Determination 2006/78

Upgrading the means of escape from fire on the alteration of an office building at 110 Symonds Street, Auckland

1 The matter to be determined

1.1 This is a Determination of a dispute under Part 3 Subpart 1 of the Building Act 2004 ("the Act") made under authorisation by me, John Gardiner, Determinations Manager, Department of Building and Housing ("the Department"), for and on behalf of the Chief Executive of the Department.

1.2 The applicant is Tasman Properties Limited, ("the owner") acting through a firm of fire engineers ("the owner's fire engineer"). The other parties are the Auckland City Council ("the territorial authority") and the New Zealand Fire Service Commission ("the Fire Service"), which has the right or obligation to give written notice to the territorial authority in respect of these matters.

1.3 The owner's application for this determination identified the matter for determination is whether, in the alteration of the building, the installation of an automatic sprinkler system, as originally proposed and as included in the building consent for the alteration, is required in order to bring the building to compliance "as nearly as is reasonably practicable" with the provisions of the Building Code that relate to means of escape from fire as required by section 112 of the Act. However, I take the view that I may also consider whether it is reasonably practicable to undertake some other item of upgrading other than the installation of a sprinkler system, see 5.4.3, 5.6.1, and 6.1(b) below.

1.4 Accordingly, I take the view that the matter to be determined is the territorial authority's decision not to amend the building consent. In accordance with section 188, therefore, I must decide whether to:

(a) Confirm the territorial authority's decision with the result that the building consent will not be amended; or

(b) Reverse that decision with the result that the building consent will be amended by omitting the sprinkler system; or

(b) Modify that decision with the result that the building consent will be amended to require additional fire precautions (other than a sprinkler system).

The underlying question is what, if any, amendments to the building consent are necessary to ensure that the building, after the proposed alterations, will comply as nearly as is reasonably practicable with the provisions of the Building Code for means of escape from fire.

1.5 In making my decision, I have not considered any other aspects of the Act or the Building Code.

2 The existing building, the alterations and the sequence of events

2.1 The building was erected in about 1986. It has 10 storeys of office accommodation, with design occupancies of up to 130 people on each storey, and three basement storeys used for carparking. The storeys above ground give the appearance of two irregularly-shaped towers containing offices and connected by a rectangular section containing lifts, stairways, and sanitary facilities. The building's fire safety provisions comply with NZS 1900 Chapter 5 as it applied at the time of erection.

2.2 The escape height (as defined in C/AS1, the acceptable solution for clauses C1, C2, C3, and C4 of the Building Code) is 30 m. The existing building has the following fire safety provision (described in terms of Table 4 of C/AS1), which are set out together with the provisions required by C/AS1:

Existing	**C/AS1**
• Two means of escape	• Two means of escape
• F90 separation between firecells	• F30 separation between firecells
• Type 3f automatic fire alarm with heat detectors	• Type 6 automatic fire sprinkler system with manual call points
• Type 14 fire hose reels	• -
• Type 15 Fire Service lift control	• Type 15 Fire Service lift control
• Type 16 emergency lighting	• Type 16 emergency lighting
• Dry riser hydrants.	• Type 18 Fire hydrant system.

2.3 The current alterations are described as "minor fit-out work" or "refurbishment" of the ground floor and two upper floors (levels 4 and 9), and involve internal partitions and ceilings, the installation of kitchens on each floor and a "lab room" on level 9.

2.4 The territorial authority informed me that, in July 2005, the owner applied for two building consents for the proposed alterations. Each application was accompanied by a separate fire report from an asset management company. Those reports were reviewed

by the territorial authority, and after correspondence between the territorial authority and the owner, the owner submitted a new fire report that proposed the installation of a Type 6 sprinkler system throughout the building together with certain other items of upgrading. The territorial authority granted a building consent accordingly. However, the owner disputed that building consent, and engaged the owner's fire engineer to prepare additional fire report information for the purposes of this determination. In a fax dated 23 August 2005, the territorial authority's fire engineer responded to a report by the owner's fire engineer and said that in the territorial authority's opinion:

> 1. . . . the following are the main alterations to the building for means of escape upgrade:
>
> a. Type 6 automatic sprinklers [automatic fire sprinkler system with manual call points] installed to NZS 4541: 2003 (fire report part 4)
>
> b. Protected paths provided at the entry points of the safe paths and lift entries fire report part 6)
>
> c. Smoke seals to be provided to existing safe path doors (fire report part 3)
>
> 2. Applicant to confirm that either lift lobbies are provided on all the upper levels or smoke detection will be provided . . . .

2.5 The owner's fire engineer says that the territorial authority's fire engineer orally requested that the owner "apply for a Determination to provide the Council with specific guidance".

3 The legislation

3.1 Section 112 of the Act reads:

> (1) A building consent authority must not grant a building consent for the alteration of an existing building, or part of an existing building, unless the building consent authority is satisfied that, after the alteration, the building will—
>
> (a) comply, as nearly as is reasonably practicable with the provisions of the building code that relate to—
>
> (i) means of escape from fire; and
>
> (ii) access and facilities for persons with disabilities (if this is a requirement in terms of section 118); and
>
> (b) continue to comply with the other provisions of the building code to at least the same extent as before the alteration.
>
> (2) Despite subsection (1), a territorial authority may, by written notice to the owner of a building, allow the alteration of an existing building, or part of an existing building, without the building complying with provisions of the building code specified by the territorial authority if the territorial authority is satisfied that,—
>
> (a) if the building were required to comply with the relevant provisions of the building code, the alteration would not take place; and

(b) the alteration will result in improvements to attributes of the building that relate to—

(i) means of escape from fire; or

(ii) access and facilities for persons with disabilities; and

(c) the improvements referred to in paragraph (b)outweigh any detriment that is likely to arise as a result of the building not complying with the relevant provisions of the building code.

4 The original submissions

4.1 General

4.1.1 From the original submissions, I understand that the owner intends to upgrade the building so that it complies with the requirements of C/AS1 except that:

(a) Firecell ratings will remain at F90/60 rather than the F30 required by C/AS1, and

(b) The Type 6 sprinkler system required by C/AS1 will not be installed.

4.1.2 The only question for determination is whether it is reasonably practicable to undertake additional upgrading such as the installation of a sprinkler system, although, as I note later, I am not precluded from considering the practicability of installing other fire safety systems if I find these reasonable to require in the context of this upgrade.

4.2 The original submissions

4.2.1 The application for determination was accompanied by submissions from the owner's fire engineer. At my request, that engineer subsequently provided the fire report referred to in the territorial authority's fax of 23 August 2005 (see 2.4 above), and also provided correspondence with the territorial authority about certificates of public use, including the owner's application for an issued certificate, together with further submissions.

4.2.2 As to the matter to be determined, the submissions said:

"We seek Determination that it is not a requirement under section 112 (alterations) of the Act in conjunction with section C2 (means of escape of occupants) of the Code to install sprinklers in this particular existing building."

4.2.3 The submissions discussed what it said was the territorial authority's policy of "rigidly enforcing full upgrades of all existing buildings to the present day requirements [of C/AS1]", and claimed that the alleged policy:

> . . . is fundamentally at odds with the intent of section 112 of the Act. First, on the basis that we propose . . . to demonstrate on an Alternative Solution basis that this building complies 'as nearly as is reasonably practicable' with section C2 of the Code (means of escape from fire) without sprinkler protection. Secondly, that the concept of

equivalence with C/AS1 as the only acceptable means to demonstrate Code compliance is at odds with the intent of a performance based Building Code.

4.2.4 As to those matters, I consider that:

(a) The territorial authority's alleged policy, and the alleged reasons for it, are not relevant to this determination.

(b) The concept of "equivalence" with C/AS1 is different from the concept of compliance "as nearly as is reasonably practicable" with the Building Code.

(c) As to the claimed "Alternative Solution basis". I understand the term "alternative solution" to refer to a building that complies completely with the Building Code but does not comply with either a solution, whether an acceptable solution or a verification method, specified in compliance documents such as C/AS1. If there is such an alternative solution then I consider that it may be used as a benchmark or yardstick when considering items of upgrading. However, in this case I do not accept that any such alternative solution has been identified.

4.2.5 The submissions referred to the statement by an officer of the Department to the effect that under section 112, minor alterations to an office building would not require major upgrade works such as the installation of a sprinkler system. That general statement was not intended to be, and was not, binding on me in respect of any particular determination, and is not relevant to this determination.

4.2.6 The submissions discussed section 112(2). In my view, that covers certain special situations in which it is necessary to consider both the building's means of escape from fire and its access and facilities for use by people with disabilities. That is not the case with this determination.

4.2.7 The submissions claimed that, by issuing a certificate of public use under section 363A(2), the territorial authority had certified that it was satisfied that members of the public could use level 4 of the building safely, so that it was inconsistent for the territorial authority to require the installation of a sprinkler system. I have not been asked to determine the validity of that certificate, but I take the view that it involves considerations different from those under section 112. In particular, that is because such a certificate may be subject to conditions and applies only during the course of construction and not after a code compliance certificate has been issued for the work concerned. Accordingly, I consider that the certificate of public use is not relevant to this determination.

4.2.8 The submissions argued that section 112 was less demanding than the previous section 38 of the Building Act 1991 because under the current Act the test was "as nearly as is reasonably practicable" whereas under the 1991 Act it had been "as nearly as is reasonably practicable as if it were a new building". I take the view that the difference in wording has no substantive effect because whether the building concerned is new or not does not affect the question of whether it complies with the Building Code completely or to any particular extent.

4.2.9 As to the installation of a sprinkler system throughout the building, the submissions for the owner said:

(a) The building's escape height of 30 m is only 5 m higher than the 25 m at which C/AS1 requires a sprinkler system.

(b) Installing a sprinkler system would cost "about $1,000,000 or in the order of 5 to 10% of the building's value, and would include significant secondary business disruption costs".

(c) A sprinkler system in this particular building would achieve:

> little or no actual improvement to building occupant safety. Historic data would confirm that office buildings in our country have a very low, almost non-existent, incidence of occupant fire injury or death. . . .
>
> In this particular building, we submit that [F90/60] passive fire rated construction is an adequate means alone of protecting occupants during escape from the building and without the need for sprinkler protection. . . .
>
> The fire safety of occupants in a particular office firecell is essentially unrelated to building height provided they have adequate warning of fire . . . . A fire sprinkler system requirement in office buildings (non-residential) of more than 25 m height is essentially for Fire Service fire fighting requirements . . . based historically on Fire Service access and fire fighting limitations . . .

(d) The minor alterations did not justify major upgrading such as the installation of a sprinkler system.

4.2.10 Neither the territorial authority nor the Fire Service made any submissions at that stage.

4.3 The first draft

4.3.1 Because a formal hearing had been requested, I sent the parties a draft determination ("the first draft") with a request that they either accept it, subject to any non-controversial amendments, or identify points that they wished to raise at a hearing.

4.3.2 The first draft was to the effect that the comparatively minor alterations did not justify the costs of installing a Type 6 sprinkler system throughout the building but did justify the costs of upgrading the current Type 3f alarm system to a Type 4 system throughout the building.

4.3 The owner accepted the first draft subject to certain amendments. I was not satisfied that those amendments were in fact non-controversial.

4.3.4 The territorial authority and the Fire Service did not accept the first draft and made specific submissions on it for the purposes of a formal hearing.

4.4 The second draft

4.4.1 In the light of the responses to the first draft, I prepared a revised draft ("the second draft"), which I sent to the parties for their consideration and for use at the hearing.

4.4.2 The second draft was to the same effect of the first draft but referred to and discussed the parties' responses to the first draft.

4.4.3 The owner's response to the second draft was to the effect that:

(a) Upgrading the alarm system was not reasonably practicable because it would "essentially mean rewiring and a total new installation of a smoke detector system on all but the parking levels" and would achieve only a "minor increase in life safety".

(b) If upgrading of the alarm system was required, then in accordance with paragraph 4.5.10 of C/AS1 it should be on only the two uppermost office levels, because the lower levels had an escape height not exceeding 25 m for which Table 4.1/2 requires only a Type 3 alarm system.

(c) For other similar buildings, the territorial authority had accepted staged upgrading on a floor-by-floor basis as each floor was refurbished, and the owner requested that I take the same approach, bearing in mind that the safe path had F60 or higher fire ratings.

4.4.4 The territorial authority's response to the second draft was to the effect that a sprinkler system should be installed throughout the building, and that in particular:

(a) The alterations could not properly be described as "minor". They had an estimated value of $459,000 and must be seen in the context of previous alterations, made without any significant upgrading of the means of escape from fire, totalling $1,183,850 over the previous five years.

(b) The owner's claim that installing a sprinkler system would cost "about $1,000,000", see 4.2.9(b) above, needed to be supported by proper documentation.

(c) The draft placed too much reliance on passive protection, which was "much less reliable than that of a sprinkler system", saying: "This approach would give the impression that passive barriers are given credit for 100% reliability".

(d) The owner's submission that the building had "F90/60 firecell separations instead of the F30 required by C/AS1" was incorrect because in fact C/AS1 required "a fire separation of 60/60/60 for the safe path stairs for escape height greater than 10 m". That point is not further discussed because it has no effect on my conclusions, see 5 below.

(e) Additional information was provided as to the sequence of events. I have revised the draft in the light of that information.

4.5 The Fire Service's response to the second draft was also to the effect that a sprinkler system should be installed throughout the building. In particular, the Fire Service said that certain passages in the second draft were inconsistent with each other or needed to be clarified. Those clarifications have been made but are not further discussed.

4.6 The third draft

4.6.1 Although it had been intended that there would be a formal hearing in the context of the second draft, there were difficulties in arranging for such a hearing, and I therefore prepared a third draft which I sent to the parties for their consideration.

4.6.2 The third draft was to the same effect as the second draft but referred to and discussed the parties' responses to the second draft.

4.6.3 The owner accepted the third draft.

4.6.4 The territorial authority commented on:

(a) The difference between complying with the Building Code and complying as nearly as is reasonably practicable, see 5.1 below;

(b) The term "alternative solution", see 5.1 below; and

(c) Certain minor issues and editorial corrections which have been incorporated.

4.6.5 The Fire Service suggested that the third draft should be amended so as to clarify or expand on certain points. Those suggestions have been taken into account.

5 Discussion

5.1 General

5.1.1 The matter to be determined turns on whether, after the proposed alterations, the building would comply as nearly as is reasonably practicable with certain provision of the Building Code. However, the terms "alternative solution", "alternative design", and "performance-based design" have been used in the submissions, and in commenting on the third draft the territorial authority said:

> Practical Definition of Alternative Solution – as has been commonly used in the industry and supported by BC Update No. 9 – 17 Mar 2005, an Alternative solution is any fire design not complying completely with the applicable compliance document. The term alternative solution was used throughout that Update. Very few alternative designs are full performance based design most are Acceptable Solutions with modifications.
>
> Even an existing building that contains a significant alteration it would seem appropriate that part of the review of the situation would involve review of compliance with the NZ Building Code. The extent to which a building varies from the Acceptable Solution or varies from the level of safety provided by the Acceptable Solution should be evaluated as an alternative solution.

("BC Update" is a periodic email news service offered by the Department of Building and Housing. BC Update No. 9 was essentially a reprint of a Fire Service publication together with a *Gazette* notice.)

5.1.2 Determinations issued to date have used the terms "acceptable solution" and "alternative solution" to mean:

> **acceptable solution**: one of the acceptable solutions (but not one of the verification methods) specified in a compliance document

> **alternative solution**: a building design that complies completely with the Building Code but does not comply with either an acceptable solution or a verification method specified in a compliance document.

Those terms apply in respect of all provision of the Building Code, not merely the fire safety provisions. The critical point is that any alternative solution must comply with the Building Code. To put it another way, a design that does not comply with the Building Code cannot properly be called an alternative solution.

5.1.3 I understand that the term "performance design" is used, particularly in Australia, to mean a design based on calculations not complying with a verification method (in fact, there is no verification method for fire design). I assume the term "alternative design" is used to mean the same as "alternative solution". I do not think any useful purpose would be served, at least in determinations, by using such terms as "alternative design", "performance-based design", or "performance solution" that might obscure the fact that building consents must be issued only in respect of:

(a) The erection of new buildings that will comply completely with the Building Code (subject to any waivers or modifications granted by the territorial authority under section 67); or

(b) The alteration of existing buildings that, after the alteration, will comply as nearly as is reasonably practicable with specified provision of the Building Code.

5.1.4 The "as nearly as is reasonably practicable" test under the previous section 38 of the Building Act 1991 is discussed in numerous determinations[1] issued by the previous Building Industry Authority ("the Authority"). I take the view that substantively the same test applies under the current Act, see 4.8 above. I conclude that the approach taken by the Authority under the Building Act 1991 remains the correct approach under the current Act.

5.1.5 In considering any particular item of upgrading, the Authority applied the interpretation of the words "as nearly as is reasonably practicable to the same extent as if it were a new building" decided by the High Court in *Auckland City Council v New Zealand Fire Service* [1996] 1 NZLR 330, an appeal against Determination 93/004, in which it was held that:

> [Whether any particular item of upgrading is required] must be considered in relation to the purpose of the requirement and the problems involved in complying with it, sometimes referred to as "the sacrifice". A weighing exercise is involved. The weight of the considerations will vary according to the circumstances and it is generally accepted that where considerations of human safety are involved, factors which impinge upon those considerations must be given an appropriate weight.

5.1.6 Applying that approach, the life safety benefits of additional upgrading to comply with C/AS1, such as installing a sprinkler system must be weighed against the sacrifices identified by the owner's fire engineer, see 4.2.9 and 4.4.3 above.

[1] See Determinations 1993/2, 1993/3, 1993/4, 1994/2, 1994/5, 1995/2, 1995/6, 1996/1, 1996/5, 1997/1, 1997/2, 1997/9, 1999/1, 1999/15, 2001/4, 2002/2, 2002/5 and 2002/8.

5.1.7 The owner's original submissions were concerned only with the installation of a sprinkler system throughout the building. However, installing such a system is not the only item of additional upgrading that must be considered. The sacrifices involved in each such item must be weighed against the benefits of that item.

5.1.8 In response to the second draft, see 4.4.3 above, the owner claimed that it would not be reasonably practicable to upgrade the alarm system. I cannot accept that claim in the absence of any explanation as to what is meant by a "minor" effect on life safety and of any specific costs of the upgrading, or even of an estimate such as was given for installing a sprinkler system, see 4.2.9 above.

5.1.9 In response to the second draft, see 4.4.3 above, the owner also claimed that under paragraph 4.5.10 of C/AS1, the alarm system should be upgraded only on the two uppermost floors. I cannot accept the owner's interpretation of that paragraph, which reads:

> **4.5.10** Where by Table 4.1 any *firecell* in a *building* requires a Type 3 [automatic fire alarm system with heat detectors and manual call points], Type 4 [automatic fire alarm system with smoke detectors and manual call points], Type 6 [automatic fire sprinkler system with manual call points] or Type 7 [automatic fire sprinkler system with smoke detectors and manual call points] alarm:
>
> a) All other *firecells* on all floors in that *building* shall have no less than a Type 3 alarm, except that
>
> b) Where any *firecell* having an *escape height* greater than 25 m requires a Type 6 or 7 alarm, all lower floor levels in the *building* shall have no less than a Type 6 alarm. In such situations the Type 6 alarm shall replace any Type 2, 3 or 4 alarm otherwise required for lower *firecells*.

Table 4.1 requires a Type 6 alarm system for the highest firecell in the building concerned, so that as I read paragraph 4.5.10(b) all lower levels require "no less than" a Type 6 system in order to comply with C/AS1.

5.1.10 In response to the second draft, see 4.4.3 above, the owner also claimed that, for other buildings, the territorial authority had accepted staged upgrading on a floor-by-floor basis and requested that I take the same approach so that only those floors being refurbished would be required to be upgraded. Staged upgrading is discussed briefly in 5.1.15 below, suffice it to say at this point that I consider that each case must be treated on its merits and take the.view that, under section 112(1)(a)(i), a building consent must not be granted for any alteration unless, after the alteration, the entire building will comply as nearly as is reasonably practicable with the provisions of the Building Code that relate to means of escape from fire.

5.1.11 In response to the third draft, the territorial authority said:

> It appears that under the guide [sic] of reasonably practicable there can be a significant lowering of fire safety in a building. . .
>
> If this building had been a new building and submitted as an alternative solution [it] would have been benchmarked against the Acceptable Solution in terms level of safety. . .

5.1.12 I disagree that section 112 permits any "lowering of fire safety" (or of any of the other required attributes of the building, see section 112(1)(b)). However, as a matter of legislative policy, section 112 does not require an existing building to be made as safe as if it were a new building.

5.1.13 In order to assess whether an existing building complies with the Building Code "as nearly as is reasonably practicable", it is usually necessary to identify what upgrading would be necessary for complete compliance. As the Fire Service said in response to the third draft:

> . . . the 'reasonably practicable' test is a two-stage process. Firstly, the alterations to the building needed to comply fully with the Code need to be determined. Then the sacrifice/benefit test needs to be applied to those alterations to determine which alterations are 'reasonably practicable'.

On way of identifying what is necessary for complete compliance is, as the territorial authority put it, to benchmark the building against the acceptable solution. That is what was done in Determination 93/004, see 5.1.5 above.

5.1.14 Applying that approach, I conclude that:

(a) Under section 112(1)(a)(i), a building consent for any alteration must not be granted or amended unless, after the alteration, the entire building will comply as nearly as is reasonably practicable with the provisions of the Building Code that relate to means of escape from fire.

(b) The proposed alterations, without the sprinkler system, will not achieve compliance as nearly as is reasonably practicable.

(c) It is not reasonably practicable to install a sprinkler system throughout the building.

(d) It is therefore necessary to consider other items of upgrading.

5.1.15 In the absence of any information from the owner as to such other items, I observe that they could include (but are not necessarily limited to):

(a) Upgrading the Type 3 alarm system throughout the building to a Type 4 system.

The owner did not propose such upgrading, so that I have no specific information on the sacrifices involved. Nevertheless, in previous drafts I said that I considered that upgrading the alarm system would be reasonably practicable. In response to the second draft, the owner disagreed, see 4.4.3(a) above, but by accepting the third draft indicated a change of mind. I therefore conclude that it is reasonably practicable to upgrade the alarm system.

(b) Installing, but not necessarily commissioning, a sprinkler system only on the ground floor and levels 4 and 9, the fit-out floors" on the understanding that the system will be extended to cover other floors as they in turn are altered with the intention that the entire building will be covered at some future time.

As currently advised I take the view that "staged upgrading" proposals along those lines may be taken into account by a territorial authority when it is considering what is “reasonably practicable”. However, the territorial authority will also need to take into account that:

(i) The test remains the balance between benefits and sacrifices.

(ii) Systems such as alarms and sprinklers are of no benefit until they have been commissioned.

(iii) Postponing or staging any particular item of upgrading might reduce the corresponding sacrifice but will always reduce the corresponding benefit.

(iv) There might be enforcement difficulties with future stages.

In this case, however, in the absence of detailed proposals by the owner, I am unable to come to any conclusions on the matter and therefore give no further consideration to such staged upgrading.

5.1.16 I consider that it would be good practice for the owner, before applying for a building consent, to consider a wide range of upgrading options. A better net benefit could well arise from an option not immediately considered. The application for building consent should be in respect of the option that, in the owner’s opinion, gives the best balance between sacrifices and benefits. The application should identify all the options that have been considered and the sacrifices and benefits associated with each.

5.2 Firecell ratings and escape height

5.2.1 The owner said that the building’s escape height is “only 5 m higher than the 25 m at which C/AS1 requires a sprinkler system”. I take that to be an argument to the effect that the omission of a sprinkler system is only a minor non-compliance with C/AS1. I disagree, the escape height of the building could equally well be described as 20% higher, or as including an additional two storeys containing up to an additional 260 people, which cannot be seen as minor.

5.2.2 I do not place any great weight on that argument.

5.2.3 I conclude that in order to comply completely with C/AS1, and therefore with the Building Code, the building needs a Type 6 sprinkler system.

5.3 Sacrifices involved in installing a sprinkler system

5.3.1 The only sacrifice involved in installing a sprinkler system was its cost. The owner said that it would cost “about $1,000,000 or in the order of 5 to 10% of the building’s value, and would include significant secondary business disruption costs”.

5.3.2 I accept that the cost of any particular item of upgrading must be seen as a sacrifice that is relevant to whether the item is reasonably practicable.

5.3.3 However, in Determination 95/002 the Authority said that the cost of any particular item of upgrading was to be considered in relation to the benefits of the item not to the

cost of the alterations that triggered consideration of upgrading. I agree, and also consider that the cost of upgrading is not to be considered in relation to the value of the building, see also 5.5 below.

5.3.4 I take the territorial authority's point that the $1,000,000 cost of installing a sprinkler system is not supported by any specific documentation. Nevertheless, I consider that in this case the costs, including business disruption costs, represent a significant sacrifice.

5.4 Contribution to life safety

5.4.1 The owner said that a sprinkler system would achieve "little or no actual improvement to building occupant safety" because of:

(a) The historically low incidence of fire injuries and death in New Zealand,

(b) The F90/60 firecell separations instead of the F30 required by C/AS1,

(c) The alleged lack of any relationship between building height and life safety as distinct from Fire Service fire fighting requirements.

5.4.2 As to the historical experience:

(a) The Fire Service responded that New Zealand's fire safety record "may well rely on the sprinkler systems being in place for tall buildings".

(b) The argument amounts to saying that C/AS1 is too restrictive. That is not a matter that I can decide by way of a determination, any necessary amendment to C/AS1 must be processed by the consultative procedures of section 29 of the Act. I place no weight on that argument.

5.4.3 As to the submission that there is no relationship between building height and life safety, that also amounts to a criticism of C/AS1 which I cannot decide by way of a determination.

5.4.4 As to the firecell separation:

(a) In the draft, I accepted that in those fire scenarios where life safety depends on protection from a fire in another firecell, then higher-rated firecell separations will give people a longer time in which to escape. However, that is not the case for people in the same firecell as the fire, who need adequate warning before the fire can engulf the firecell. In that case, a Type 6 automatic sprinkler system throughout the building will clearly improve life safety by giving occupants longer in which to escape.

(b) The territorial authority objected, see 4.5.2(c) above, that this placed too much reliance on passive protection and gave the impression that passive barriers had 100% reliability. I did not intend to give that impression, and recognise that neither passive nor active protection or combination of both, can be assumed to be 100% reliable. However, that does not affect my observation that alarm systems, unlike passive protection, increase the time available for people to escape from the fire cell in which a fire occurs.

5.4.5 However, the objective of increasing life safety would be achieved, although to a lesser extent than by installing a Type 6 sprinkler system, by other items of additional upgrading, and in particular by upgrading the building's fire alarm system from the current Type 3(f) system with heat detectors but no direct connection to the Fire Service, to a Type 4 system with smoke detectors and a direct connection to the Fire Service.

5.4.6 I mention upgrading the alarm system from Type 3f to Type 4 as an obvious example of the range of options that I consider owners should evaluate when attempting to establish the extent of upgrading that is reasonably practicable. It is usually not sufficient to restrict the evaluation to merely one option.

5.4.7 I consider that upgrading the fire alarm system would benefit life safety throughout the building and would involve less sacrifice than installing a sprinkler system. As mentioned in 5.1.8 above, I do not accept the owner's claim that it would not be reasonably practicable to upgrade the fire alarm system.

5.4.8 I therefore conclude that upgrading the current alarm system from Type 3f to Type 4 would significantly improve life safety, although not to the same extent as if a Type 6 sprinkler system were installed throughout the building.

5.5 Minor alterations not justifying major upgrading

5.5.1 The owner submitted that the minor alterations did not justify major upgrading such as the installation of a sprinkler system. In response to the first draft, the territorial authority queried whether the proposed $459,000 alteration (in addition to a previous $1,183,850) could properly be described as "minor", see 4.5.2(b) above. I offer no opinion as to whether alterations costing almost half a million dollars can properly be described as "minor". Arguably, an alteration that requires a building consent cannot properly be called "minor".

5.5.2 Be that as it may, I take the view that:

(a) Section 112 requires upgrading to be considered in relation to any alteration that requires a building consent.

(b) In applying the "as nearly as is reasonably practicable" test, I cannot take account of previous alterations but must be conscious of the cumulative effect of possible future alterations, see (d) below.

(c) As mentioned in 5.3.3 above, the cost of any particular item of upgrading, or indeed any other such sacrifice, is to be considered in relation to the benefits of the item.

(d) There is no logical connection between the cost of the proposed alteration without upgrading and whether any particular item of upgrading is reasonably practicable (except insofar as the alteration itself affects the cost of the upgrading). Nevertheless, the extent of the proposed alteration is arguably part of the particular circumstances in which the "reasonably practicable" test must be applied. In Determination 95/002, for example, the Authority took account of the nature and extent of the alterations concerned but warned that:

> . . . it is advisable to bear in mind the possibility of a series of alterations over a period of time, which, even if some or all of them are comparatively minor, might significantly affect the extent to which an existing building complies with the building code.

However, I do not need to make any decision on that point because, as discussed above, the other submissions satisfy me that it would be reasonably practicable to upgrade the fire alarm system but not to install a sprinkler system. Accordingly, I offer no opinion as to the Authority's approach in Determination 95/002.

5.5.3 In Determination 2002/5, the Authority did not accept a submission that the issuing of a previous building consent for alterations to the complex in 1996 meant that in 2002 the existing parts of the complex must be accepted as complying as nearly as is reasonably practicable with the relevant provisions of the Building Code. I agree. Accordingly, if I were to decide that it was not reasonably practicable to install any particular item of additional upgrading on this occasion that would not prevent the territorial authority, or me, from deciding that additional upgrading must be provided as a result of future alterations. That is so even if, as seems likely, future alterations will also be "fit-out" changes that will not affect the extent to which the building as a whole complies with the Building Code.

6 Conclusion

6.1 I conclude that, by balancing of benefits against sacrifices, it is not reasonably practicable to install a Type 6 sprinkler system throughout the building but is reasonably practicable to upgrade the current Type 3f alarm system to a Type 4 alarm system throughout the building.

7 Decision

7.1 In accordance with section 181 of the Act, I hereby determine that:

(a) It is not reasonably practicable to install a Type 6 sprinkler system, but

(b) It is reasonably practicable to upgrade the fire alarm system throughout the building from the current Type 3(f) system to a Type 4 system with smoke detectors and a direct connection to the Fire Service.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 25 August 2006.

John Gardiner
Determinations Manager