Determination No. 2004/27

Fire separation between household units in the subdivision of use of a residential building

1 THE MATTER TO BE DETERMINED

1.1 The matter before the Authority is a disputed decision by a territorial authority to issue a code compliance certificate in respect of alterations to subdivide an old house into a unit-titled multi-unit dwelling in which the fire rated walls along the internal title boundaries do not go down to the ground. Some of those boundaries are between two apartments, and some are between apartments and corridors. However, those corridors are "other property" and the requirements of the building code in respect of fire separation apply equally to each internal boundary. For simplicity, the following discussion is expressed in terms of separations between apartments.

1.2 The Authority was specifically asked to determine whether fire rated walls between apartments must extend through the subfloor space to the ground below the units in order to comply with clause C3.3.2(c) of the building code (the First Schedule to the Building Regulations 1992).

1.3 Under section 46 of the Building Act 1991 ("the Act"), the subdivided building is required to comply "as nearly as is reasonably practicable to the same extent as if it were a new building" with the provisions of the building code for means of escape from fire and for the protection of other property.

1.4 In making its determination, the Authority has not considered any other aspects of the Act or the building code.

2 THE PARTIES

2.1 The matter arose out of a dispute over the alterations between the two persons responsible for the subdivision and alterations. One, ("the applicant") was an owner, being the unit title holder of one of the apartments. The other ("the developer") was no longer an owner and therefore not entitled to be a party, but was sent copies of the application and submissions, and was given the opportunity to make its own submissions as an "appropriate person" in terms of section 19(1)(b).

2.2 The other parties were the unit title holders of the other apartments and the territorial authority.

3 THE BUILDING AND THE SEQUENCE OF EVENTS

3.1 The two storey wooden building was constructed early last century. In 1998 the building was owned by the applicant, who sold it to the developer in the course of an arrangement whereby the building was to be converted to six unit-titled apartments. A building consent for the alterations was duly issued, as were unit titles for the individual apartments. The three apartments on the upper floor were sold to the applicant. The applicant and the developer agreed to complete, to the stage where the code compliance certificate could be issued, and within certain time limits, the building work on the ground floor and upper floor apartments respectively. The code compliance certificate was issued in 2002, but the time limits had not been achieved and the matter went to litigation.

3.2 The building is protected by an automatic sprinkler system, but that system does not cover the subfloor space. The fire-rated inter-tenancy walls do not go down to the ground. There is therefore an undivided subfloor space beneath all the ground floor apartments and common areas, including escape routes. The floor separating the ground floor apartments from the sub-floor space consists of a layer of 20 mm particleboard laid over the existing 20 mm tongue-and-groove kauri flooring.

3.3 The building consent was issued on the basis of a fire report by a consulting fire engineer ("the designer") which was checked by another consulting fire engineer engaged by the territorial authority ("the territorial authority's consultant").

3.4 The building consent was accompanied by a list of "conditions", including:

> "9 All requirements of [the designer's fire report] shall be complied with."

3.5 During construction, one of the territorial authority's building officials queried the fact that the walls concerned did not extend to the ground. The territorial authority's consultant advised that he had understood that they would do so, but the designer responded with reasons why he did not consider that the walls needed to extend to the ground. The territorial authority accepted the walls as constructed, but only after the rules of the body corporate had been amended to the effect that the subfloor space was not to be used for storage nor contain any machinery that could create a fire hazard, and was not to be entered except for maintenance purposes.

4 THE LEGISLATION AND THE APPROVED DOCUMENTS

4.1 The relevant provisions of the Act are:

> **16. Definition of "party"** In sections 17 to 21 of this Act, "party" means—
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> (a) The territorial authority affected; and
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> (b) Any building certifier affected; and
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> (c) The owner affected; and
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> (d) The owner of other property (if the matter for determination relates to a provision in the building code that has the purpose of protecting that other property); and

17. Matters of doubt or dispute relating to building control (1) If any doubt or dispute arises in respect of—

(a) Whether particular matters comply with the provisions of the building code; or

(b) The territorial authority's decision in relation to—

(i) The issuing of or the refusal to issue, or the cancellation of, any building consent, notice to rectify, code compliance certificate, or compliance schedule, or any amendment thereto; or

(ii) Any condition attached to a building consent, notice to rectify, code compliance certificate, or compliance schedule, or any amendment to any such condition; or

(iii) The granting or refusal of any waivers or modifications under section 34(4) of this Act; or

(c) The issuing of, or the refusal to issue, a code compliance certificate under section 43 of this Act or a building certificate under section 56 of this Act; or

(d) The exercise by a territorial authority of its powers under sections 38 and 46 of this Act, and the issuing of a certificate under section 224(f) of the Resource Management Act 1991—

any of the parties may apply to the Authority for a determination in respect of the doubt or dispute.

18. Matters before Authority An application to the Authority under section 17 of this Act shall be limited to whether or not, or to what extent, particular building work or proposed building work (including any actual or proposed demolition) complies with all of the provisions, or with any particular provision, of the building code, or to whether or not the exercise by a territorial authority of the powers referred to in section 17(1)(d) of this Act is unreasonable in relation to the provisions of the building code.

46. Change of use of buildings, etc

(2) The use of the building shall not be changed unless the territorial authority is satisfied on reasonable grounds that in its new use the building will—

(a) Comply with the provisions of the building code for means of escape from fire, protection of other property, sanitary facilities, and structural and fire-rating behaviour, and for access and facilities for use by people with disabilities [(where this is a requirement in terms of section 47A of this Act)] as nearly as is reasonably practicable to the same extent as if it were a new building; and

(b) Continue to comply with the other provisions of the building code to at least the same extent as before the change of use.

(4) Where a territorial authority is required to consider an application for the issue of a certificate pursuant to section 224(f) of the Resource Management Act 1991 for the purpose of giving effect to a subdivision which affects a building or any part thereof, the territorial authority shall only issue that certificate if it is satisfied on reasonable grounds that the building will—

(a) Comply with the provisions of the building code for means of escape from fire, protection of other property, and access and facilities for use by people with disabilities [(where this is a requirement in terms of section 47A of this Act)] as nearly as is reasonably practicable to the same extent as if it were a new building; and

(b) Continue to comply with the other provisions of the building code to at least the same extent as before the application for a subdivision affecting that building or part thereof was made.

4.2 The relevant provisions of the building code are:

(a) Clause A2:

Fire resistance rating (FRR) The term used to classify fire resistance of primary and secondary elements as determined in the standard test for fire resistance, or in accordance with a specific calculation method verified by experimental data from standard fire resistance tests. It comprises three numbers giving the time in minutes for which each of the criteria stability, integrity and insulation are satisfied, and is presented always in that order.

(b) Clause C3:

C3.1 The objective of this provision is to:
(a) Safeguard people from injury or illness when evacuating a *building* during *fire*. . . .
(c) Protect adjacent *household unit* and *other property* from the effects of *fire*. . . .

C3.3.2 *Fire separations* shall be provided within *buildings* to avoid the spread of *fire* and smoke to:
(a) Other *firecells*,
(b) Spaces intended for sleeping, and
(c) *Household units* within the same *building* or adjacent *buildings*.
(d) *other property*.

C3.3.4 *Concealed spaces* and cavities within *buildings* shall be sealed and subdivided where necessary to inhibit the unseen spread of *fire* and smoke.

4.3 When the fire report was prepared, the relevant acceptable solution was C3/AS1 in Approved Document C3, read together with the Fire Safety Annex in Approved Document C4. From 1 June 2001 those acceptable solutions were replaced by C/AS1 in the new Fire Safety Approved Document. However, the relevant provisions of C/AS1 are the same as those of C3/AS1.

4.4 Paragraph 2.3.1 of C3/AS1 is now paragraph 6.15.1 of C/AS1, the relevant provisions of which are:

6.15.1 In buildings with an unoccupied subfloor space between the ground and lowest floor . . . the FRR of that floor shall be based on no less than half the firecell rating from Table 4.1, except that no FRR is required when all the following conditions are satisfied:

a) Vertical fire separations and external walls extend down to ground level and enclose the space.

b) Access is available only for intermittent servicing of plumbing, drainage or other static services.

c) The space is not used for storage, and does not contain any installation such as machinery or heating appliances, which could create a fire hazard, except when fire separated from the rest of the subfloor space.

4.5 For this two floor building in purpose group SR, Table B1 of C4/AS1 and Table 4.1/5 of C/AS1 both specify a firecell rating of F30.

4.6 Paragraph F1.1 of C4/AS1 is now paragraph D1.1 of C/AS1, which reads;

D1.1 Wherever sprinklers are required by this acceptable solution, they shall comply with the relevant New Zealand Standard . . .

In this case, the relevant New Zealand Standard is NZS 4541:1996. Clause 207.1(c) of NZS 4541 provides the following exception to the general requirement for a sprinkler protected building to be sprinklered throughout:

> (c) Concealed spaces between the ground and the floor immediately above where . . . either of the following criteria is met:
>
> (ii) The floor is other than concrete and of tight construction and the space is not accessible for storage purposes or entrance of unauthorized persons, contains no equipment which could be a source of ignition and is protected from the accumulation of debris. . . .

4.7 The relevant provisions of paragraphs 2.14.1 and 2 of C3/AS1, now paragraphs 7.2.1 and 2 of C/AS1, read:

> **7.2.1** When a building is subdivided into cross lease titles, company lease titles or unit titles, each title shall be separated from:
>
> a) An adjacent title, by fire separations having a FRR of no less than the greater of the F or S ratings as determined from Paragraph 5.5, and
>
> b) Any area in common (unless Paragraph 7.2.2 applies), by external walls complying with Paragraph 7.10, except that, if roofed, the area in common shall be a firecell, separated from adjacent titles by fire separations as determined in a) above. If the area in common is a safe path and the FRR required by Paragraph 6.9.2 or 6.9.3 is greater, the greater FRR shall apply.
>
> **COMMENT:**
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> 1. In a) above; vertical fire separations replace the need for external walls between titles. Floors between titles are also fire separations and provide the horizontal separation.
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> **7.2.2** When a *building* is subdivided (as in Paragraph 7.2.1) and all the titles and any areas in common are sprinklered throughout, the requirements for *fire separations* of Paragraph 7.2.1 b) need not apply.

4.8 Matters that need to be taken into account in considering the extent to which the building as altered complies with the acceptable solution C/AS1 are:

(a) Whether, as required by paragraph 6.15.1, the floor above the subfloor space has a FRR of 15/15/15. (That would not be required if the fire separation between titles extended down to the ground, access to the subfloor space was available only for intermittent servicing of utilities, and the space was not used for storage or installations that could create a fire hazard.)

(b) The fact that, contrary to paragraph 7.2.1, fire separations between titles do not extend to the ground. (That would be acceptable under paragraph 7.2.2 if the sprinkler system covered the subfloor space.)

5. THE SUBMISSIONS

5.1 The territorial authority submitted background material, summarised in 3 above. The territorial authority emphasised that it had accepted the designer's fire report on the basis of a check by the territorial authority's consultant, and that when one of its officers had queried whether the walls concerned should be carried down to the

ground, the territorial authority had followed the matter up with the designer, who had said:

"Acceptable solution C3/AS1 of the Building Code requires that vertical fire separations be extended down to ground level to enclose the space and that the space is not used for storage nor contain any machinery that could create a fire hazard. Alternatively the floor is required to have a fire rating not less than half that of the firecell.

"Appendix B: Table B1/7 requires a 30 min. FRR for SR purpose groups without sprinklers. As the building is sprinklered the risk of fire spread through the subfloor spaces is negligible. In any event, the minimum required rating of the floor would be 15mins. And based on a char rate of 0.6mm per minute 9mm of timber would be lost from the flooring in a worst case scenario. The presence of the sprinklers would significantly reduce this and the likelihood of this occurring. Thus, in our opinion, there is no need for subfloor firewalls."

5.2 The territorial authority's consultant commented:

" . . . when documentation submitted for building consent application does not include reference to 'specific fire engineering design' or 'an alternative solution', the fire design is normally reviewed using New Zealand Building Code (NZBC) Acceptable Solutions as a means of compliance with NZBC C2, C3, and C4.

"From my recollection [of the documents submitted with the application for building consent] there was no reference to specific fire engineering design or an alternative solution regarding fire separation of the subfloor space. Furthermore, there was no indication . . . that fire separation in the subfloor space would not be provided."

5.3 The designer said that he had consulted a member of the Authority's staff, who confirmed the designer's interpretation of paragraph 2.3.1 of C3/AS1 (see 7.2 below).

5.4 The designer also discussed the situation if the building were to be subdivided so that the whole of the subfloor space became "common property" rather than that part of the subfloor space beneath a unit being part of that unit, and the rules of the body corporate were amended to require that the proprietors of the ground floor apartments shall:

"(i) Not make or use, or cause to be made or used, access to any sub-floor space (being the enclosed space between the ground level and the lower floor of the building) of his unit or any other unit except for the intermittent servicing of plumbing, drainage, and other static services which may pass through such sub-floor spaces.

"(ii) Not use any sub-floor space for storage purposes and not place or construct in any sub-floor space any installation such as machinery or heating appliances which could create a fire hazard, except when adequate fire separation from the rest of the sub-floor space has been constructed around such installation."

In fact, the rules of the body corporate do preclude occupation or use of any of the subfloor space other than for inspection and maintenance, see 5.12 below.

5.5 The territorial authority said:

"The final design and approval was accepted by Council as an **Alternative Solution** in accordance with the Building Act. Included in this solution was the acceptance of the Body Corporate rules."

5.6 The applicant submitted that C3/AS1 required either a fire rated floor or for a floor without any FRR on the conditions set out in paragraph 2.3.1 of C3/AS1 (6.15.1 of C/AS1). The designer had claimed that the floor had a 15/15/15 fire resistance rating based on charring rates, but:

"The calculation of the structural stability based on charring rates is not a methodology used in . . . C3/AS1 for compliance with the New Zealand Building Code Clause C3 . . . The charring rate calculations used as part of New Zealand Standard 3603:1993 9.4 are used for structural calculations, such as may be used to prove compliance with NZBC Clause C4 . . . .

"Fire resistance rating is a defined term and indicates a requirement for a fire separating load-bearing structure to meet three criteria, stability, integrity and insulation. A structural member such as a floor separating land under different legal titles requires a rating in all three categories."

5.7 The territorial authority also said:

"Council was also concerned about the issue of the sub-floor ventilation, which would have been severely compromised if firewalls were installed from ground floor level to natural ground, continuous through the building. Those walls would have substantially reduced the cross-flow ventilation available in the subfloor area. . .

"Given that the building was sprinkler-protected, it was the view of Council that the greater danger to the building was posed by inadequate subfloor ventilation (which could develop inconspicuously into a serious decay problem) rather than the risk of fire."

5.8 The Authority commissioned reports from two independent fire engineers ("engineers 1 and 2"). Those engineers were given copies of the application and of the subsequent submission mentioned above. Their reports were copied to the parties and the developer.

5.9 Engineer 1 discussed the application of clauses C3.3.2(c) and C3.3.4 of the building code and paragraph 2.3.1 of C3/AS1, and said:

"If [the designer's] application of C3/AS1 paragraph 2.3.1 is correct, their advice that the timber floor meets the requirements for a FRR of 15 minutes is not correct.

"The 15 minutes is derived from the F rating in Table B1/7 and in accordance with 3.1.1 the floor is required to achieve 15/15/15. By suggesting that a char rate of 0.6mm/min (timber) means that only 9mm of timber would be lost from the flooring only deals with the stability of the floor and not the integrity or the insulation requirements.

"Sprinklers may reduce the likelihood of fire occurring in the subfloor space, provided sprinklers have been installed in the subfloor space.

"[The designer's] report is silent on the need to install sprinklers in the subfloor space.

"Also the F rating requirement from C3/AS1 Table B1/7 is independent of sprinklers.

"Therefore, if the application of C3/AS1 paragraph 2.3.1 is correct then the floor would need to achieve a fire rating of 15/15/15. This has not been demonstrated by [the designer]. . . .

"Based on our review it is our opinion that the fire separation should extend to the natural ground level . . ."

5.10 Engineer 2's report described the building, discussed the application of clauses C3.3.2(c) and C3.3.4 of the building code, and discussed the acceptable solution in terms of the current C/AS1 rather than the previous C3/AS1. The report also discussed the use of alternative solutions. It observed that the designer had submitted, and the territorial authority had accepted, an alternative design based on assumptions of the rate of spread of fire downward through the timber floor and the control of the fire hazard in the subfloor space by a change in the body corporate rules. Engineer 2's report went on to say:

"From these facts it appears that:

"a) The construction without fire separation in the subfloor the building complied with neither the BIA fire documents nor the NZBC.

"b) The proposal to control the fire hazard in the sub-floor by a change to the body corporate rules does not meet the performance criteria set in the NZBC because, as is observed by site inspection, an owner may at any time access the sub-floor space and despite the body corporate rules to the contrary, introduce a fire risk without the knowledge and acceptance of the other owners. If a space can be used, it will be used."

5.11 The final observation was supported by the applicant, who reported that "paint tins, paper and alcohol are stored by respective owners in this sub-floor space".

5.12 The developer supported the designer's reasoning, and concluded:

"Unit titles, in hindsight, should not have shown ownership areas in the subfloor space. However, the Body Corporate rules preclude occupation or use of any of the subfloor space other than intermittent servicing. In effect, the whole space is common and it complies:

"1. by nature of the charring rate on the floor and

"2. because it is sprinklered also allows construction without fire separation between titles to comply with C3/AS1, paragraph 7.2 . . ."

5.13 The developer also submitted a report from its own consulting engineer ("the developer's consultant"), which supported the designer's reasoning and also said:

> "4 The subfloor space is already sub-divided with internal foundation walls supporting existing brick walls or walls that did support brick walls previously, but which walls will be demolished down to ground floor level in the proposed alterations. The most important requirement to be met is that the subfloor ventilation be maintained as per E2/AS1 Paras 4.1.1, 4.1.5, & 4.1.6.
>
> "5 If the air floor vents in the existing internal foundation walls were sealed to convert them to fire barriers and if the inner fire separating walls were extended down to the soil level . . . then the sub-floor ventilation would suffer. There is thus a conflict in the requirements. In our view the sub-floor ventilation requirements should take precedence over the fire safety requirements in this particular instance. The probability of moisture damage is very high, whereas the probability of a fire starting beneath the floor is very low."

5.14 The Authority then commissioned an inspection of the subfloor space by engineer 1, who made a second report, including several photographs, which was also copied to the parties and the developer.

5.15 That report said:

> "In summary
>
> "1. Existing sub floor walls need to be checked to see if they are on title boundaries.
>
> "2. It might be possible to install walls in the sub floor space but access is tight.
>
> "3. It might be possible to install sprinklers but again access is tight.
>
> "4. Rubbish needs to be cleaned out from the sub floor space.
>
> "5. There are services, electrical, drainage, water and gas, run in the sub floor space. These probably cross title boundaries."

5.16 The report repeated engineer 1's previous recommendation that "the walls on the boundary should extend down to the ground".

5.17 After considering that report, the Authority prepared a draft determination, which was sent to the parties and the developer.

5.18 Because the parties did not unanimously accept the draft, it was necessary to hold a formal hearing.

6 THE HEARING

6.1 Unit title holders other than the applicant ("the other owners") were represented by counsel at the hearing, as was the developer. The applicant and the territorial authority chose not to attend. Also present were engineers 1 and 2 as well as members of the Authority's staff, together with the witnesses called by counsel and mentioned below.

6.2 Counsel for the other owners addressed the Authority on the legal interpretation of the words "as nearly as is reasonably practicable to the same extent as if it were a new building" in the Act. What was required was a weighing exercise, and in this case the matters to be weighed against each other were the risk of fire in the subfloor area and the cost of preventing or reducing that risk. It would be established that there was in fact little or no risk of fire, and that the costs of any building work for the purpose of reducing that risk far exceeded any benefits that could be achieved.

6.3 In response to questions from the Authority, counsel explained the legal and practical difficulties involved in altering a unit title plan so as to make the subfloor space common property even if all of the owners agreed. Counsel for the developer agreed with that assessment.

6.4 Counsel for the other owners submitted a report by a third independent fire engineer ("engineer 3") incorporating comments on the draft determination and photographs of the building. Engineer 3 spoke in support of his report.

6.5 The report described the installation of fire rated walls in the subfloor space, or the extension of the sprinkler system to cover the space, as "Expensive, difficult, technically demanding and awkward."

6.6 In his report, engineer 3 evaluated three scenarios for a fire in the building. The critical scenario was for a fire in the subfloor space. That space was restricted, with only a portion of it being accessible through a small external door. Very little fuel was likely to be present, and the limited ventilation would also affect the size of any fire. The report included a computer simulation of such a fire involving a piece of furniture (a two-seater sofa or equivalent) using the program BRANZFIRE2003.

6.7 Having established the likely performance of the building in that fire, engineer 3's report also included a clause-by-clause analysis of clause C3 of the building code to demonstrate that the likely performance would satisfy each clause "as nearly as is reasonably practicable".

6.8 In response to questions, engineer 3 described in more detail the nature of the subfloor space. A sketch was prepared to show the heights of various parts of that space, and which parts were accessible (in some places with difficulty). The height of the subfloor space varied from 800 to 1100 mm in the readily accessible areas, and from 300 to 800 mm in the other areas. A comparatively small proportion of the space was accessible for storage. There was only one door to the space, on an external wall, and it was suggested that the key to that door be held by someone such as the secretary to the body corporate, to be made available only for maintenance and inspection purposes.

6.9 Counsel for the developer adopted and supported the submissions from the counsel for the other owners. He added his own submissions as to areas of evidence that had

not been available to the Authority at the time of the draft determination, and submitted statements from the designer and the developer's consultant.

6.10 The designer expanded on the sequence of events culminating in the issuing of the code compliance certificate. He corrected some misconceptions in the draft determination relating to the sequence of events and the actual construction of the building. This was a heritage building, and the sprinkler system had been installed so that the original ceiling could be retained.

6.11 The developer's consultant addressed the use of charring rates to establish fire resistance ratings, citing a number of technical references indicating that such calculations are widely accepted throughout the world. In particular, testing of particleboard by BRANZ has produced results that "agree closely with the general figure of 40 mm/h for wood".

6.12 Furthermore, that rate was observed in ISO 834 standard tests, whereas in this case the restricted air supply in the subfloor space would mean that the actual char rate would be less than 40 mm/h. Thus a calculated rating of 15/15/15 was considered by the developer's consultant to be appropriate in the circumstances.

6.13 All of the witnesses agreed and emphasised that:

(a) The restricted height, access, and air supply in the subfloor space ensured that a fire was unlikely to occur in that space, and any fire that did occur would be much less intense than that used for testing.

(b) The estimated costs of carrying inter-tenancy walls down to the ground and of extending the sprinkler system to the subfloor space were each of the order of $100,000.

7 DISCUSSION

7.1 The Authority's jurisdiction

7.1.1 Section 17 provides in effect that an application for determination must be made by a party as defined in section 16. In this case, the relevant definition is:

> (c) The owner affected

where "owner" is defined in section 2 as:

> "Owner", in relation to any land, including any buildings on that land, means the person who is for the time being entitled to the rack rent thereof or who would be so entitled if the land were let to a tenant at a rack rent . . .

7.1.2 In the case of a building held under unit titles, the Authority takes the view that the persons having the status of parties include:

(a) The body corporate in respect of the building as a whole, and

(b) Any unit title holder if that part of the building held under the title concerned is affected by the matter for determination.

On that basis, the Authority accepts that the applicant has the required status.

7.1.3 Section 18 says:

> An application to the Authority under section 17 of this Act shall be limited to whether or not, or to what extent, particular building work or proposed building work . . . complies with all of the provisions, or with . . . the building code, or to whether or not the exercise by a territorial authority of [its powers under sections 38 and 46 of the Building Act and the issuing of a certificate under section 224(f) of the Resource Management Act] is unreasonable in relation to the provisions of the building code.

7.1.4 The Authority takes the view that, in determining the extent to which the building complies with the performance-based building code, it may use the acceptable solution as a guideline or benchmark when assessing other solutions. That approach was approved by the High Court in a case also involving the change of use of a building[1].

7.1.5 The Authority also takes the view that it may use the current version of the acceptable solution, C/AS1 because a determination in terms of the current acceptable solution will be of most use to practicing fire engineers and others concerned. In this case, the relevant requirements of C/AS1 are identical to those of C3/AS1 which was current when the design was finalised.

7.2 Consultation with Authority staff

7.2.1 As mentioned in 5.3 above, the designer consulted a member of the Authority's staff about the application of paragraph 2.3.1 of C3/AS1 (now paragraph 6.15.1 of C/AS1).

[1] *Auckland CC v NZ Fire Service* 19/10/95, Gallen J, HC Wellington AP336/93, partially reported at [1996] 1 NZLR 330.

The query was illustrated by a sketch, but there was nothing to indicate that the apartments concerned were held under separate titles.

7.2.2 The staff member replied that in his opinion:

"Under the circumstances mentioned in your fax it is acceptable not to extend the fire separation to the ground.

"Please note that this is my personal opinion based on the information you have provided and offered on a no liability basis. A different decision might be reached if the matter were referred to the Authority for formal determination."

7.2.3 In fact, the designer's query did not describe the full circumstances. The Authority considers that the staff member was properly cautious in his reply so that the Authority cannot be said to have pre-judged the matter.

7.3 Title boundaries: "other property"

7.3.1 The Authority takes the view that the building code requires protection of other property, which is defined in terms of legal titles, and also requires subdivision of subfloor spaces within the same property. Both requirements must be complied with in order to comply completely with the building code.

7.3.2 There is no dispute that the legal titles to each of the ground floor apartments includes the subfloor space beneath that apartment. The amendment of the rules of the body corporate cannot alter those legal titles.

7.3.3 The floors concerned separate the rooms of the ground floor apartments from the subfloor spaces that are part of the same title. The floors do not separate the titles.

7.3.4 In terms of C/AS1, therefore, it would not be enough that the floors were accepted as having a 15/15/15 fire rating and therefore as satisfying paragraph 6.15.1, because that would not satisfy paragraph 7.2.1.

7.3.5 The Authority concludes that the building does not comply with C/AS1 and therefore does not comply completely with the building code. The question is whether it complies "as nearly as is reasonably practicable to the same extent as if it were a new building" as required by section 46 of the Act.

7.3.6 In that regard, the Authority recognises that although legal boundaries define "other property" within the subfloor space, that space could well be common property, because it is on the floors above that the effects of fire growth beyond the legal boundaries will be felt.

7.4 Compliance as nearly as is reasonably practicable

7.4.1 The requirement that a building shall comply "as nearly as is reasonably practicable to the same extent as if it were a new building" has been applied in several

determinations, and has been considered by the High Court[2], which held that the extent of what was reasonably practicable:

" . . . 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."

7.4.2 In this case, the relevant considerations are:

(a) The sacrifices, being the cost of the necessary building work, the adverse effects on subfloor ventilation, and any limitations imposed on the rights of ownership by the amendment to the rules of the body corporate; and

(b) The benefits, being the increased safety for people and property that would be achieved by increased levels of fire protection, whether by walls or by sprinklers.

7.4.3 The Authority takes the view that greater weight is to be given to considerations of life safety than to property protection. In that regard, the sprinkler system is relevant to life safety even though it does not cover the subfloor space.

7.5 Subfloor ventilation

7.5.1 Subfloor ventilation was not mentioned at the hearing, but the Authority agrees with the territorial authority about its importance. The report from the developer's consultant makes it clear that it would be difficult and expensive, if indeed it is practicable, to prevent subfloor dampness if the fire separations go down to the ground.

7.6 The rules of the body corporate

7.6.1 The amendment to the rules of the body corporate correspond to paragraph 6.15.1(b) and (c) of C/AS1. However, because the vertical fire separations do not "extend down to ground level", paragraph 6.15.1(a) is not satisfied. Nevertheless, the amended rules, if obeyed, should significantly reduce the fire risk in the subfloor space.

7.6.2 However, the applicant said that the rules were not being obeyed in that occupants are using the subfloor spaces for storage, and engineer 1's second report confirms the presence of rubbish, although it became clear at the hearing that the amount of combustible material actually present in the subfloor space was comparatively minor.

7.6.3 Storage and the presence of rubbish could be addressed administratively if the compliance schedule for the building specifically provided that in the course of the required inspections of the means of escape from fire the subfloor spaces would also be inspected to ensure that they were not being used as places of storage or places where refuse is allowed to accumulate, with any stored item or refuse already present

[2] Ibid.

to be removed. The Authority takes the view that section 18 of the Act prevents it from making a determination in respect of the compliance schedule, so that it can do no more than recommend the amendment.

7.7 Charring rates

7.7.1 The Authority accepts the evidence of the developer's consultant that charring rates are widely used to calculate the fire resistance of wood or timber elements. However, it has some reservations as to whether charring rate calculations can properly be described as having been "verified by experimental data from standard fire resistance tests" on similar composite particle board and planking floor elements. Nevertheless, the Authority accepts that, given the type of fire that might actually occur, the floor will undoubtedly provide some fire separation comparable with the 15/15/15 specified in C/AS1.

7.8 Improving fire protection in the subfloor space

7.8.1 The Authority accepts that the evidence, particularly from engineer 3, establishes that the risk from fire in the subfloor space is much less than the worst case contemplated by C/AS1. That risk would be reduced even further, if not completely eliminated, if either:

(a) The fire rated walls along title boundaries were extended down to the ground, or

(b) The sprinkler system were extended to cover the subfloor space.

7.8.2 In each case, the benefit would be an increase in the protection of a unit against fire in the subfloor space, whether originating in the subfloor space of that unit or of another unit. The increase in protection would not be great, because the risk is already low, and will be even lower if the compliance schedule is amended as recommended in 7.6.3 above.

7.8.3 In each case, the costs and inconvenience of extending the walls or the sprinkler system would represent the sacrifices, and in the case of carrying the walls down to the ground and sealing all openings and penetrations, further sacrifices would be the increased risk that subfloor dampness would damage the building structure and that parts of the space would be inaccessible even for maintenance purposes.

7.8.4 The Authority accepts from the evidence that the costs would be significant even if only those walls necessary to protect escape routes were altered.

7.8.5 The benefits of extending the walls or the sprinkler system would be to reduce the already low risk that a fire would start in the unsprinklered subfloor space and spread upwards through the floor. The Authority does not consider it necessary to take account of a fire starting in a sprinklered apartment and spreading downwards through the floor.

7.8.6 The Authority considers on the evidence that the risk is low. Therefore the benefits of reducing that risk are also low, whereas the associated sacrifices are considerable.

7.9 Conclusion

7.9.1 The Authority therefore considers that the sacrifices involved in making further alterations outweigh the resulting benefits. The Authority accordingly concludes that building as constructed complies as nearly as is reasonably practicable with the provision of the building code.

8 THE AUTHORITY'S DECISION

8.1 In accordance with section 20 of the Act, the Authority hereby determines that:

(a) The building as altered complies as nearly as is reasonably practicable with the provisions of the building code for means of escape from fire and for protection of other property as required by section 46 of the Act.

(b) The territorial authority's decision to issue the code compliance certificate is accordingly confirmed.

8.2 As mentioned in 7.6.3 above, the Authority recommends that the compliance schedule for the building be amended to specify that in the course of the required inspections of the means of escape from fire the subfloor spaces shall also be inspected to ensure that they were not being used as places of storage or places where refuse is allowed to accumulate, with any refuse or stored items found to be present to be removed.

Signed for and on behalf of the Building Industry Authority on this 18th day of June 2004

John Ryan
Chief Executive