A PARTIAL COMMENTARY ON THE NATIONAL BUILDING CODE

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FOREWORD

We had attempted to keep the language and style of the recently completed National Building Code reasonably simple. However we had to remain conscious of the fact that the Code will be called up in legislation as the primary document for building control. This placed some constraints on the language that we could use. A need has therefore arisen for an explanation of the complex provisions of the Code. The Commentary is aimed at satisfying this need to a large extent. The Commentary does not cover the Performance Requirements. These requirements have been couched in terms which would allow suitable flexibility. Any attempt at commenting on any of the Performance Requirements is likely to limit their generality. The Commentary therefore covers only the more difficult clauses of the Deemed-to-Satisfy provisions of the Code.

The time that was available to us to work on the Commentary was unrealistically short. Therefore only those clauses have been commented upon which in our view are the more difficult to understand. We have used plenty of diagrams to illustrate the various situations covered by these clauses.

The Commentary is just a set of comments on the provisions of the Code. The diagrams used are only illustrative examples and not definitive solutions to cover all circumstances. The Code alone is the authoritative document for the purposes of building control. Inspite of these limitations the Commentary should help users to find their way through the Code.

When working on the Commentary we noticed some errors in the Code. We have shown these errors and corrections in an Appendix to the Commentary so that it will help Code Administrators to issue formal advise of the corrections.

We have used several of the diagrams employed in the commentary on the Building Code of Australia as a guide to produce our diagrams. We are very thankful for this to the Australian Uniform Building Regulations Co-ordinating Council (AUBRCC) and the staff at the Division of Building, Construction and Engineering of the CSIRO, Australia. In particular I thank Hugh Knox, Manager, Regulations, Accreditations and Standards at the National Building Technology Centre, Sydney who has helped me through our discussions on several of the topics covered. Vishwa Goundar an artist in Suva, Fiji produced the diagrams for the Commentary. He has also produced the cover design. I thank him for his contribution. I am thankful to the Project staff, especially to Sashi Lata Pal, for their dedication in completing the Commentary in a very short time.

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Suva : December 1990

SECTION A GENERAL PROVISIONS

PART A1 INTERPRETATION

A1.1 Definitions

The definitions given in the Code are intended to give very specific meanings to the words and phrases used in the Code. Such meanings could be different from dictionary meanings and meanings in the Australian, New Zealand and other Standards called up in the Code. However for the purpose of the Code the defined meanings will have priority over all other meanings.

Charged Dry Riser Main System : Dry risers were traditionally left unfilled except when used for fire fighting. Keeping the dry *riser main* charged will accomplish the following:

(i) When the firemen attend to a fire in the building they can be confident that none of the valves in the system had been left open. With the system charged permanently any open valve will leak and alert the building maintenance staff.

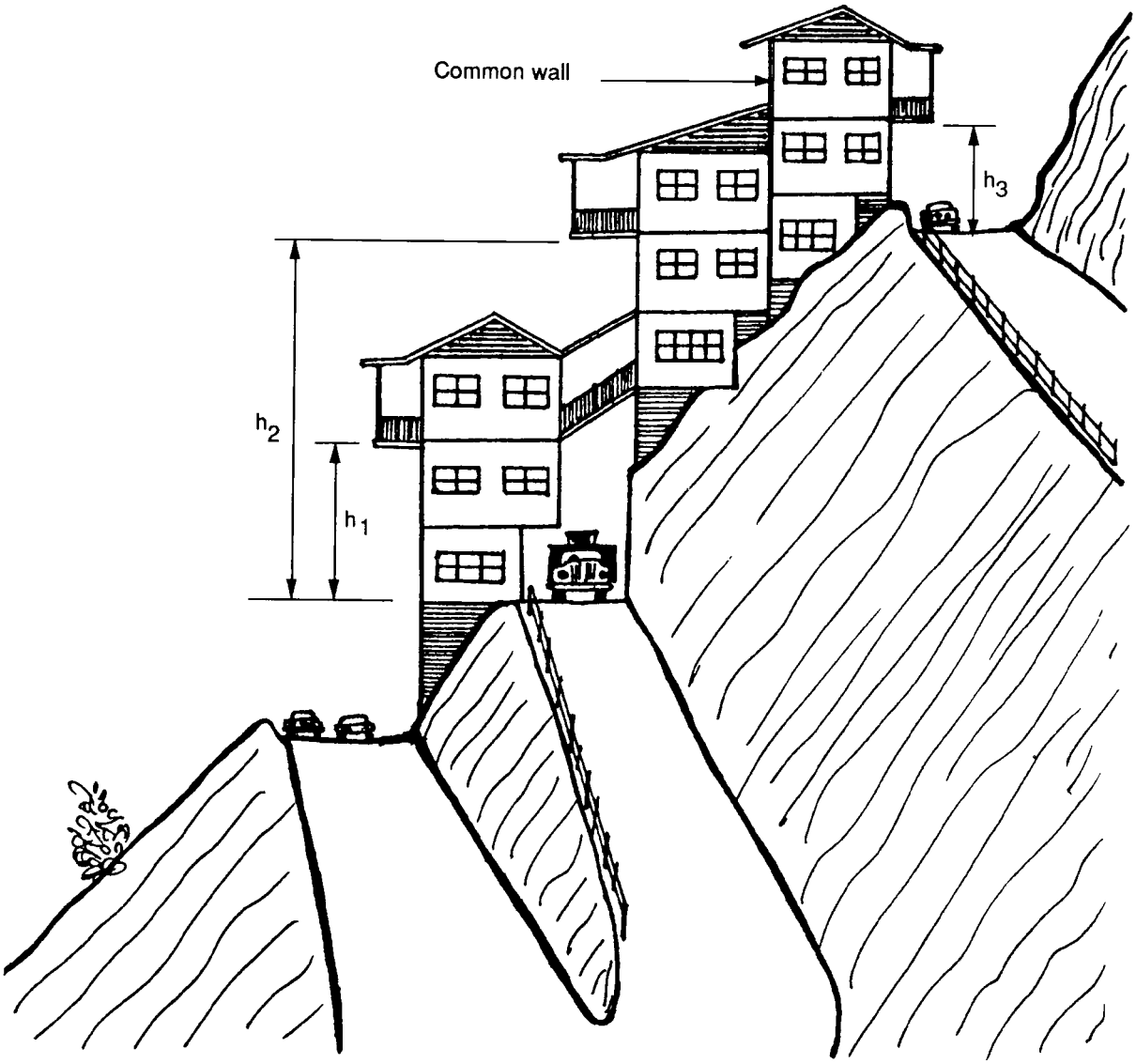
(ii) The greater confidence of the fire fighters and the quicker response of the system will cut the time lost during the initial crucial period of fighting the fire.

Combustible : All materials are *combustible* under appropriate conditions. For the purpose of the Code a material is deemed to be *combustible* if it fails to pass the requirements of AS 1530.1.

Effective Height : The *effective height* is an important measure in terms of the reach of fire fighting equipment. The safer practice will be to consider *effective height* from the lowest entrance level of a building by the side of which it is possible to station a fire engine. The definition however asks to measure *effective height* from the highest *storey* providing egress to a road or *open space*. The marginal reduction in safety is compensated by reduced cost. Measurement of *effective height* is illustrated in Sketch A1.1(i).

When there are a series of buildings which are connected together by passageways and/or *common walls* such as on a sloping ground so that the whole complex forms a single building for the purpose of the Code, it will be inappropriate to measure *effective height* for the whole building from the highest *storey* with egress to a road or *open space*. In such a case the *effective height* of each segment of the building is determined as if it were a separate building and the maximum value of the *effective height* of the different segments treated as the *effective height* for the whole building. This is illustrated in Sketch A1.1(ii).

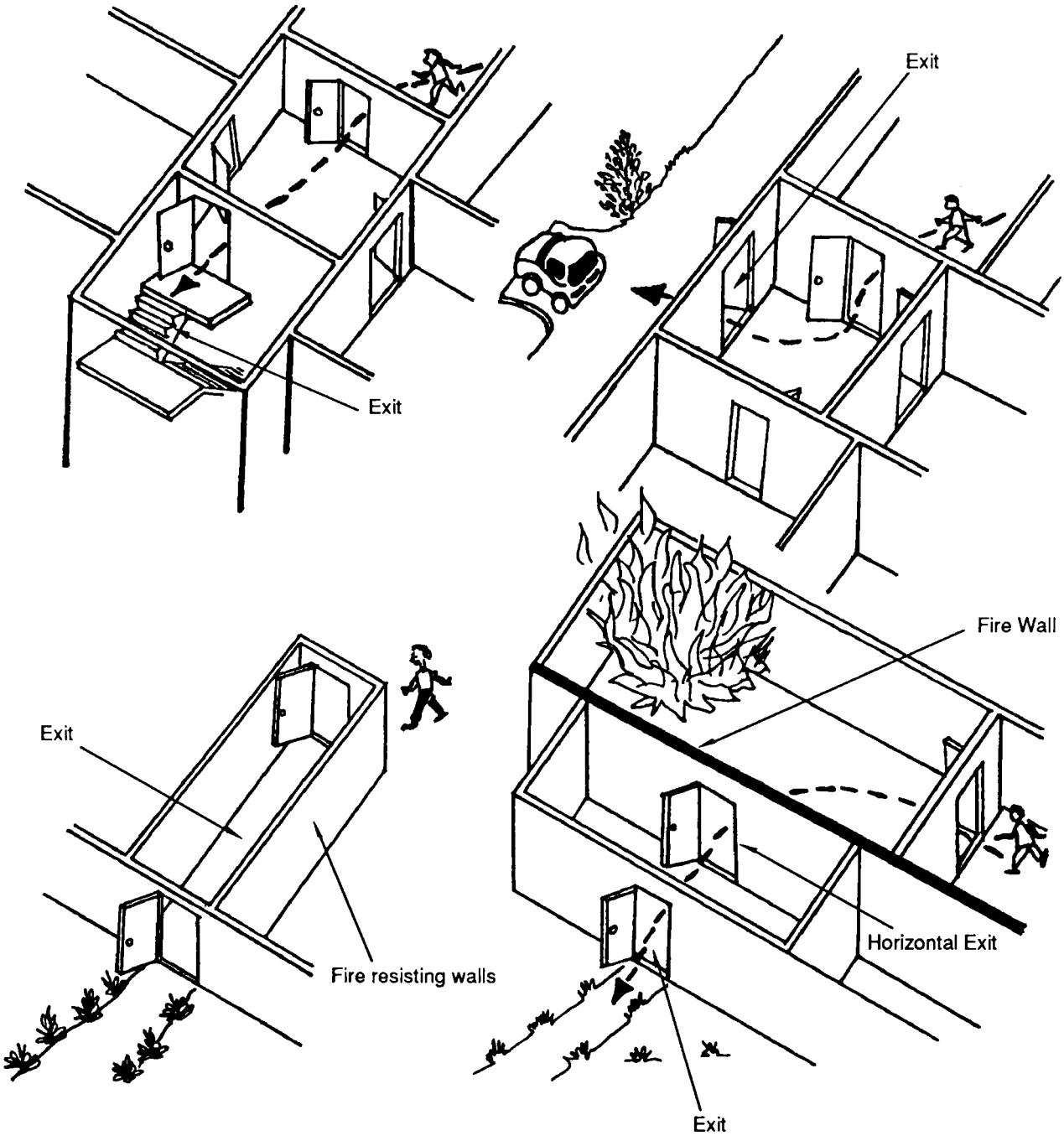
Sketch A1.1(i) Measurement of Effective Height



Effective height is the maximum of h_1, h_2 and h_3

Sketch A1.1(ii) Measurement of Effective Height of Stepped or Terraced Buildings

Exit : *Exits* as defined in the Code have the specific purpose of allowing a fast and safe egress in case of any emergency. The term has a range of meanings. A doorway for instance is an *exit* only when it directly opens to a roadway or *open space* unless it is a *horizontal exit.* Some of the different types of *exit* given in the definition are illustrated in Figure A1.1(iii).



Sketch A1.1(iii) Examples of Exits

Fire Compartment: Parts of a building can be separated from other parts by construction which will prevent the passage of fire and smoke from one part to another. Each such part is then known as a *fire compartment*. There is no requirement in the definition that a *fire compartment* should be protected from the spread of fire and smoke from other adjoining buildings. However there are other requirements in the Code which provide for this suitably.

The fire load in a compartment is generally proportional to its *floor area*/volume. Therefore limiting the *floor area*/volume of a *fire compartment* limits the severity and duration of a fire originating in it. Compartmentation protects the occupants from any fire outside the compartment. It also prevents the spread of fire from any compartment where it originated.

Where the fire service is not adequately equipped and manned or where sprinklers are not commonly used or where other such active means of fire protection are of limited availability, limiting the *floor area*/volume of *fire compartments* is an effective means of securing safety against fire.

Fire-resistance Level: The fire-resistance of any building element is expressed in terms of three criteria. These are:

Structural Adequacy - the element must have sufficient structural strength to continue to bear the loads for which it is designed for a sufficient time after it has been affected by fire.

Integrity - it must be capable of withstanding the effects of the fire for a sufficient time without changing shape or warping or undergoing any cracking, any of which might allow flames and smoke to pass through the element.

Insulation - it must be capable of limiting any rise in temperature from the fire side to the safe side to a prescribed value.

These are all determined by the standard fire resistance test in accordance with AS 1530.4 The results are expressed in minutes of duration over which the building element is capable of fulfilling the criteria. These are always expressed in the order of *structural adequacy* followed by *integrity* and then by the time for which it has sustained its insulating capability. Usually the times are expressed in multiples of 30 minutes.

An example of the *fire-resistance level* (FRL) of a wall is 90/60/30 which means that it will continue to bear the load for a period of 90 minutes after a fire of severity equivalent to the test fire, to be free from producing any cracking or warping for a period of 60 minutes and prevent any rise in temperature on the non-fire side by more than a prescribed level, for 30 minutes. If the wall is non-*loadbearing* and is only a *fire resisting* partition the very first figure in the value of the FRL would show a blank. In the example taken it would be -/60/30. In the case of a column the FRL will be relevant only for *structural adequacy*. The column by itself cannot prevent the passage of any smoke or flames nor can it prevent any rise in temperature around it. Therefore an example for a column would be 60/-/-. In the case of a fire door it will have no *loadbearing* capability and therefore its FRL will be expressed with the first value shown as a blank. An example would be -/60/30. If the door in this example is incapable of limiting the rise in temperature from one side to the other its FRL would be -/60/-.

Fire-source Feature: This is equivalent to an imaginary burning building. The Code allows buildings to be erected up to the allotment boundary, provided the stated requirements are fulfilled. If such a building were to catch fire it could endanger buildings in the neighbouring allotment through tongues of flame, flying brand, convection and radiant heat. Therefore the definition uses the appropriate land boundaries and the *external walls* of buildings within the allotment as *fire-source features*. The *external walls* of a Class 10 building is not considered to constitute any material danger.

Flammability Index: This is determined on the basis of AS 1530.2. It is a composite index that consists of

(a) the speed with which the material will catch fire,

(b) the heat produced as a result of burning and

(c) the extent to which the burning will spread within a given time.

The higher the *flammability index* the more the risk. The values range from 0 to 100.

The test is suitable only for sheet and woven materials which are reasonably pliable such as carpets and wall coverings and which do not readily melt or shrink away from an igniting flame.

Horizontal Exit: This has already been illustrated while commenting on *exit* . It must be remembered that a *horizontal exit* is not any door but one which is located in a *fire wall* that is *required* under the Code.

Non-combustible : This definition has been given separately for materials and for parts of a building or a construction.

In the case of any material it should not be *combustible* as explained in the definition of that term. However it can have thin finishes such as paint or wall paper with a thickness of no more than 1 mm. The *spread-of-flame index* should not exceed zero (see commentary on *spread-of-flame Index*). When the term is applied to construction or a part of a building, the construction or part must have *non-combustible* material on all exposed faces. The definition further gives a list of specific materials which are considered to be *non-combustible*.

Professional Consultant: The definition clearly specifies that the consultant must have appropriate experience in the relevant field. The consultant must either be registered under some existing legislation or must be a full member of a recognised Professional Institution or Association.

Site: The definition as given might give the impression that it is only that part of an allotment covered by the outline of the building. Such was not the intention when the term was defined. The term also includes the land in the vicinity of the building which is required to carry out its erection, continued use and demolition. There was