



Determination 2012/025

Compliance of barriers to a bridge located on a former film set at 501 Buckland Road, Matamata



1. The matter to be determined

1.1 This is a Determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the Act”) made under due authorisation by me, John Gardiner, Manager Determinations, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department.

1.2 The parties to the determination are:

- Scottdale Farms Limited, the owner of the property (“the applicant”), acting through an agent
- Matamata Piako District Council, carrying out its duties and functions as a territorial authority and a building consent authority (“the authority”).

1.3 The determination arises from the authority’s refusal to issue a code compliance certificate for the building work due to its assessment that the bridge barriers do not comply with Clause F4² of the Building Code.

1.4 I therefore take the view that the matters to be determined³ are:

¹ The Building Act 2004, Building Code, compliance documents, past determinations and guidance documents issued by the Department are all available at www.dbh.govt.nz or by contacting the Department on 0800 242 243

² Unless otherwise stated, references to sections are to sections of the Act and references to clauses are to clauses of the Building Code.

- whether the barriers to the bridge comply with Clause F4 Safety from falling of the Building Code
- whether the authority was correct to refuse to issue a code compliance certificate for the building work.

1.5 In this determination I refer to the Act and the Building Code, the relevant parts of which are set out in Appendix A.

1.6 In making my decision, I have considered the submissions of the parties, the expert's report, and other evidence in this matter. I have not considered any other aspects of the Act or the Building Code.

2. The building work and background

2.1 On 1 March 2010, the applicant applied for building consent to construct a bridge over, and a watermill on the shores of, a small lake on its property (a private farm). The bridge and mill were to form part of the film set for a movie. They were intended as permanent structures, with the film set to become a tourist destination after filming had finished. A company is to operate tours of the film set and farm.

2.2 The authority issued a building consent (no. 2010.208) for the bridge and watermill on 15 April 2010. As far as I am aware, there is no dispute between the parties as to the code compliance of the watermill.

2.3 The consented plans show that the bridge was to be single span, clad in concrete pavers and panels, with solid timber-framed and concrete-clad barriers on either side. In the consented plans, the barriers are shown to be 800mm high (taken from the top of the bridge paving) and 600mm wide. The barriers are topped with 600mm wide lightweight concrete capping stones.

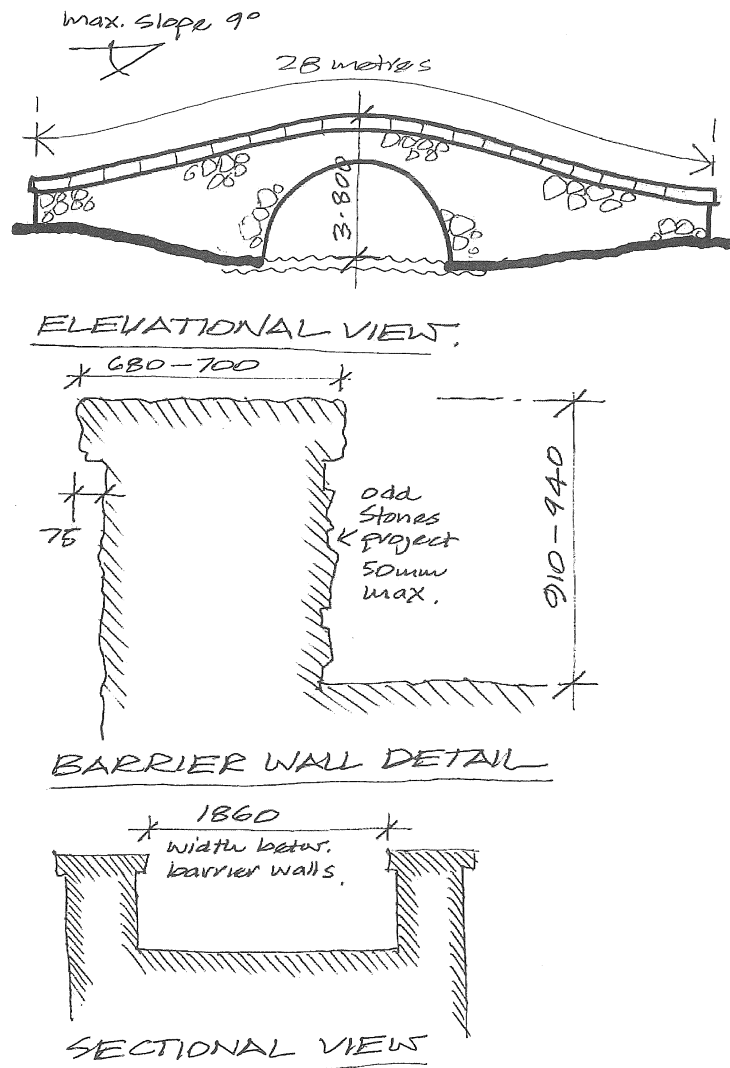
2.4 The bridge was largely constructed in accordance with the consented plans. It is 28m long and 1860mm wide between its barrier walls, sloping gradually from ground level to its midpoint at 3.8m above the lake water level. The maximum slope of the bridge is 9°.

2.5 The bridge barriers, as built, are faced and capped in stone. Due to the capping stones used being thicker than planned for, the barriers are higher than shown in the plans, ranging between 910mm and 940mm. The tops of the barriers are 680mm to 700mm wide, and have an overhang of 75mm.

2.6 The authority inspected the bridge and watermill and advised the applicant that the bridge barriers did not comply with Clause F4 of the Building Code. I have assumed that the authority has refused to issue a code compliance certificate as a result, although I have not seen any paperwork to this effect. If this is the case, then section 95A of the Act requires the authority to provide the applicant with written reasons for its refusal.

³ Under section 177(1)(a), 177(1)(b) and 177(2)(d) of the Act.

- 2.7 On 28 November 2011 the Department received an application for a determination. The Department sought further information from the applicant which was provided by the authority on 20 December 2011.
- 2.8 The following sketches show the dimensions and details of the bridge as-built.



3. Submissions

- 3.1 The applicant is seeking a determination to grant an 'exemption to the handrail height requirement of [the] bridge'.
- 3.2 In submission the applicant states a belief that an exemption is necessary because the barriers are less than the 'legal height requirement' of 1000mm. The reasons given to support the application are that:
- the bridge is of 'national significance' from its role in The Lord of the Rings and The Hobbit movies, and has since become a 'significant tourist destination'

- granting the exemption would not ‘compromise anyone’s safety...especially given the structural integrity of the bridge’ and the width of the barrier ‘which adds to the safety of the bridge as people cannot peer over or grasp the rail’.
- 3.3 The applicant provided copies of:
- the approved plans for the bridge
 - photographs of the bridge as built.
- 3.4 The authority made a submission dated 16 December 2011 in which it stated that the bridge barriers do not comply with the Building Code. The reasons given were:
- The barrier on the bridge does not meet the requirements of the acceptable solutions contained in F4/AS1. This is because:
1. it does not meet the minimum barrier height requirement of 1100mm under F4/AS1 clause 1.1.1 (table 1)
 2. it does not meet the requirements of F4/AS1 clause 1.2.3 (Figure 5) for barriers in buildings other than housing having a parapet or horizontal rail form of construction.
- [The authority is] of the opinion that there are no other aspects of the design of the bridge barrier that mitigate the lack of height or the wide top, for this reason [the authority does] not think that the current design can be considered to meet the requirements of the building code as an alternative solution.
- 3.5 The authority went on to say that it was not prepared to grant a waiver of the Building Code under section 67 of the Act on the basis of either management practices or a ‘wish to achieve an appropriate appearance’ for the bridge. The authority did not explain on what basis it had issued a building consent for the bridge.
- 3.6 The authority provided copies of:
- the building consent
 - photographs of the bridge during construction.
- 3.7 A draft determination was issued to the parties for comment on 14 March 2012.
- 3.8 The applicant accepted the draft determination in a response received on 23 March 2012, subject to non contentious amendments.
- 3.9 The authority accepted the draft determination in a response received on 28 March 2012, noting:
- the authority issued the building consent on the basis of an undertaking by the owners that they would install barriers to the bridge in accordance with Clause F4 once filming was complete
 - the intended use of the bridge as a tourist attraction was contemplated at the time the building consent was issued
 - the barrier does provide a platform that must comply with Clause F4.3.1, but the authority accepts the determination in respect of the current context described in paragraph 5.6.6.

- 3.10 In its response to the draft determination the authority also provided a copy of a letter dated 17 February 2011 from the film company confirming that barriers complying with Clause F4 would be installed on the completion of filming prior to application for a code compliance certificate. I note that there was no condition included in regards this understanding between the parties in the consent issued in 2010.

4. The expert's report

- 4.1 As mentioned in paragraph 1.6, I engaged an independent expert to assist me. The expert is a registered architect. The expert inspected the bridge to verify its dimensions and provided a report dated 8 February 2012. The report included accurate measurements and photos of the bridge. A copy of the report was provided to the parties.

5. Discussion

- 5.1 The matter to be determined is whether the bridge balustrade, as built, complies with the Clause F4 Safety from falling of the Building Code.
- 5.2 The Building Code is performance based and Clause F4.3.1 requires that a barrier shall be provided where people could fall 1 metre or more from an opening in the external envelope or floor of a building.
- 5.3 In my opinion, the aspects of the bridge barriers that need to be considered in order to assess compliance with Clause F4 are:
- the barriers' height and width
 - the barriers' ability to restrict the passage of children under 6 years of age
 - the barrier's flat top.

5.4 The barriers' height and width

- 5.4.1 The authority has identified the barriers' height as one of the reasons for its decision that the barriers do not comply with the Building Code.
- 5.4.2 There are no specific requirements for heights for barriers in the Building Code; what is important is whether the barriers in question achieve the performance criteria.
- 5.4.3 The Department's compliance document, Acceptable Solution F4/AS1, provides some design solutions for barriers that will comply. However, it is important to note that other barrier designs, which do not appear in F4/AS1, may equally achieve compliance provided that the elements that make up the barrier are configured in such a way that the performance requirements of the Building Code are met.
- 5.4.4 Subparagraph 1.1.1 and Table 1 of F4/AS1 provide minimum heights for barriers designed in accordance with the Acceptable Solution; these range between 800mm and 1100mm depending on the barrier's location. For bridge barriers, the minimum height specified by the Acceptable Solution is 1100mm.

5.4.5 It is clear that the current barriers do not meet the design specifications in F4/AS1. I must therefore assess compliance with the Building Code as an alternative solution.

5.4.6 In my view, the width of the barrier makes it extremely unlikely that anyone who tripped or lost their footing (or was even pushed) while standing on the bridge itself could fall over the barriers. At 680-700mm they are wide enough that anyone who did fall on or against them would be effectively prevented from toppling over the barrier.

5.4.7 In Determination 2002/4, the Building Industry Authority⁴ considered the adequacy of a barrier and used NBS IR76-1131, the US *Model Performance Standard for Guardrails* issued by the National Bureau for Standards (“the US Standard”) as a tool to assess a barrier as an alternative solution. While the US Standard is not New Zealand legislation, it provides a useful tool to assist in assessing compliance.

5.4.8 The US Standard has a criterion (in A3.2) for height in relation to width as follows (inches converted to millimetres):

The height requirement stipulated in Criterion A3.1 [1063mm]⁵ may be relaxed under the following conditions:

- (a) If the top surface of the guardrail is horizontal and has a width greater than [152.4mm] and the floor surface of the interior adjoining region is level, the minimum height H of the guardrail shall not be less than,

$H = K - B$, where B is the minimum width of the top surface of the guardrail and K is [1219mm]. However in no case, shall the minimum height be less than [762mm].

5.4.9 The bridge barrier is between 910-940mm in height and 680-700mm in width. Using the criterion in paragraph 5.4.8, with a barrier width of 680mm the corresponding minimum barrier height is 539mm as follows:

$$H = K - B, \text{ with } K = 1219\text{mm}, \text{ and } B = 680\text{mm (at its minimum)}$$

$$H = 1219 - 680 = 539$$

However, according to the US Standard, the minimum height regardless of barrier width, is 762mm. As the height of the bridge barrier is 910mm (at its minimum), it therefore complies with the US Standard.

5.4.10 I also note the given the US Standard minimum height of 762mm, the criterion used in paragraph 5.4.8 can also be used to determine the minimum barrier width as follows:

$$B = K - H, \text{ with } K = 1219\text{mm}, \text{ and } H = 762 \text{ mm}$$

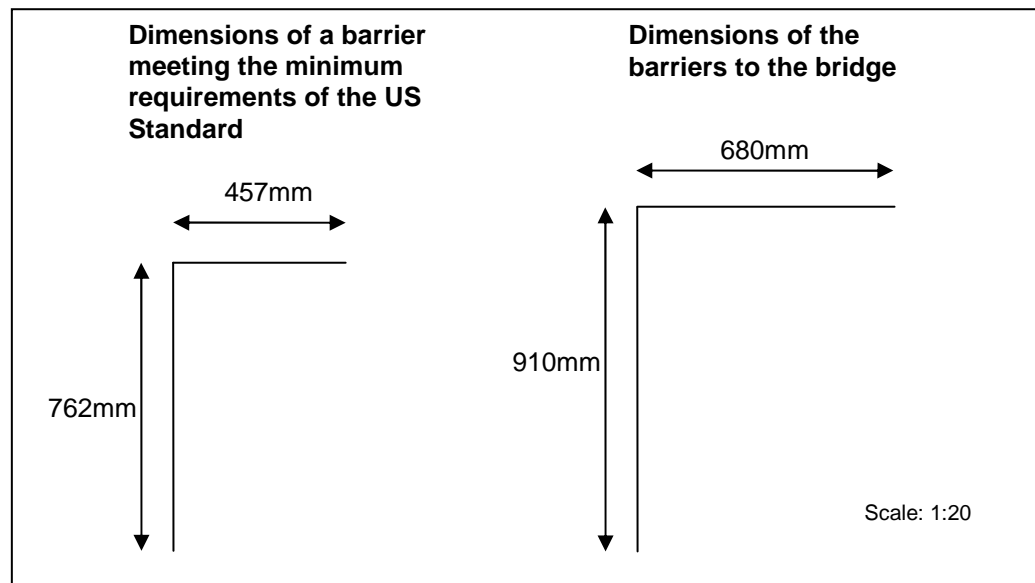
$$B = 1219 - 762 = 457\text{mm}$$

The as built width is 680mm, and therefore exceeds the minimum 457mm dimension set by the US standard.

⁴ The predecessor to the Department of Building and Housing

⁵ The US Standard has a minimum barrier height of 1067mm, instead of the 1000mm required by F4/AS1. Therefore any barrier meeting the requirement of the US Standard exceeds the requirement of the Building Code

- 5.4.11 The following sketch demonstrates the bridge barrier compared to the minimum barrier allowed for in the US Standard:



- 5.4.12 Accordingly, for the reasons I have described in paragraphs 5.4.1 to 5.4.11, I consider that the barriers, as built, are of an adequate height and comply with Clause F4.3.4(b).
- 5.4.13 I note however, that the width of the top of the barrier provides a platform that, in my view, increases the possibility that people could sit, and possibly stand or walk along its flat top, which requires consideration of whether this configuration complies with Clause F4.3.1 of the Building Code. I discuss this aspect of the barrier in paragraph 5.6.

5.5 The barriers' ability to restrict the passage of children under 6 years of age

- 5.5.1 Clause F4.3.4(g) requires that barriers must restrict the passage of children under 6 years of age in areas likely to be frequented them. As the applicant's bridge is part of a film set for a movie and has a planned ongoing use as a part of a tourist destination, it is likely that young children will frequent it.
- 5.5.2 Paragraph 1.2.1 of F4/AS1 sets out the requirements for barriers in houses and other areas likely to be frequented by children, including the acceptable barrier designs that will achieve this. Figure 3 shows a design for barriers constructed from solid materials; this design contains a specification that any ledge forming part of the design should be no greater than 15mm wide.
- 5.5.3 As I have stated earlier, although the applicant's barriers are not being assessed for compliance against the acceptable solution, it should achieve at least the equivalent degree of protection for children. One of the main features of the designs in F4/AS1 is that they will not allow a young child to easily climb them. However, it is important to note that even these designs are not be incapable of being climbed by all children under the age of six years. Most of them will not be capable of being climbed by children under three years, but older children will climb them if they want to. For these older children, the barrier acts as a deterrent only, as per the

comment in F4/AS1 which states ‘The Clause F4.3.4(g) requirement that barriers restrict the passage of children under 6 years of age does not mean that all children under 6 must be unable to climb them. The Acceptable Solutions given here will prevent almost all children up to the age of 3 years from climbing. They can also be used as a guide for alternative designs.’

- 5.5.4 I must therefore consider whether the proposed barriers will restrict children under-six years from climbing over them to the same extent as an F4/AS1 barrier would. The inside walls of the barriers, although solid, are clad in stone. To give a rustic appearance, these stones are rough-hewn, with some stones projecting beyond others. The maximum projection measured by the expert was 50mm. Although these projections are random in their occurrence, I considered that they are sufficient to afford toe and finger-holds for a small child attempting to climb the barrier. They are also substantially wider than the 15mm maximum described by Figure 3 of F4/AS1.
- 5.5.5 However, it is my view that the width of the top of the barrier (at 680mm minimum) along with the thickness of the capping stones, which are in the order of 250mm thick, compensates for this as there is nothing that a small child can easily grasp, therefore making it difficult to gain purchase.
- 5.5.6 I therefore consider that, in respect of Clause F4.3.4(g) the barrier adequately restricts the passage of children under the age of 6 years old.

5.6 The barrier’s flat top

- 5.6.1 As I have described in paragraph 5.4.13, the width of the top of the barrier provides a platform that increases the possibility that people could sit, and possibly stand, or walk along its flat top. This therefore requires consideration of whether this configuration complies with Clause F4.3.1 of the Building Code.
- 5.6.2 Clause F4.3.4(h) requires that barriers be constructed so that are not readily able to be used as seats. Clause 1.2.3 of the Acceptable Solution F4/AS1 states that barriers in buildings other than houses, with a parapet form of construction, should have a 30° or greater angled top when they are more than 100mm wide, in order to deter people from climbing up onto, or sitting on barriers with platform tops.
- 5.6.3 The width of the top of the barrier provides a platform that, in my view, increases the possibility that people could sit, and possibly stand, or walk along its flat top. At 680mm to 700mm, the barriers’ capping stones are much wider than the 100mm described by F4/AS1 before an angled top is required. The barriers contain no additional design features that will prevent people using the barrier top as a seat, or prevent people falling off the platform, should they have climbed up.
- 5.6.4 Clause F4.3.1 requires that ‘Where people could fall 1 metre or more from an opening in the external envelope or floor of a building, or from a sudden change in level within or associated with a building, a barrier shall be provided.’ The limits on application for Clause F4 state that ‘Performance F4.3.1 shall not apply where a barrier would be incompatible with the intended use of an area, or to temporary barriers on construction sites where the possible fall is less than 3 metres, or to

buildings provided pedestrian access in remote locations where the route served presents similar natural hazards.’

- 5.6.5 In this respect, I note that this bridge is a unique design in that the reasons for the dimensions are related to its use as a film set. The bridge is a small foot bridge only, with an old-fashioned rustic design in that it is narrow and cobbled with very thick barriers in relation to its width and a gentle slope up to its mid-point. In its intended use as a tourist destination it is important that its appearance remains authentic to now it appeared in the film. If the barriers were to be altered to make them narrower or smooth-sided, or to provide them with angled tops this would be incompatible with the intended use.
- 5.6.6 In addition, I consider it relevant that the bridge is remotely located on a private farm and will not be highly trafficked, being used by tour groups which will be taken through the film set in managed and guided tours by the company operating the tours and that, in general, people will be using it when part of an organised tour group or function. Supervision, particularly of young children, can be expected in this context, and although the area will undoubtedly be frequented by children they are unlikely to ever be there alone.
- 5.6.7 The objective of Clause F4 is to ‘safeguard people from injury from falling’. I consider that the current barriers address this objective adequately in respect of its intended use.
- 5.6.8 I note that if, in the future, should the context change around the land being private and the tours being guided, I suggest a sign be attached to the bridge, if the bridge is to remain, to alert people not to climb on the barrier’s flat top.

5.7 Conclusion

- 5.7.1 For the reasons set out above, it is my view that the barriers comply with Clause F4 of the Building Code.

5.8 Other matters

- 5.8.1 I will deal briefly with the issue of waivers and exemptions, as these issues were raised by the parties in their submissions.
- 5.8.2 In its submission that authority stated that it was not prepared to grant a waiver of the requirements of the Building Code. Under section 67 of the Act, a territorial authority may grant an application for a building consent subject to a waiver or modification. I note that the authority issued the building consent without any such waiver, and this option is no longer available to it.
- 5.8.3 I note also that the appropriate time for the authority to have considered both the code compliance of the barriers’ design and whether or not a waiver was justified would have been at the time of granting the building consent.
- 5.8.4 In its submission, the applicant has asked for an exemption from the requirements of the Building Code with respect to the bridge barriers’ height. Under section 188 of the Act I have the power to waive aspects of the Building Code as part of a

determination. I also note that the authority has this power, and a determination did not need to be sought to affect this.

5.8.5 However, as I have found that the barriers as currently constructed comply with the Building Code there is no need to consider a waiver.

6. The decision

6.1 In accordance with section 188, I hereby determine that the barriers to the bridge as currently constructed comply with Clause F4 Safety from falling of the Building Code, and accordingly I reverse the authority's decision to refuse to issue a code compliance certificate for the building work.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 4 April 2012.

John Gardiner
Manager Determinations

Appendix A

The legislation

The relevant provisions of the Building Code are:

CLAUSE F4—SAFETY FROM FALLING

OBJECTIVE

F4.1 The objective of this provision is to safeguard people from injury caused by falling.

FUNCTIONAL REQUIREMENT

F4.2 Buildings shall be constructed to reduce the likelihood of accidental fall.

PERFORMANCE

Provisions	Limits on application
<p>F4.3.1 Where people could fall 1 metre or more from an opening in the external envelope or floor of a building, or from a sudden change in level within or associated with a building, a barrier shall be provided.</p>	<p>Performance F4.3.1 shall not apply where such a barrier would be incompatible with the intended use of an area, or to temporary barriers on construction sites where the possible fall is less than 3 metres[, or to building providing pedestrian access in remote locations where the route served presents similar natural hazards].</p>
<p>F4.3.4 Barriers shall:</p> <ul style="list-style-type: none"> (a) Be continuous and extend for the full height of the hazard, (b) Be of appropriate height, (c) Be constructed with adequate rigidity, (d) Be of adequate strength to withstand the foreseeable impact of people and, where appropriate, the static pressure of people pressing against them, (e) Be constructed to prevent people from falling through them, and (f) In the case of a swimming pool, restrict the access of children under 6 years of age to the pool or the immediate pool area, (g) Restrict the passage of children under 6 years of age when provided to guard a change of level in areas likely to be frequented by them. (h) Be constructed so that they are not readily able to be used as seats. 	<p>Performance F4.3.4(f) shall not apply to any pool exempted under section 5 of the Fencing of Swimming Pools Act 1987.</p> <p>Performance F4.3.4(h) shall not apply to Housing.</p>