in relation external doors. I am of the view that while a weather stop is often incorporated into a doorset, the Acceptable Solution does not preclude the use of a “stepped threshold” from being incorporated in the design of a weather stop.
- 6.3.10 The use of either a stepped threshold or a projection that is part of the doorset presents a change in height at the door threshold that is designed to protect the building from external moisture ingress. Both means of providing that protection have an impact on accessibility and there are pros and cons of each in relation to access for people with different types of disabilities. This tension is specifically addressed by the acknowledgement in NZS 4121 and D1/AS1 that a 20mm change in level still provides adequate access for persons with disabilities.
- 6.3.11 D1/AS1 provides for the use of a weather stop provided that it is no more than 20mm. I conclude that the design detail shown in Figure 2 constitutes a weather stop in terms of Acceptable Solution D1/AS1 and therefore is deemed to comply with Clause D1 of the Building Code.

## 6.4 C/AS4

- 6.4.1 Part 3 of C/AS4 sets out the parameters for a compliant means of escape. Paragraph 3.15.5 requires doors on escape routes to ‘open onto a floor area: ...ii) which is at the same level on both sides of the door.’ The commentary states:

A 20 mm threshold weather-stop is acceptable on external doors (see Acceptable Solution D1/AS1).

6.4.2 As I have concluded that the design detail complies with D1/AS1, it follows that as the doors are external doors the detail also complies with C/AS4.

## **6.5 E2/AS1**

6.5.1 In its submissions, the authority has proposed alternative designs, which in its opinion would provide superior weather protection for the disputed doors and enabled them to be constructed with level entries. However, as outlined in paragraph 6.2.3, this is not the point. What the owner must demonstrate is the design's compliance with the provisions of the Building Code, and section 18(1) of the Act makes clear that there can be no requirement for a person carrying out building to achieve additional compliance to that required by the Building Code.

6.5.2 What I must consider is whether the proposed design detail will achieve compliance with Clause E2 of the Building Code, and designing the detail in accordance with the Acceptable Solution E2/AS1 is one way this can be demonstrated.

6.5.3 In the Acceptable Solution, figure 17B (a) concrete slab, and (b) timber floor both show a doorset that incorporates a 20mm projection, so while the internal and external levels are the same there is still a 20mm height present at the threshold.

6.5.4 Taking into account the discussion in paragraph 6.3 above with regard to stepped thresholds and weather stops, I conclude that the proposed detail is of an equivalent nature to the design shown in Figure 17B, and that as a result it also complies with Clause E2/AS1 with regard to the 20mm change in level.

## **7. The decision**

7.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the proposed access to the gymnasium as shown in Figure 2 of this determination complies with D1/AS1, C/AS4, and E2/AS1, and is therefore deemed to comply with the Building Code.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 19 March 2018.

Katie Gordon  
**Manager Determinations**

## Appendix A

### A.1 The relevant sections of the Act discussed in this determination:

#### **17 All building work must comply with building code**

All building work must comply with the building code to the extent required by this Act, whether or not a building consent is required in respect of that building work.

#### **18 Building work not required to achieve performance criteria additional to or more restrictive than building code**

(1) A person who carries out any building work is not required by this Act to—

(a) achieve performance criteria that are additional to, or more restrictive than, the performance criteria prescribed in the building code in relation to that building work; or

(b) take any action in respect of that building work if it complies with the building code.

(2) Subsection (1) is subject to any express provision to the contrary in any Act.

#### **19 How compliance with building code is established**

(1) A building consent authority must accept any or all of the following as establishing compliance with the building code: ...

(b) compliance with an acceptable solution: ...

#### **22 Acceptable solution or verification method for use in establishing compliance with building code**

(1) The chief executive may, by notice in the Gazette, issue an acceptable solution or a verification method for use in establishing compliance with the building code.

(2) A person who complies with an acceptable solution or a verification method must, for the purposes of this Act, be treated as having complied with the provisions of the building code to which that acceptable solution or verification method relates.

#### **119 Acceptable solution for requirements of persons with disabilities**

(1) This section applies to—

(a) the New Zealand Standard Specification No 4121 (the code of practice for design for access and use of buildings by persons with disabilities), together with any modifications to that standard specification in force immediately before the commencement of this section; ...

(2) A standard specification to which this section applies is to be taken as an acceptable solution.

### A.2 The relevant clauses of the Building Code discussed in this determination:

#### **Clause C4 – Movement to place of safety**

##### **Functional requirement**

...

C4.2 *Buildings* must be provided with means of escape to ensure that there is a low probability of occupants of those *buildings* being unreasonably delayed or impeded from moving to a *place of safety* and that those occupants will not suffer injury or illness as a result.

**Clause D1—Access routes****Objective**

D1.1 The objective of this provision is:

- (a) safeguard people from injury during movement into, within and out of *buildings*,  
...

**Functional requirement**

D1.2.1 *Buildings* shall be provided with reasonable and adequate access to enable safe and easy movement of people.

...

**Performance**

D1.3.1 *Access routes* shall enable people to: ...

- (b) enter buildings, ...

D1.3.2 At least one access route shall have features to enable people with disabilities to: ...

- (b) have access to the internal space served by the principal access, and  
(c) have access to and within those spaces where they may be expected to work or visit, ...

D1.3.3 Access routes shall: ...

- (b) be free from dangerous obstructions and from any projections likely to cause an obstruction, ...

- (i) not contain isolated steps, ...

D1.3.4 An accessible route, in addition to the requirement of Clause D1.3.3, shall: ...

- (d) contain no thresholds or upstands forming a barrier to an unaided wheelchair user, ...

A.3 The relevant paragraphs from the Acceptable Solutions discussed in this determination (my emphasis):

C/AS4

Part 3: Means of escape

3.1 General principles

3.1.4 *Escape routes* shall comply with NZBC D1. Ramps, stairs, ladders, landings, *handrails*, doors, vision panels and openings shall comply with Acceptable Solution D1/AS1.

3.15 Doors subdividing escape routes

Degree and width of opening

3.15.5 Doors on *escape routes* (see Figure 3.22) shall satisfy the following requirements: ...

- d) Open onto a floor area which: ...

- ii) is at the same level on both sides of the door for the full width of the escape route,  
...

*Comment:*

***A 20 mm threshold weather-stop is acceptable on external doors (see Acceptable Solution D1/AS1).***

D1/AS1

## Definitions

Threshold: A sill to an external door, or the floor under an internal door.

## 1.3 Changes in level

1.3.1 Except in *household units* or where permitted by Paragraph 1.3.2, a single isolated step<sup>12</sup> shall not be permitted but the change of level shall be constructed as a ramp complying with Paragraph 3.0.

**1.3.2 Threshold weather stops projecting no more than 20 mm above the threshold finished surface are acceptable.**

*Comment*

*Threshold weather stops greater than 20 mm should be designed as ramps complying with Paragraph 3.0. Height changes at doorways are particularly inconvenient for wheelchair users as it requires complex manoeuvring to get over the change in level while opening the door.*

E2/AS1

## 7.3 Level thresholds

Where provision for level access is required, this shall be provided as shown in Figure 17A and Figure 17B.

## 7.3.2 Ground floor level access

Where provision for level access is required, this may be provided as shown in Figure 17B, with exterior paving or decking that complies with the access route requirements of D1/AS1.

*Comment:*

*The specific features of a building and its site can have a significant effect on the options available for providing level access at doors. These features include the provision of shelter, prevailing winds and ground levels. Where level access is required, it is highly recommended that the services of a designer experienced in this field be obtained.*

## 7.3.2.1 Concrete slab

Where provision for level access is required from a concrete floor slab to exterior paving,

this shall be as shown in Figure 17B with:

- a) A channel, together with drainage provisions, across the door opening, with:
  - i) the width to suit capacity in accordance with E1/AS1,
  - ii) a minimum depth of 150 mm,
  - iii) a maximum length of 3700 mm, and
  - iv) 1:200 minimum fall along length of channel towards a drainage outlet,
- b) Grating, in accordance with Tables 21 and 22, over the channel, that:
  - i) is supported independently of the door frame,
  - ii) is removable to allow access for cleaning,
  - iii) is specifically designed to accommodate imposed loads,
  - iv) has gaps sized to prevent the wheels of wheel chairs or mobility aids entering or being trapped, and

<sup>12</sup> The term “isolated step” is also used in the comment to 6.0.1: “A single riser is an isolated step which by NZBC D1.3.3 i) is permitted only within Detached dwellings ...”

- v) has a continuous gap of 12 mm minimum from door frame and wall cladding,  
and

*Comment:*

*The grating support must be specifically detailed to suit the condition of the building and site.*

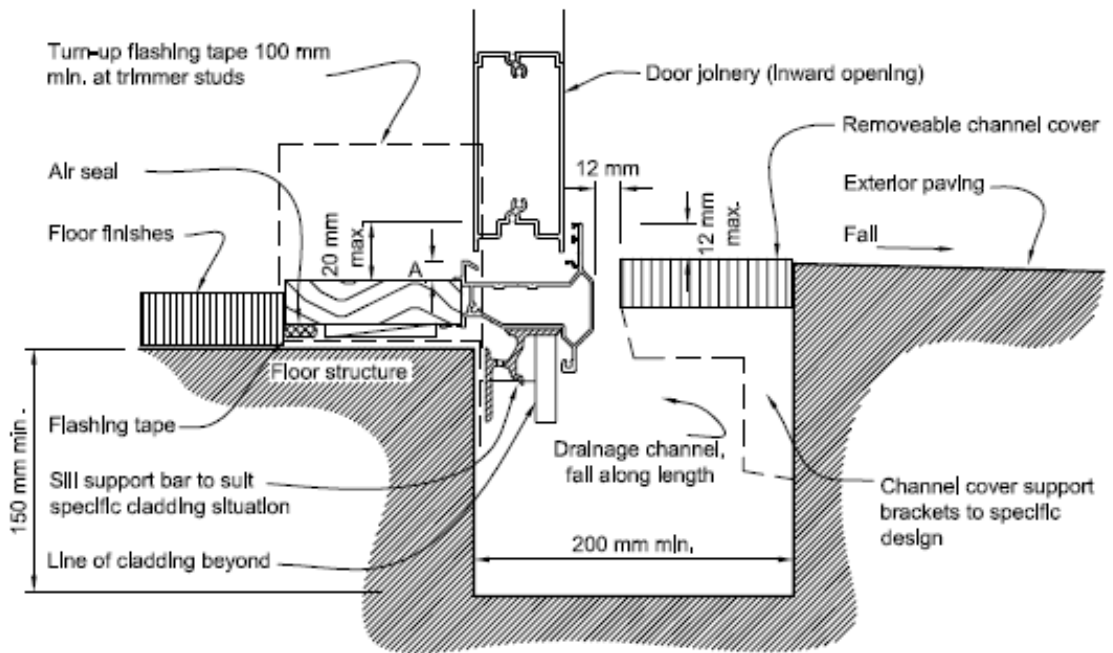
c) Exterior paving that:

- i) has a minimum fall of 1:40 away from the channel for a minimum distance of 1 m,
- ii) together with the surrounding paving and ground levels, complies with drainage requirements of E1/AS1.

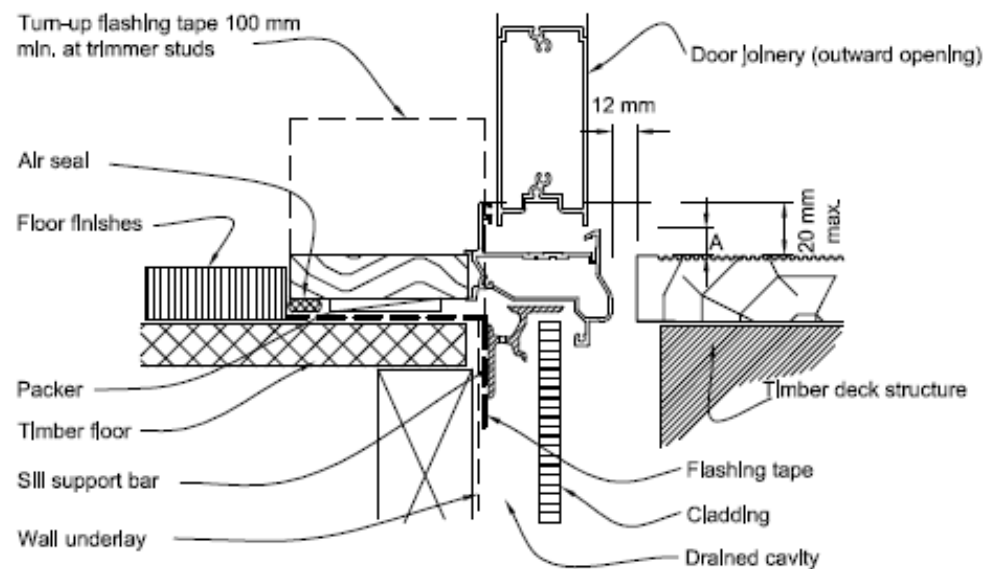
**Figure 17B: Level thresholds for ground level**  
Paragraph 7.3 and Figure 17A

**NOTE:**

- (1) Detail (a) is suitable for use with concrete floor slabs - refer Paragraph 7.3.2.1 for requirements.
- (2) Detail (b) is suitable for use with timber floors. It may also be adapted for timber decks on upper storeys as per Paragraph 7.1.1 b), or for enclosed decks, with removable panels or decking as shown in Figure 17A.
- (3) Both details may be adapted for inward or outward opening doors.
- (4) Exposure to wind-driven rain must be specifically taken into account when using these details, and shelter to doors and joinery provided where local conditions warrant.



**(a) CONCRETE SLAB**



**(b) TIMBER FLOOR**

NOTE: 'A' to be the minimum dimension to maintain clearance from the bottom of the door to finished floor or deck, to manufacturer's requirements, and to keep sill upstand height to less than 20 mm

Errata 2  
Dec 2011

Amend 5  
Aug 2011