BRITISH STANDARD CODE OF PRACTICE
CP 3: CHAPTER IV : Part 1 : 1971

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CODE OF BASIC DATA FOR THE DESIGN OF BUILDINGS

CHAPTER IV
PRECAUTIONS AGAINST FIRE

Part 1. Flats and maisonettes (in blocks over two storeys)

THE COUNCIL FOR CODES OF PRACTICE
BRITISH STANDARDS INSTITUTION

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Incorporating amendments issued January 1972 (AMD 651), January 1973 (AMD 1077), February 1976 (AMD 1869) and August 1978 (AMD 2708)

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PRECAUTIONS AGAINST FIRE

PART 1. FLATS AND MAISONETTES (IN BLOCKS OVER TWO (STOREYS)

This part of the Code of Practice has been prepared by a Committee convened by the Codes of Practice Committee for Building. Having been endorsed by the Council for Codes of Practice, it was published under the authority of the Executive Board on 29th October, 1971.

SBN: 580 06886 2

This Code of Practice makes reference to the following British Standards:

BS 336.	Fire hose couplings and ancillary equipment.
BS 476.	Fire tests on building materials and structures.
BS 799.	Oil burning equipment.
BS 1227.	Hinges.
	Part 1A. Hinges for general building purposes.
BS 2655.	Lifts, escalators, passenger conveyors and paternosters.
	Part 1. General requirements for electric, hydraulic and hand-powered lifts.
BS 3300.	Kerosine (paraffin) unflued spaceheaters, cooking and boiling appliances for domestic use.
BS 3980.	Boxes for foam inlets and dry risers.
BS 4422.	Glossary of terms associated with fire.
	Part 1. The phenomenon of fire.
CP 3.	Code of basic design data for the design of buildings.
	Chapter IV. Precautions against fire.
	Part 2. Shops and departmental stores.
	Part 3. Office buildings.
CP 153.	Windows and rooflights
	Part 4. Fire hazards associated with glazing in buildings.
CP 306.	The storage and collection of refuse from residential buildings.
CP 331.	Installation of pipes and meters for town gas.
	Part 2. Metering and meter control.
CP 332.	Selection and installation of town gas space heating.
	Part 1. Independent domestic appliances.
	Part 2. Central heating boilers for domestic premises.
	Part 3. Boilers of more than 150 000 Btu/h (44 kW) and up to 2 000 000 Btu/h (586 kW) output.
	Part 4. Ducted warm air systems.
CP 407.101.	Electric lifts for passengers, goods and service.
CP 3002.	Oil firing.
CP	Suspended ceilings and linings of dry construction using metal fixing systems (in course of preparation).

British Standard Codes of Practice are revised, when necessary by the issue either of amendment slips or of revised editions. It is important that users ascertain that they are in possession of the latest amendments or editions.

The following BSI references relate to the work on this Code of Practice:
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PRECAUTIONS AGAINST FIRE

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* Resigned, April, 1971
† Resigned, December, 1970

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This Code of Practice represents a standard of good practice and takes the form of recommendations: compliance with it does not confer immunity from relevant legal requirements including regulations and byelaws.

BRITISH STANDARD CODE OF PRACTICE CP 3

CHAPTER IV

PRECAUTIONS AGAINST FIRE

Part 1. Flats and maisonettes (in blocks over two storeys)

FOREWORD

The object of this Code is to provide that in the planning of new flats and maisonettes in blocks over two storeys in height, adequate safeguards are introduced to protect the lives of occupants in the event of fire. The difficulty of making comprehensive recommendations capable of covering every possible risk should be appreciated and an intelligent application of the principles and the recommendations which follow is therefore essential.

This Code supersedes CP 3, ' Code of basic data for the design of buildings ', Chapter IV, ' Precautions against fire ', Part 1, ' Fire precautions in flats and maisonettes over 80 ft in height '.

It has become apparent, and generally agreed, that external rescue by the Fire Service may not always be possible from blocks of flats and maisonettes, even when the dwellings are within reach of escape ladders. Modem traffic conditions and congestion, as well as parking around blocks, may delay the attendance of the fire brigade; furthermore, reliance on such appliances as manipulative types of escapes or mobile ladders is considered to be unsatisfactory. Also, the assumption should no longer be made that entire buildings, whole floors, or even adjoining dwellings need to be evacuated if a fire occurs. Owing to the high degree of compartmentation provided in dwellings in modem blocks, the spread of fire and smoke from one dwelling to another and the need to evacuate the occupants of adjoining dwellings are unusual. The occupants should be safe if they remain where they are. Nevertheless, the possibility that individuals may seek to leave the building cannot be overlooked and provision should therefore be made for the occupant of any dwelling to do so by his own unaided efforts, using adequately protected escape routes within the building without outside assistance.

Once the principle of rescue by the fire brigade is discounted, it becomes apparent that there is no reason for a substantially different Code of Practice applying to buildings below 24 m (approximately 80 ft) in height, compared with those above 24 m (approximately 80 ft) in height; hence the publication of this ' combined ' Code of Practice, which it is intended will apply to all flats and maisonettes above the first floor in blocks of any height. (One and two storey dwellings entered at ground level from outside a block, that is, not through a main stairway or shared circulation space, are excluded.) One problem in drafting tbis Code has been the widely varying requirements that have been applied to buildings of different heights in the past. The committee has therefore attempted to achieve a balance between those many standards, bearing in mind the latest developments in methods of achieving life safety.

The committee has taken a positive view in the new Code. It is seen as a step forward in providing for life safety by presenting under one cover a Code for all flats and maisonettes. The Code is presented as a companion volume to Part 2, ' Shops and departmental stores ', and Part 3, ' Office buildings ', recently published, and its appearance at this time has provided a valuable opportunity to incorporate some new ideas. A choice is now available to the designer of flats and maisonettes as to the system he may adopt for the protection of escape routes. The choice is based on the principles of smoke control and smoke dispersal, either by natural cross ventilation or by mechanical means. This should allow greater design flexibility and, if smoke dispersal is adopted, increased travel distances compared with those previously recommended in CP 3 : Chapter IV : Part 1. (In certain cases the use of a combination of permanent and openable ventilation, or automatically controlled ventilators, is also recommended.)

Because of the wide variety of block types to which the Code will be applicable, the aim has been to make the recommendations as straightforward as possible and to discuss the principles in detail so that designers, local authorities and fire authorities will be able to apply the Code with some flexibility in unusual conditions.

The section dealing with construction is very brief. The various building regulations are comprehensive in their cover of structural fire precautions as they affect housing and very little has needed to be added to their provisions. Indeed, it has been considered advisable not to complicate the situation by causing any more reference than is necessary to two separate documents on the subject of structural fire precautions.

The Figures are intended only to clarify points made in the text. It should not be assumed that these plans are more satisfactory than others which may be devised.

The additional precautions necessary where dwellings are combined with, or are adjacent to, other occupancies such as shops, offices, large storage areas or car parks under buildings have not been fully considered. It is of course essential that there should be adequate physical separation between the two occupancies and that the means of escape from the dwellings should be designed and constructed so that under no circumstances can they be attacked by fire or smoke from the other occupancy. Consideration should also be given to the siting of blocks of dwellings in relation to other buildings and risks to ensure that the escape routes will not be endangered by a fire in an adjoining building. Advice on these points, as on other matters not covered in this and its companion Codes, can be obtained ftom the Building Regulation Authority and the Fire Authority, who will also advise on the practical application of the recommendations contained in this Code.

The guiding principle in the recommendations which follow is safety of life. In aiming to secure this, the Code should be applied as a whole. The most conscientious application of the ' Principles ' and ' Recommendations ' would be completely or partially undermined if it were not supported by the necessary measures relating to construction, ancillary accommodation, engineering services, etc., recommended in the subsequent sections.

Attention is drawn to the difference between the application of the recommendations in this Code and the obligations, as regards means of escape, imposed by legislation under the Scottish Building Regulation Standards and the London Building Acts and other local building enactments. Compliance with this Code (which is only concerned with the design of new buildings) may not necessarily secure approval for purposes of life safety under the above legislation; consultation should always take place with the enforcement authority at an early stage. Fire and water authorities should also be consulted at an early stage.

As added Aug. 1978

The advice to owners and occupiers of flats given in 8.2, as amended by Amendment No. 4, was originally published as Appendix B of the 'Report of the Working Group of Fire Safety in High Rise Blocks of Flats' of the Central Fire Brigades Advisory Councils for England and Wales and for Scotland. It was inserted in this Code following discussion in Parliament (Hansard, 8 March 1977, 453) when it was stated that the form of advice to occupants in BS CP 3 should be replaced by advice which the working group set out.

1. GENERAL

1.1 SCOPE

This Code deals with the planning of blocks of flats and maisonettes and of individual dwellings above the first floor in blocks of any height, and makes detailed design recommendations. One and two storey dwellings entered at ground level from outside any block (that is, not through any main staircase or shared circulation space) are not included.

In this Code, Section 2, 'Planning: General principles', is to be read in conjunction with Section 3, 'Planning: Recommendations', for the design of flats and maisonettes; when applying the latter, account should be taken of relevant additional factors and qualifying remarks made under the former.

NOTE. The titles of the British Standards referred to in this Code of Practice are listed on page 2.

1.2 DEFINITIONS

For the purposes of this Code the following definitions apply:

Adjoining dwelling	A dwelling either adjacent to or actually adjoining a dwelling in which fire is assumed to have originated (see 'dwelling of origin' below).
Alternative exit	One of two or more exits from within a dwelling, each of which is separate from the other.
Alternative escape route	One of two escape routes from a dwelling each of which is separate from the other (usually a Stage II* condition).
Balcony access; Balcony approach	A design in which each dwelling is approached externally via an open balcony (which may in certain cases include a subsidiary stairway; see also 'deck access' below).
Corridor access; Corridor approach	A design in which each dwelling is approached via a common horizontal internal access or circulation space which may include a common entrance hall.
Dead end	An area from which escape is possible in one direction only.
Deck access; Deck approach	Similar to balcony access; a term often used to indicate a wide approach balcony which is sometimes roofed over but not enclosed (see also 'balcony access' above).
Dwelling	A self-contained flat or maisonette.
Dwelling of origin	A dwelling in which a fire has originated (see 'adjoining dwelling' above).
Emergency lighting	Lighting, from a separate source independent of the mains supply, which continues after failure of the normal lighting of a premises.
Entrance hall	Unless described as a common entrance hall, a protected hall or space within a dwelling into which the entrance and other doors open.
Escape route	A route forming part of the complete means of escape within a dwelling and a building, via a series of fire resisting, self-closing doors, to a place of safety.
Final exit	The terminal point of an escape route from a building beyond which persons are no longer in danger from fire or smoke.
Fire resistance	A property of an element of structure as defined in BS 4422, Part 1.
Fire resisting doors (types 1 to 4)	Doors with varying fire resistance, frame design and/or ironmongery, as described in 4.3.
Flat	A dwelling, forming part of a larger block with common access, which has all its *habitable rooms and kitchen* on one level or, in the case of 'split level' flats, not more than half a storey height apart.
Landing	A circulation space, generally inside a dwelling, at the head, foot, or intermediate stage of a stairway, off which rooms may be entered.

* See 2.1.1.3

Linking balcony	An arrangement which provides alternative access in an emergency to an adjoining place of safety via an external balcony, usually between two dwellings.
Lobby	Unless described as a 'stairway protection lobby' (q.v.), a similar function and meaning to 'corridor' except that 'lobby', by common usage, refers to a smaller space of compact shape.
Maisonette	A dwelling, forming part of a larger block with common access, which has its habitable rooms and kitchen divided between two or more levels which are more than half a storey height apart.
Means of escape	Structural means whereby a safe route, or routes, is provided for persons to travel from any part of a building to a place of safety by their own unaided efforts.
Non-combustible	A property of a building material as defined in BS 4422, Part 1.
Place of safety	A place in which persons are in no danger from fire.
Protected circuit	An electrical sub- or main circuit, protected against fire and exclusively serving fire lifts and stairway or corridor lights.
Self-closing, fire resisting door	A fire resisting door fitted with a device which fully closes the door overriding the resistance of any latch.
Stairway, main	A common stairway which forms part of a vertical escape route finally leading to the outside of a building at podium or ground level.
Stairway, protected	A stairway protected from the remainder of a building by fire resisting construction, accessible only through self-closing, fire resisting doors and forming the vertical component of a protected escape route.
Stairway protection lobby	A lobby which is provided to give protection to a stairway from the entry of smoke and gases from a fire at that level and which has either permanent or openable ventilators or windows.
Stairway, single	A main stairway which is the only one to which dwellings in a block of flats or maisonettes have access.
Stairway, subsidiary	A stairway, not a main stairway, which serves a number of dwellings off a horizontal access route and which may be regarded as an extension of that route and which does not discharge outside the building at podium or ground level.

2. PLANNING: GENERAL PRINCIPLES

NOTE 1. This section should be read in conjunction with Section 3; the numbers of corresponding clauses are shown in square brackets.

NOTE 2. Figures are intended only to clarify points made in the text; it should not be assumed that these plans are more satisfactory than others which may be devised.

2.1 GENERAL

It is no longer assumed that when a fire occurs in a block it is necessary to evacuate the whole block, whole floors or even dwellings adjacent to the fire. In an emergency, however, the occupants of dwellings would generally first try to escape from a fire by the most obvious route in order to reach safety before being cut off by smoke and hot gases. Where escape routes are adequately protected, safety may be reached within the building, or in the open air clear of the building, by the occupants' own unaided efforts and without reliance on rescue by the fire service.

2.1.1 Analysis of the problem

2.1.1.1 The only sound basis for designing means of escape from fire is to attempt to locate the position of all possible sources of any outbreak of fire and to predict the courses which might thereafter be followed by the

fire as it develops or, more particularly, the routes which smoke and hot gases are likely to take. Only against this background is it possible to design and protect escape routes with some certainty that they will be safe.

2.1.1.2 The approach described in **2.1.1.1** is fundamental. This Code makes recommendations in terms of the number of exits, travel distance, protection of escape routes, etc., and it may, by the way in which these recommendations are drafted, provide some guidance on design principles, but it is impossible to make specific recommendations showing how to avoid, or minimize, all possible risks. An intelligent use of the recommendations is essential, but this is possible only if an attempt is made to identify the likely points of origin of fire and to anticipate its subsequent behaviour.

2.1.1.3 For the purposes of this Code escape routes are considered in three stages: in Stage I, the risk is to the occupants of the dwelling in which the fire originates; in Stage II, the risk is to the occupants of adjoining dwellings if smoke or fire should penetrate to the horizontal escape route (the common corridor, or balcony or approach to a subsidiary stairway); in Stage III, the risk is mainly to the occupants of dwellings on floors above the floor of outbreak if smoke or hot gases should penetrate to the vertical escape route (the common stairway) or to the horizontal escape route from the foot of the stairway to the open air.

2.1.1.4 It should be emphasized that although the recommendations of this Code do not apply to ground and first floors, no variation of these floors, compared with those above, should be permitted which would in any way reduce the safety of the occupants of the upper floors. This would not affect the requirements of Stage I but, in Stage II and, particularly, in Stage III, protection afforded to the stairway should not be reduced on the lower floors.

2.2 STAGE I

2.2.1 General

2.2.1.1 Most serious accidents and fatalities occur in rooms in which a fire originates.

2.2.1.2 Fires occurring in kitchens or living rooms (particularly when unoccupied) are a major threat to safety as they may develop to serious proportions whilst occupants are asleep in their bedrooms. This is a much greater risk in maisonettes than it is in most flats, because smoke and hot gases rise more rapidly than they spread horizontally; but the risk is not a negligible one in flats, even where all the bedrooms open out of the entrance hall; where the bedrooms are entered through the living room (as in the case of bed-sitting rooms) the risk is at least as great as it is in maisonettes.

2.2.1.3 The incidence of fires in bedrooms has increased in number during recent years. Fires have developed in unoccupied rooms to an extent which has seriously affected the means of escape in Stage I before discovery and the influence of new social habits such as television viewing (during which fires may spread rapidly before detection) add to this tendency. Recommendations are made in this Code to reduce such risks.

2.2.1.4 A fire occurring in the entrance hall or circulation space of a dwelling will be a most serious hazard if the plan is such that the only escape route from any part of the dwelling passes through it and the use therein of kerosine (paraffin) and other unfixed heaters should be strongly discouraged because of the risks they may create.

2.2.1.5 In the recommendations which follow, the acceptance of a flat having only one exit is based on the assumption that there is a protected escape route within it and that there is no appreciable fire risk in the entrance hall or circulation space. If these assumptions are not made it would be necessary for every flat to have an alternative exit from every room.

2.2.1.6 As a measure of protection in Stage II it is recommended that the entrance door of a dwelling should be self-closing and fire resisting (see **2,3.4.1**). If such a door is also fitted with a self-locking latch there will be some risk that the door will accidentally become locked during a fire while one of the occupants is raising the alarm outside the dwelling. On the other hand, a deadlock operated only by a key could also be unsatisfactory

because of the risk that the key might be missing when wanted in an emergency. It is preferable, therefore, that these doors should be fitted with a lock which can be opened by a handle from either side, and which can only be locked on the outside by a key and on the inside by a manually operated bolt. Locks of this type are now generally available.

2.2.2 Flats

2.2.2.1 Two methods of providing safety are possible. One is to ensure that the escape route from any bedroom or living room to the entrance door of the flat will be via a protected entrance hall or lobby unlikely to be cut off by smoke. The other is to provide an alternative exit from the corridor or bedrooms, though the entrance hall is still required to provide protection to the Stage II escape route. [3.2.1]

2.2.2.2 To protect occupants from smoke and hot gases from a fire within a flat, and to minimize the amount of smoke which might spread to a Stage II escape route, the walls of the entrance hall, lobby or circulation space within a flat should have a prescribed minimum standard of fire resistance. All rooms (other than bathrooms and w.c.'s containing no fire risk) opening off the hall, lobby or circulation space should be fitted with self-closing, fire resisting doors (cupboard doors need not be self-closing). The hall, lobby or circulation space should not contain any likely source of fire. [3.2.1.1]

2.2.2.3 If reliance is to be placed on escape via the entrance hall or circulation space, all bedroom and living room doors should open out of the hall and bedroom doors should preferably be nearer to the exit door from the flat (i.e. the normal entrance door) than are the doors of kitchen and living rooms (see Fig. 1). The travel distance from the door of any bedroom to the entrance door (or, where the flat is entered from the floor below, to the head of the private stairway) should be limited (see Figs. 2 and 4). [3.2.1.1] [3.2.2.2]

2.2.2.4 Where the arrangement of the living rooms and bedrooms does not comply with the recommendations given in 2.2.2.2, or where the entrance to the flat is via a private internal stairway from a floor above, an alternative exit should be provided (see Figs. 2, 3 and 5). [3.2.2.2]

2.2.3 Maisonettes

2.2.3.1 Many arrangements of maisonette are possible. Designs vary from the most common type which is approached from a common open balcony or deck, with living rooms at entrance level and bedrooms directly over on the floor above, to complex cross-over interlocking forms extending through two or more floors with living rooms, kitchens and bedrooms on any floor (see Figs. 6, 7A to 7E).

2.2.3.2 Because of the generally greater hazard in a maisonette compared with that in a flat it is essential to provide:

(1) a private entrance hall and (except in certain ' open plan ' maisonettes) a stairway therein, with no fire risk; living rooms and bedrooms should have direct access to the hall or a landing without passing through another room;

(2) an alternative exit (or exits) from any floor with habitable rooms other than the entrance floor;

(3) protection of internal escape routes against fire and smoke.* [3.2.3]

2.2.3.3 All entrance halls and, except where each bedroom on a level above the entrance floor is provided with an alternative exit (see Fig. 7A(i)), all landings should be protected from the effects of fire and hot gases. The enclosing walls of entrance halls, landings and circulation spaces should have a prescribed minimum standard of fire resistance and all doors opening on to these circulation areas (except those of bathrooms and w.c.'s with no fire risks) should be self-closing and fire resisting (see Figs. 7A to 7D). Cupboard doors need not be self-closing but should be kept shut. [3.2.3]

2.2.3.4 To reduce the risk to occupants on any upper floor within a maisonette, floors on which habitable rooms are located should be separated from each other by fire resisting screens and doors at the head or foot of a stairway and/or intermediate landing, except:

* Advice will shortly be available on the location and use of warm air heating units.

(1) where bedrooms are not located at entrance level, where they are provided with more than one alternative exit and where the need to cross the landing has been eliminated either by the use of pass-doors between bedrooms or by bedroom doors being within a limited travel distance of each other (see Figs. 7A(i), 7A(iii), 7B(i) and 7B(iii)); or

(2) where bedrooms are at entrance level and the living room and kitchen are on the floor above (see Fig. 7C(i)); or

(3) where each bedroom has its own independent alternative exit (see Figs. 7A(i) and 7E). [3.2.3]

2.2.3.5 There are various acceptable ways of providing alternative exits. One method is the provision of a balcony which leads to a place of safety (see Fig. 17). Another method is to provide a private stairway leading up or down to a main corridor or public access area on another floor from which safe escape may be made (see Fig. 6). Such a stairway will, however, penetrate a main floor, thus introducing a risk that fire might spread from one floor to another. It is particularly important that the stairway should be adequately protected against such a risk. The risk is much reduced if the stairway leads downwards rather than upwards. In both cases it remains necessary to assure safety in Stage II. [3.2.3]

2.2.3.6 Open planning arrangements are in certain cases acceptable. Special consideration should be given to the merits of each particular design and to the foregoing principles (see Fig. 7E). [3.2.3.4]

2.3 STAGE II

2.3.1 General. This stage is concerned with the safety of occupants using the horizontal escape routes, i.e. those which lead from the exit of an individual dwelling to a main stairway. The aim should be to ensure that a fire which starts in any one dwelling will not obstruct the escape of the occupants of any other dwelling on the same, or adjoining, floor. Since the normal escape route is identical with the approach route, the problem is related to the three types of approach, namely, by an external balcony or deck, by a subsidiary stairway leading from an external balcony or deck and by an internal corridor.

2.3.2 Dwellings with balcony or deck approach. Although there is little risk with this type of approach that fire will spread from one dwelling to another dwelling which adjoins it or that smoke from a fire will cover more than a short length of the balcony, there is some risk that the part of the balcony which adjoins a dwelling which is on fire may at some time become impassable due to flames, smoke or hot gases issuing from a door or window opening. In order to reduce these risks, where the escape route from any dwelling leads in one direction only to a main stairway, a specified height of external wall of any dwelling abutting the balcony should be constructed to a prescribed minimum of fire resistance so that persons may be able to crawl past the dwelling on fire with some measure of protection; the travel distance should also be limited to that required by the fire service for fire-fighting access (see Fig. 9; also see 7.1.4 and 7.3.1). If escape is possible in two directions (Figs. 8 and 10), the risk that both will be rendered impassable by smoke will be negligible and travel distance should be restricted only by the requirements of the fire service for fire fighting access and special protection of external walls will be unnecessary. Where these recommendations are not adopted, an alternative escape route from each dwelling should be provided independent of the common balcony. [3,3.1]

2.3.3 Dwellings with entrance doors opening indirectly off a balcony or deck via a subsidiary stairway. It is important to appreciate the distinction between subsidiary and main stairways. A main stairway provides a vertical escape route to the ground or to the base of a block at podium level; a subsidiary stairway, on the other hand, serves only as an access to a limited number of dwellings entered from a floor above or below a balcony or deck to which it is regarded as an extension. To prevent the subsidiary stairway becoming smoke-logged it should be permanently ventilated at the head and should not be enclosed at balcony or deck level by a door. Weather protection should be provided to prevent ice forming and snow falling on to the stairway. No dwelling should have access to the subsidiary stairway at balcony or deck level. [3.3,2]

Restrictions imposed on the horizontal escape route between the subsidiary stairway and the door to a common stairway should be the same as those relating to balcony-approach dwellings (see 2.3.2 and Figs. 11 and 12). [3.3.2]

2.3.4 Smoke control: Dnellings with corridor approach

2.3.4.1 Any uncontrolled penetration of smoke to a common corridor from a dwelling which is on fire will jeopardize the escape of the occupants of other dwellings if no other route is available. This risk can be partially reduced by the increased standard of protection recommended within a dwelling for Stage I purposes and by the fitting of fire resisting, self-closing entrance doors (without glazing) to all dwellings. This Code offers designers three ways of securing a degree of protection against penetration of smoke to the common corridor from the front door of a dwellingt

(1) Smoke containment by which smoke escaping from the front doors of dwellings is contained within certain limits by smoke-stop doors across the corridor beyond which persons escaping should not be exposed to smoke. The effectiveness of the method depends on the smoke-stop doors being closed at the time of fire (see **2.3.7.1**). **[3,3.4.1 and 3.3.4.2]**

(2) Smoke dispersal by which smoke is cleared from Stage II escape routes by natural cross ventilation. The effectiveness of the method depends on wind and temperature conditions and on ventilation openings being open permanently or opened manually or automatically at the time of fire (see **2.3.7.2** and **2.5.1**(1)). **[3.3.4.3]**

(3) A new method of smoke control by which smoke is repelled by mechanical ventilation from pressurized areas. The effectiveness of the method depends on an adequate air supply being available at the time of fire (see **2.5.1**(1)).

2.3.5 Flats with corridor approach where every dwelling is provided with an independent alternative escape route to a main stairway

2.3.5.1 The risk of smoke to occupiers in corridor-approach blocks may be reduced by the provision of an alternative escape route from each flat to a main stairway. This can be done by the addition of continuous balconies leading back to the main stairway(s) (see Fig. 17) or by carrying a stairway from each flat (see Fig. 6) or from a pair of flats, up (or preferably down) to a common corridor on another floor or up to roof level, so that occupants may reach a main stairway across the roof. In the case of a continuous balcony, it is essential that there be no risk that a fire in one flat will block the escape route from another fiat to the main stairway. Where the balcony leads in one direction only to a main stairway, the external wall of any flat abutting the balcony should be constructed in accordance with the recommendation given in **2.3.2.** **[3.3.3]**

2.3.5.2 The provision of an alternative means of escape by a linking balcony (see Fig. 17) in Stage I may not be acceptable as an alternative exit in Stage II where smoke containment has been incorporated in a horizontal escape route, if the second dwelling leads into the same section of the main approach route from which the first dwelling is entered. Should the second dwelling lead into another section of the escape route nearer to a main stairway, then a linking balcony may be permitted as an altemative means of escape in Stage II. However, because no dwelling should discharge into an escape route beyond the fire resisting door on the only route to a main stairway, advantage of this could only be taken in the case of a multi-stairway building. **[3.3.3]**

2.3.6 Flats with corridor approach where one fiat or more is not provided with an independent alternative escape to a main stairway: General

2.3.6.1 Where an altemative exit is not provided, the risk of persons being trapped in their fiats by smoke which reaches the corridor outside their fiat from a fire originating in another flat will be reduced if the travel distance from any one flat exit door to a place of safety is limited. In the recommendations, a limited distance from the entrance door of a flat to a smoke-stop door opening into a place of safety has been adopted as the maximum. This is an arbitrary figure. The shorter the distance, the better, but it could not be said that a slightly greater distance would be so unsafe that it should under no circumstances be adopted. However, the maximum distance recommended should not generally be exceeded.

2.3.6.2 The place of safety may be a stairway or a lobby or corridor leading to a stairway. It should be appreciated, however, that a stairway, lobby or corridor which can itself become filled with smoke will not at

such a time be a place of safety. In other words, a place which is safe when a fire occurs in one position may not be safe if a fire occurs in a different position. Where this condition exists, it is essential that an alternative exit should be available.

2.3.6.3 The travel distance referred to in 2.3.6.1 above is devised as an escape measure and as a means of reducing to a minimum the risk that persons might be trapped on a common escape route. This risk cannot be eliminated, however, and the safety of the occupants of dwellings which are not provided with an alternative exit necessarily rests ultimately upon the protection afforded by the fire resisting, self-closing entrance and room doors mentioned in 2.2.1. One purpose of the doors is to hold back fire or smoke within a dwelling in order to keep the common escape passages clear. The doors will also serve to hold back, from entering a dwelling, fire or smoke which has reached the common escape passage from another dwelling. The occupants, therefore, should be safe if they remain in the dwellings until tbe fire has been extinguished. [3.3.4]

2.3.7 Flats with corridor approach where one flat or more is not provided with an independent alternative escape to a main stairway: Application

2.3.7.1 *Smoke* containment

2.3.7.1.1 The circumstances considered in 2.3.6.1 and 2.3.6.2 are illustrated in Figs. 21a, 21*b* and 22. In Fig. 21*a*, the place of safety is a lobby leading to a stairway, no flat exit door being further from the door separating the corridor from the lobby than the recommended maximum travel distance. In Fig. 21*b*, however, the lobby can become smoke-filled from a fire occurring in Flat No. 1 and will not at such a time be a place of safety for the occupants of flats Nos. 2, 3 and 4. Under this condition it is essential that there should be an alternative exit from the corridor or from each dwelling.

2.3.7.1.2 In Fig. 22 the risk illustrated in Fig. 21*b* has been removed by adopting a different plan in order to provide an alternative exit. No flat exit door is more than the recommended maximum travel distance from a place of safety and, although both places of safety can become smoke-logged at different times (see Figs. 22*a* and 22*b*), the alternative exit provides safety at all times.

2.3.7.1.3 A solution which provides safety in Stage II with only one stairway but with more flats per floor than are possible with the design shown in Fig. 21a, is to open all the flats into lobbies which are permanently open to the air and which are separated by smoke-stop doors from the corridor out of which the main stairway opens (see Fig. 23). The purpose of the permanent opening to the lobby is to vent any smoke that might reach the lobby from a fire in a flat, and so reduce the risk that the smoke will penetrate the smoke-stop doors which protect the corridor. Provided the corridor is protected throughout its length in this maimer, a limited length of ' dead-end ' will not prove unsafe. Hence the possibility of increasing the number of flats per floor in a single stairway building. The exit doors from the flats should, of course, be arranged to comply with the principle referred to in 2.2.1 and 2.2.2. [3.3.4.2]

2.3.7.2 *Smoke dispersal*

2.3.7.2.1 Using the method of smoke dispersal, the place of safety will usually be a stairway because, as smoke is unlikely to attack the stairway, it is not considered necessary to have a stairway protection lobby. To ensure adequate through flow of air it is essential that the access corridor between cross-ventilation openings is not interrupted by smoke-stop doors.

2.3.7.2.2 The smoke dispersal method is illustrated in Figs. 13*b*, 14*b*, 15*b*, 16*b* and 18*b*. In Fig. 13*b* the place of safety is a stairway and the maximum travel distance between any flat exit door to the stairway enclosure door should be limited. Where escape is possible in one direction only (a ' dead-end ' condition) as illustrated in Figs. 14*b*, 15*b* and 16*b*, it is recommended that this maximum travel distance be reduced. [3.3.4.3]

2.3.8 Maisonettes with corridor approach. The principles stated in 2.3.5 to 2.3.7 for flats apply equally to maisonettes. It will be found in practice, however, that a solution similar to that described in 2.3.5 will be the normal one because of the need to provide alternative exits from maisonettes in connection with Stage I. There is, therefore, usually no need to apply the principle of either smoke containment or dispersal to the common internal approach corridor.

2.4 STAGE III

2.4.1 General

2.4.1.1 Stage III is concerned with the safety of occupants using a main vertical escape route, i.e. a stairway (lifts cannot be considered for escape purposes, primarily because of the delay that may be experienced before a lift answers a call, the limited capacity of the lift when it arrives and the possibility of failure of the electricity supply in the event of fire).

The main objectives are:

(1) to remove sufficiently the risk that smoke or fire might enter a stairway at any point and render it impassable above that point; and

(2) to ensure that the escape route from the bottom of the stairway to the outside air is adequately protected.

2.4.1.2 The importance of the second of the objectives given in **2.4.1.1** is sometimes overlooked. A satisfactory ground floor plan cannot always easily be developed from a satisfactory upper floor plan and occasionally a satisfactory upper floor plan will produce problems at ground level which are incapable of solution. Upper and ground floor plans should therefore be developed together. The problems and the precautions necessary with maisonettes are the same in Stage III as with flats.

2.4.2 Main stairway arrangement and protection

2.4.2.1 The minimum protection that should be given to any stairway is to 'enclose' it, i.e. to surround it with fire resisting walls with self-closing, fire resisting access doors. As a dwelling is a likely source of fire, no dwelling (except in the conditions described in **2.4.2.5**) should be entered directly from a stairway. In corridor access blocks, therefore, the corridor, and in balcony/deck access blocks the balcony or deck, should separate dwelling entrance doors from a main stairway. Similarly, and particularly in a single stairway building, no store, refuse chamber or other fire risk, such as a gas meter room, an electric intake or a cleaner's cupboard, should open directly on to a stairway. [3.4.1]

2.4.2.2 Even when the precaution outlined in **2.4.2.1** is taken, there remains some risk that smoke will enter a stairway and this risk should be countered. There are three methods:

(1) One method is to provide two stairways in a building on the assumption that smoke is unlikely to enter more than one stairway at any time. This assumption may prove false, particularly if the stairways are close together. A safeguard using smoke containment, in Stage II is to provide a smoke-stop door across the internal communicating space between the stairways so that, if a fire occurs at any point, one stairway will enjoy the protection of an additional smoke-stop door on that floor. Such a door is shown in Fig. 22. It was provided, initially, in order to meet the recommended travel distance limitation of the second stage. It will be seen however, that the same door also contributes to safety in the third stage as there will always be the protection of two smoke-stop or fire resisting doors between one of the stairways and a smoke-logged corridor (see Figs. 22a and 22*b*).

(2) The second and more effective method where smoke containment is adopted is to enter the stairway from a lobby which is permanently ventilated to the open air and which is itself entered only from the internal communicating space through a smoke-stop door. In this case the stairway will have the protection of two smoke-stop doors and a ventilated lobby. This arrangement is so safe that, provided the stairway enclosure has no weakness, a building with a single stairway so arranged can be regarded as having safe means of escape in the third stage. Fig. 21a illustrates such an arrangement. It will be noted that there is no requirement in Stage II for the lobby (see Fig. 21a) to have permanent ventilation, since this lobby cannot be attacked by smoke or heat in this stage and thus form a trap for those wishing to escape from the flat. Should a fire not be extinguished early, however, smoke might eventually reach the lobby and the permanent ventilation is a necessity to ensure the dissipation of smoke and heat in Stage III, as a protection to the stairway.

(3) The third method, using smoke dispersal in Stage II, is to achieve cross-ventilation in the communicating spaces leading to main stairways by means of manually operated ventilators together with either permanent openings or ventilators automatically controlled by smoke detectors.

2.4.2.3 In balcony or deck approacb dwellings, where the stairway enclosure is entered from the balcony or deck, or from a corridor which is entered from the balcony, the measure of safety is equivalent to that provided by a ventilated lobby and a single stairway may again be regarded as safe in the third stage. It is essential, however, that safety in the second stage should be assured, as described earlier, and that the stairway should be enclosed and entered through smoke-stop doors on all floors. [3.4.3.1(1)]

2.4.2.4 An alternative method of protecting the stairway in a single stairway building with smoke containment is shown in Fig. 23, a design developed initially to provide adequate safeguards in Stage II. Here the arrangement described in the previous paragraphs is reversed. All the dwellings open directly into permanent ventilated lobbies and the corridor out of which the stairway is entered is itself entered only from these lobbies through smoke-stop doors. It will be observed that in this system, as in the system described in the preceding clauses, the stairway is protected by two smoke-stop doors and a ventilated lobby but that the relationship of the ventilated lobby to the stairway is different in the two systems (see Figs. 21a and 23).

2.4.2.5 In blocks not exceeding four storeys in height and served by a single stairway providing internal access for a limited number of dwellings within prescribed floor areas, relaxation of certain principles already discussed is considered reasonable and may therefore be regarded as acceptable. Because of limits imposed on the number of dwellings, their entrance doors may have access via a lobby and a self-closing, fire resisting door to the main stairway. The purpose of this lobby (which, depending on the number and sizes of dwellings it serves, may need to be ventilated) is to protect the vertical escape route so that occupants may safely pass any dwelling at a lower level endangered by fire. Where the floor areas of dwellings do not exceed the minimum prescribed limit, it is considered reasonable to assume that as the uppermost dwellings would not normally place at risk those at a lower level, therefore the upper dwellings may have direct access to the stairway. The stairway should be permanently ventilated at its head and should have openable windows at landings. [3.4.3.3]

2.4.3 Protection of main stairways: Summary. The methods of protection to stairways described in **2.4.2** can be summarized as follows:

(1) Where there is more than one stairway serving corridors without cross-ventilation, there should be a smoke-stop door across the corridor between the doors in the enclosing walls of any two stairways.

(2) Where there is only one stairway serving corridors without cross-ventilation, there should be a smoke-stop door across the corridor between the door in the enclosing walls of the stairway and any door covering a potential source of fire (e.g. a dwelling entrance door, refuse chamber, or door to a storage space) and at least one of the resulting spaces should take the form of a lobby which is permanently ventilated through an adjoining external wall.

(3) Where there are one or more stairways serving corridors provided with cross-ventilation by means of manually operated ventilators, together with either permanent openings or ventilators automatically controlled by smoke detectors, a smoke-stop door only is recommended in the enclosure separating the stairway from the corridor.

2.4.4 Stairway located internally. In the recommended methods of protection to stairways provision is made in some cases, where smoke containment is used, for ventilating the common access space leading to the stairways by means of doors or windows, which can be opened where there are two stairways (see **2.5.3** and **2.5.4**) or through a permanent vent in the external wall where there is only one stairway. Such ventilation may also be provided by the smoke dispersal method (see **2.5.1**). Where the above provision is made, it is considered that stairways can safely be located in the interior of a building, if desired, and not necessarily on an extemal wall. Where they are so located they should have permanent ventilation at the top. The exits at ground floor should take the form described in **2.4.5**. Any inlet air that may be necessary for the normal ventilation of the stairway can be obtained by keeping open the ground floor entrance doors. [3.4.6]

2.4.5 Protection of the escape route from the bottom of a stairway to the open air at ground or podium level [3.4.1]

2.4.5.1 On the upper floors of a building the stairway enclosure and the fire resisting, self-closing doors in the enclosure protect any occupants who may be on the stairway and passing a floor on which there is a fire. At ground or podium level, however, the direction of escape changes, becoming horizontal instead of vertical, and it is essential that the same measure of protection be given to the horizontal part of the route against a fire on the lower floor as is given to the vertical part of the route against a fire on an upper floor.

2.4.5.2 The mistake is sometimes made of adopting the same form of enclosure at ground floor as on the upper floors, i.e. of placing a door in the stairway enclosure at ground floor in a position similar to that on the upper floors. A door in this position cannot serve the same purpose on the lower floors as on the upper floors since, on tbe upper floors, the doors to the stairway are both a means of access to the stair and a protection to people on the stairways; but on the lower floor the door can only be a means of egress from the stairways; it cannot protect people once they have passed through it. Such an arrangement does not therefore meet the recommendation made in **2.4.5.1** that the whole of the route to the extemal air must be equally protected.

2.4.5.3 The mistake described in **2.4.5.2** above is illustrated in Fig. 24*b* which shows a possible form of ground floor arrangement for the upper floor plan shown in Fig. 24a. It is clear that the arrangement shown in Fig. 24*a* is satisfactory because the smoke-stop doors to the stairways protect the stairways for the benefit of all the occupants above the floor on which the fire occurs. Yet the same arrangement is not satisfactory on the ground floor under tbe same circumstances (see Fig. 24*b*) because in order to reach the exit door from the building it will be necessary for the persons on the stairway to pass from the protection of the stairway through the smoke-logged entrance conidor in order to make their escape.

2.4.5.4 Another not uncommon mistake has been to discharge two stairways through a common exit on the lower floor, e.g. into the main entrance. Whilst some means of access between the common space at ground level and at least one of the stairways will clearly be convenient, any such means of access will not necessarily provide safe means of egress from the stairway. Moreover, if stairways are linked at lower level by the common space, there may be a risk that both will be attacked by a fire commencing on the ground floor. Stairways should therefore be separated at ground floor as they are on upper floors and each stairway should have a means of egress which is independent of, and properly separated from, the means of egress from the other stairway.

2.4.5.5 The measures of protection which are necessary are summarized in **2.4.3(1)**. The ground floor plan illustrated in Fig. 24c meets the standard of protection recommended where there are two stairways and Fig. 21c illustrates a ground floor plan which is suitable for the upper floor plan shown in Fig. 21a and which meets the standard of protection recommended where there is only one stairway. The communicating doors in the stairway enclosure shown in Figs. 24c and 21c are not, of course, essential. Should they be omitted, there would be no need for protecting the stairway at ground level, as described in **2.4.3(1)**.

2.4.5.6 The exit at ground level should, as far as possible, be in a position which is free from risk from adjoining doors or windows. Whilst a degree of risk can be tolerated where there are two stairways with separate exits, no such degree of risk should be accepted where there is only one stairway. One solution, if there is difficulty in the latter respect, is to provide two exits from the one entrance hall, either of which may be subject to some risk, but not both at the same time from the same fire (see Fig. 25).

2.4.5.7 A lift introduces a negligible fire hazard provided landing doors are fire resisting; the motor room is at the top and permanent ventilation is provided at the top of the shaft. There is, therefore, no objection to arranging lifts within a stairway enclosure on any floor, including the entrance floor.

2.4.5.8 Stores and ancillary accommodation are often planned at ground level and the same protection should be provided between stairways and the public space that serves such accommodation as is provided between stairways and the public space that serves the flats themselves.

2.4.5.9 Basement fires can lead to particularly hazardous conditions and, where any dwelling has access to only one stairway, the stairway should not continue to a basement, nor should a stairway to a basement

open out of any part of the building which has any connection to the main stairway. Even where every dwelling has access to two stairways, neither stairway should be continued directly to a basement but if one stops at ground level it need not be regarded as unsafe to continue the other one indirectly, i.e. by forming a ventilated lobby with two smoke-stop doors across the basement stairway in order to protect the ground floor escape route from the upper floors. [3.4.3.2] [3.4.4]

2.4.5.10 Reference should be made to Sections 5 and 6 in connection with ' Ancillary accommodation ' and ' Engineering services ' recommendations relevant to this clause (2.4.5).

2.5 VENTILATION IN STAGES II AND III

2.5.1 The dilution and dispersal of smoke entails the provision of natural or mechanical ventilation by:

(1) the provision of natural cross-ventilation in a main corridor obtained by means of manually operated ventilators, together with either permanent openings or ventilators automatically controlled by smoke detectors (see Fig. 26). Such cross-ventilation should not be interrupted by smoke-stop doors and the position of openings should be carefully considered to avoid short circuits or conditions of no differential pressure. The recommendations for the sizes and spacings of ventilation openings are those which are considered to be effective with a minimum wind speed of 5.5 kilometres per hour (approximateiy 3.4 miles per hour); but as it will not be possible to ensure this minimum condition at all times, an element of risk exists. It must be accepted that all risks cannot be entirely eliminated in means of escape, as, for example, in the failure or misuse of a self-closing door. However, careful planning of cross-ventilation can further reduce this risk by ensuring that openings are so placed that air currents along access corridors are induced from high to low areas of pressure (see Figs. 13*b*, 15*b* and 18*b*); or

(2) the provision of mechanical ventilation which may be acceptable in certain buildings. It is sometimes called ' pressurization ' and entails mechanically maintaining a positive air pressure in Stage II and/or Stage III escape routes, so that smoke will be impeded from entering these routes from a fire within a dwelling. Full development of this method, however, lies in the future. [6.4]

2.5.2 Where the principle of using natural cross-ventilation or mechnical ventilation is not adopted as a basis for the design of means of escape in Stage II, this is not to deny that facilities for the removal of smoke from corridors will prove beneficial. If a degree of permanent ventilation can be introduced into a building some gain in safety can result.

2.5.3 The provision of means of ventilation, as distinct from permanent or automatically controlled ventilation, may contribute to personal safety in a more general way. It will assist the fire service and will thereby reduce the risk that smoke will spread within the building. Tbis Code therefore contains recommendations for a measure of ventilation to corridors but, as this provision is for the use of the fire service and is not directly related to safety during early escape, it is not necessarily provided in the form of permanent openings. Windows or doors that can be opened when desired will suffice (see Fig. 24a). The permanent openings to lobbies serve a different purpose since their function is to be effective at the time of escape. These openings, together with the doors that separate the lobbies from the corridor, may be used for venting tbe latter (see Figs. 15a, 18a and 23).

2.5.4 Although the general recommendation is that corridors should be capable of being ventilated independently of stairways, where any corridor (where smoke containment is used) is connected to two or more stairways these may safely be used for ventilation purposes (see Fig. 22). The stairways should, however, have permanent ventilation at every storey level to reduce the risk of their acting as flues, except that where each dwelling is provided with an independent alternative escape route to a main stairway the ventilation need not be permanent but may be by means of openable windows or ventilators. Where permanent openings are provided, the penetration of snow cannot be prevented, but fixed louvres will reduce the amount and will also reduce the degree of penetration by rain. Because penetration by snow cannot be wholly prevented, the

altemative method of venting, independently of stairways, is to be preferred. The fixing of louvres should not reduce the actual clear area required for permanent ventilation.

2.5.5 The above recommendations for ventilation may call for modifications in designs which are based only on earlier considerations. For example, if the stairways shown in Fig. 22 are not permanently ventilated as described above, the common corridor (serving flats without altemative means of escape) should be extended to the extemal walls as shown in Fig. 24*a*.

3. PLANNING: RECOMMENDATIONS

3.1 GENERAL

The principles expressed in general terms in Section 2 are set out below in the form of specific recommendations. This subject is one which calls for elasticity of approach and the specific recommendations which follow should be interpreted in the light of the previous discussion. (The numbers of corresponding clauses are shown in square brackets.)

NOTE. Figures are intended only to clarify points made in the text; it should not be assumed that these plans are more satisfactory than others which may be devised.

3.2 STAGE I: INTERNAL PLANNING OF FLATS AND MAISONETTES

3.2.1 Flats. Every flat should have a protected private entrance hall and every living room and bedroom should have an exit which leads to hall or lobby. The recommendations given in *either* 3.2.1.1 or 3.2.2.2 should be applied.

3.2.1.1 Bedrooms should open directly out of the entrance hall and, wherever possible, their doors should be nearer to the entrance door of the flat than the door of a dining room, a living room or a kitchen (see Fig. 1). Where this arrangement is not practicable, the bedrooms may be further from the flat entrance door than other rooms provided that, in either case, no bedroom door is further from the main entrance door of the flat than 7.5 m (approximately 25 ft) (see Fig. 2). In both cases, all rooms other than bathrooms and w.c.'s (containing no fire risk) opening off the hall should be fitted with a Type 3 fire-resisting door (cupboard doors need not be self-closing) and the enclosing walls of the hall should have a fire resistance of not less than half-an-hour. [2.2.2.2]

3.2.1.2 Where the distance from a bedroom door to a flat entrance door exceeds 7.5 m (approximately 25 ft) (see Fig. 2) an alternative means of escape should be provided from that bedroom or by corridor, if more than one bedroom is involved, in addition to the requirements contained in 3.2.1.1 above. A linking balcony (see Fig. 17) (access to which should be by way of a doorway or suitably designed window with a very low sill) of minimum width 900 mm (approximately 3 ft) and a balustrade, minimum height 1200 mm (approximately 4 ft), to an adjoining flat is one acceptable solution. If it is necessary to pass from one bedroom to another in order to reach the altemative exit, the bedrooms should be connected by a pass door if the travel distance from any bedroom door to the door of another room in which the alternative means of escape is located exceeds 1.5 m (approximately 5 ft); or by an inner hall which is cut off by Type 3 fire-resisting doors located in partitions with a fire resistance of not less than half-an-hour from any other part of the flat (see Fig. 3). In any flat with an inner hall used in a planning arrangement similar to that illustrated in Fig. 3, any intemal partition situated between the sleeping and living accommodation should also have a fire resistance of not less than half-an-hour. [2.2.2.3]

3.2.2 Flats entered from a floor above or from a floor below the flat

3.2.2.1 Where any flat is entered from the floor above or the floor below, no habitable room or kitchen should open off the entrance hall, nor should any meter cupboard, portable heating appliance, fixed heating appliance with a fire risk, casual storage or any other source of potential fire risk be situated in the entrance hall or on intermediate landings (see Figs. 4 and 5). [2.2.2.2]

3.2.2.2 Where any flat is entered from the floor below, the distance from the furthest bedroom door to the head of the stairway should not be more than 7.5 m (approximately 25 ft) (see Fig. 4). Where this distance is exceeded, an alternative exit from the bedroom or corridor should be provided (see **3.2.1.2**). **[2.2.2.3]**

3.2.2.3 Where any flat is entered from the floor above, an alternative exit should always be provided (see **3.2.1.2** and Fig. 5). **[2.2.2.4]**

3.2.3 Maisonettes

3.2.3.1 Every maisonette, other than those of ' open plan ' arrangement, (see **3.2.3.4**), should have:

(1) a private entrance hall, with stairway, in which there is no fire risk All living rooms and bedrooms should have direct access to this hall, or landing, without having to pass through another room. Doors to living rooms and kitchens at entrance level should be located as far as is practicable away from stairways (see Figs. 7A and 7B). Except in the planning arrangement (see Fig. 7A(i)) where each bedroom is separately provided with an alternative means of escape leading directly away from the dwelling and is located above the living and entrance level, all rooms other than bathrooms or w.c.'s containing no fire risk opening off the hall or private stairway landing should be fitted with Type 3 fire-resisting doors (cupboard doors need not be self-closing), and the enclosing walls of the hall and private stairway landings should have a fire resistance of not less than half-an-hour; and **[2.2.3.2 and 2.2.3.3]**

(2) an alternative exit from every floor on which habitable rooms are located, other than the entrance floor. This exit should lead directly to a main escape route outside the maisonette (see Fig. 6) or, for the purposes of Stage I, via a doorway, or a suitably designed window with a very low sill to a linking balcony leading to an adjoining dwelling (see Figs. 7A, 7E, and 17). If an alternative escape route is provided internally by means of a private stairway leading up or down to a completely independent route outside the maisonette, then a Type 3 fire-resisting door should be located between each floor level (see Fig. 6); and **[2.2.3.2 and 2.2.3.6]**

(3) if the escape route from any bedroom passes across the landing at the head of the stairway and the distance travelled exceeds 1.5 m (approximately 5 ft), a screen cutting off this landing from the floor level(s) below, with a fire resistance of not less than half-an-hour and incorporating a Type 3 fire-resisting door (see Figs. 7A(ii), 7B(ii) and 7D(ii)). **[2.2.3.4]**

3.2.3.2 Where bedrooms are located on a floor level below the entrance level and the escape route from any bedroom passes across the circulation space formed at the base of the stairway, then, if the distance of travel from any bedroom door to the door of another room in which the alternative means of escape from that floor level is located exceeds 1.5 m (approximately 5 ft) the circulation space should be cut off from the floor(s) above by a screen with a fire resistance of not less than half-an-hour, incorporating a Type 3 fire resisting door (see Fig. 7B(ii)). This protection may be omitted (see Fig. 7B(iii)) where this travel distance is less than 1.5 m (approximately 5 ft). Alternatively, if the plan permits, pass doors (which should be designed to open inwards or in both directions) between rooms may be provided in order to remove the necessity for escaping across a landing (see Fig. 7A(iii)). **[2.2.2.4]**

3.2.2.2 Where all the bedrooms are at the entrance level and living rooms and kitchens are on the floor above, no screening of the stairway is necessary (see Fig. 7C). **[2.2.3.4(1)]**

3.2.3.4 In certain designs of open plan maisonettes (see Fig 7E) unenclosed stairways may be accepted within living rooms (usually referred to as 'open planning ') as long as:

(1) at entrance level, a protected lobby is provided within the dwelling to safeguard the Stage II escape route and an alternative means of escape is provided from any other enclosed habitable room, not opening into the lobby, at this level (alternative means of escape should be via an external balcony, as recommended in **3.3.3.1**); and

(2) an alternative means of escape is provided from all other floors within the maisonette upon which habitable rooms are located and the stairway is protected if escape is across the landing at this level, as recommended in **3.2.3.1(3)**, (see Figs. 7A to 7D). Where an alternative means of escape is provided from each

habitable room at levels other than the entrance level, then ths protection to the stairway may be omitted (see Fig. 7A(i) and 7E).

Where an alternative means of escape is provided from all habitable rooms within the dwelling via an extemal balcony, as reconunended in 3.3.3.1, the entrance lobby within the dwelling may, in certain cases, be omitted. These principles of protection should be repeated in all other dwellings located on the same floor, using the same Stage II escape routes.

3.3 STAGE II: ESCAPE ROUTES FROM FLATS OR MAISONETTES TO MAIN STAIRWAYS

3.3.1 Dwellings with balcony or deck approach. Depending on the means of escape provided in a dwelling for Stage I requirements, escape from each dwelling should be possible:

(1) along the balcony in opposite directions to two main stairways, travel distance being restricted to only that required by the fire service for fire fighting access (see Fig. 8); or [2.3.2]

(2) along the balcony in one direction to one main stairway and via an additional completely independent route to a main stairway (which may be the same stairway), travel distance being restricted to only that required by the fire service for fire fighting access (see Fig. 10) (where there is an undivided space within a dwelling abutting on to both exit routes, it is essential that one extemal wall should be protected as in (3) below); or [2.3.2]

(3) along the balcony in one direction only to one main stairway, travel distance being restricted to only that required by the fire service for fire fighting access (see Fig. 9). The walls of dwellings abutting the balcony should have a resistance to intemal fire of at least half-an-hour for a height of at least 1100 mm (approximately 3 ft 7 in) above balcony finished floor level. Glazing should not be provided below this height. Protection should also be provided to ceilings of balconies and decks in appropriate circumstances. [2.3.2]

3.3.3 Dwellings with entrance doors opening indirectly off a balcony or deck via a snbsidiary stairway

3.3.3.1 Due to the unique nature of the subsidiary stairway design, escape in Stage II does not always occur as each dwelling has direct access to a common stairway. To prevent unnecessary cross reference, recommendations conceming dwellings approached directly from a subsidiary stairway have been included in this section.

3.3.2.3 Where flats are not provided with an alternative means of escape, then:

(1) the subsidiary stairway should extend no more than one storey above and one storey below the access deck or balcony (see Fig. 12); [2.3.3]

(2) no flat should be entered off tbe subsidiary stairway at balcony, or deck, level, and there should be not more than three flats opening off the stairway at the upper level and three flats at the lower level. Flats should be entered and wholly contained within one level (see Fig. 12); [2.3.3]

(3) fiat entrance doors should be designed to have direct access to the head or base of a subsidiary stairway. Where, in special conditions, this is not practicable, no flat entrance door at the upper or lower level should be more than 5 m (approximately 16 ft) from the head, or foot, of the subsidiary stairway (see Fig. 12); [2.3.3]

(4) the subsidiary stairway should not be enclosed at deck level (see Figs. 11 and 12) and, where the stairway leads upwards from the balcony, it should be ventilated at the head, in accordance with 3.4.6. The space beneath the stairway, at the lowest flight, should be sealed off to prevent unauthorized storage. The subsidiary stairway should be designed to prevent snow and ice forming on it in adverse weather conditions; [2.3.3]

(5) the travel distance from a dwelling entrance door, approached via a subsidiary stairway, to a main stairway need be restricted only to tbe distance required by the fire service for fire fighting access (see Fig. 11, 7.1.4 and 7.3.1). [2.3.3]

3.3.2.3 Where flats are provided with independent altemative escape routes, and in maisonettes, the recommendations in 3.3.2.3 (1), (2), (3) and (4) need not be adopted, except that the subsidiary stairway should be protected from adverse weather conditions.

3.3.3 Dwelliogs with corridor approach, where every dwellIng is provided with an independent alternative escape route to a main stairway

3.3.3.1 The alternative escape route should he wholly independent of the normal approach route, e.g. by a balcony leading directly to a main stairway or by a private stairway leading directly, and preferably downwards, to a common access corridor on another floor (this stairway may serve more than one dwelling provided it can be entered from each flat independently of the normal approach route) or in some cases a linking balcony may be acceptable. As a protection to the common corridor on the other floor, the stairway should be separated from tbe corridor by a Type 3 door (see Fig. 6). Dwelling entrance and escape doors leading onto internal access corridors should contain no glazing. [2,3.5]

3.3.3.2 If the alternative exit is a balcony and in escaping from one dwelling it is necessary to pass another dwelling in order to reach a main stairway, then either the external walls of the latter dwelling should be protected as in 3.3.1(3) or the balcony should lead in both directions to a stairway or the dwelling should have access to balconies on opposite sides of the block, each leading to a main stairway. [2.3.5]

3.3.3.3 The common access corridor should be extended to an external wall either directly or indirectly through a lobby or, if there is more than one stairway, the corridor may be extended indirecdy through the stairways. If the corridor does not exceed 30 m (approximately 100 ft) in length, a connection with an externai wall at one point will be sufficient. If the length exceeds 30 m (approximately 100 ft), the corridor should be extended to an external wall at its extremities. At the point(s) of contact with an external wall there should be either a door to an external balcony or a window or ventilator which has openable ventilation in the external wall having a free area of not less than 1.5 m^2 (approximately 15 ft^2). If the connection is through a stairway, there should be openable windows (ventilators) in the external wall of the stairway having a free area of not less than 1.5 m^2 (approximately 15 ft^2) in every storey height of the stairway. This connection should not be through the stairway in a single stairway building (see also 7.1.4 and 7.3.1) (see Figs. 17, 21 and 22). [2.5.3]

3.3.3.4 Where the route (along the corridor) from a dwelling entrance door leads in one direction only to a main stairway (i.e. the ' dead-end ' condition, see Fig. 17), the entrance door of every such dwelling should not be more than 40 m (approximately 130 ft) from the main stairway (see also 7.1.4 and 7.3.1).

3.3.3.5 Where the route (along the corridor) from a dwelling entrance door leads in two directions to two main stairways, the entrance of every such dwelling should not be more than 50 m (approximately 164 ft) from one of the stairways (see Fig. 17) (see also 7,1.4 and 7.3.1).

3.3.4 Dwellings with corridor approach where any one dwelling or more is not provided with an independent altemative escape route to a main stairway

3.3.4.1 As discussed 2.3, a designer has the choice of two recommended methods of protection (either smoke containment or smoke dispersal) for Stage II escape routes.

(1) Smoke containment involves the provision of permanent ventilation in some cases and Type 4 fire resisting doors across corridors, and is related basically to travel distances up to, and including, 4.5 m (approximately 15 ft). [2.3.4.1(1)]

(2) Smoke dispersal entails the use of permanent or automatically controlled and manually operated cross ventilation, thus removing the necessity for smoke-stop doors across any corridor, and can be applied to all Stage II travel distances. [2.3.4.1(2)

3.3.4.2 *Smoke containment.* The entrance door of every dwelling should either:

(1) open into a corridor and be not more than 4.5 m (approximately 15 ft) away from a door in the enclosing wall of a main stairway (see Figs. 13a and 14a) or from a Type 4 fire resisting door across the corridor between the entrance door of the dwelling and a main stairway (see Figs. 13a and 14*a*). In the latter case, if the entrance door of any other dwelling opens into the corridor on the stairway side of the Type 4 fire resisting door, there should be an alternative route from the entrance door of the original dwelling to a main stairway (e.g. along the corridor to another main stairway in the opposite direction); or [2.3.7.1]

(2) open into a corridor and be not more than 4.5 m (approximately 15 ft) away ftom a Type 4 fire resisting door separating the corridor from a ventilated lobby which opens into a main stairway, is connected only with common access space, adjoins an extemal wall and has a permanent opening in the extemal wall with a free area of not less than 1.5 m^2 (approximately 15 ft^2) (see Fig. 1*b*a); or [2.3.7.1]

(3) open into a ventilated lobby and be not more than 4.5 m (approximately 15 ft) away from a Type 4 fire resisting door separating the lobby from a corridor which leads to a main stairway. All dwellings on the floor should open into such a lobby and all such lobbies should adjoin an extemal wall and have a permanent opening in the extemal wall with a free area of not less than 1.5 m^2 (approximately 15 ft^2) (see Figs. 15a and 18a). [2.3.7.1]

In addition, it is necessary that:

a. where a dwelling entrance door lies between two main stairways it should be not more than 30 to (approximately 100 ft) from a main stairway. Where there is access in one direction only (via a Type 4 door) to a main stairway, the entrance door of the dwelling should not be more than 15 m (approximately 50 ft) from that stairway (see Figs. 13a, 14a and I5a); and [2.3.7.1]

b. any ' dead-end ' section of a corridor should be separated by a fite resisting door from any other part of the corridor on the far side of the stairway from the ' dead-end ', except that this door may be further along the corridor beyond the stairway provided that not more than four flats are enclosed within the section of the escape route so formed.

3.3.4.3 *Smoke dispersal*

3.3.4.3.1 Where the route from a dwelling entrance door leads in one direction only to a main stairway (i.e. the ' dead-end ' condition), the door should not be more than 15 m (approximately 50 ft) from a door in the enclosing wall of a main stairway (see Figs. 14*b*, 15*b*, 16*b* and 18*b*). [2.3.7.2]

3.3.4.3.2 Where the route from the entrance door of a dwelling leads in two directions to two main stairways, the door should not be more than 40 m (approximately 130 ft) from a door in the enclosing wall of a main stairway (see Figs. 13*b* and 14*b*) (see also 7.1.4 and 7.3.1). [2.3.7.3]

3.3.4.3.3 Stage II common access corridors serving dwellings should be cross ventilated. At each point of contact with an external wall, there should be an opening with a free area of not less than 1.5 m^s (approximately 15 ft^2) of which 0.5 m^2 (approximately 5 ft^2) should be either a permanent opening or a ventilator(s) automatically oontroiled by smoke detectors, and 1 m^s (approximately 10 ft^2) openable by hand, at the highest level possible in each corridor; if desired, the whole 1.5 m^s (approximately 15 ft^2) may open automatically provided there is an overriding manual control. [2.3.7.2]

3.3.4.3.4 Where ventilation openings are automatically controlled by smoke detectors in access corridors, the heads of such detectors should be fixed to the ceiling at not more than 20 m (approximately 65 ft) from centre to centre (see Fig. 26). [2.5.1]

3.3.4.3.5 The maximum distance between direct connections to external walls in cross ventilated corridors should be 60 m (approximately 200 ft) (see Figs. 13*b*, 14*b*, 15*b* and 18*b*). [2.5.1]

3.3.4.3.6 Stairway protection lobbies, as distinct from stairway enclosures, are unnecessary where corridors are cross ventilated as recommended, provided there are no fire risks in the corridors (refuse chutes may be accessible via a self-closing, fire resisting door from the corridor) (see also 4.5). [2.3.7.2]

3.3.4.4 In all cases, dwelling entrance and escape doors leading directly on to internal access corridors should contain no glazing.

3.4 STAGE III: MAIN STAIRWAYS IN BLOCKS OF FLATS OR MAISONETTES

3.4.1 Enclosure of main stairway

3.4.1.1 All main stairways should be enclosed throughout their height, as described in 2.4.3.1, except that where the ground or podium storey is designed as a permanently open pedestrian space aad is kept free from

fire risk, the stairway enclosure at ground level may be omitted. No enclosure is necessary above the level of the roof of the top storey of the building, provided adequate steps are taken to exclude the effects of weather from the stairway. [2.4.2.1]

3.4.1.2. No dwelling, store, refuse chute or other fire risk shouid open directly into a main stairway enclosure. [2.4.2.1]

3.4.1.3 At ground or podium level, a stairway enclosure should be so arranged that the extemal exit door can be reached without passing through any door other than a door provided to form a stairway protection or draught lobby. The space which has to be traversed between the bottom of the stairway and the exit door to the open air should be regarded as an extension of the stairway enclosure and the walls enclosing it should be subject to the same condidons as are recommended in 2.4.2.1 and 2.4.5.1 [2.4.5]

3.4.2 Stairway design

3.4.2.1 Stairway enclosure should be so designed that where a door opens into the enclosure, the swing will not interfere with the free passage of persons across the stairway landing travelling from one floor to another. A clear unobstructed minimum passage of 900 mm (approximately 3 ft) should be maintained.

3.4.2.2 Main and subsidiary stairways should have a minimum width of 1000 mm (approximately 3 ft 3 in) measured between walls, or 900 mm (approximately 3 ft) measured between a wall and the inside of a handrail on any flight. Treads should be not less than 240 mm (approximately 9½ in) wide measured from nosing to nosing; risers should not be more than 190 mm (approximately 7½ in); the pitch of the stairway should not be more than 38°; and there should be not less than two, and no more than sixteen, risers in a flight. The headroom should not be less than 2 m (approximately 6 ft 6 in) measured vertically above the line of the nosings.

A continuous handrail should be provided and where openings for windows, glazed panels or other similar purposes are formed in the portion of a wall required to guard a stairway, they should be guarded by a screen, balustrade or railing and where such openings are glazed from floor to ceiling (or are fitted with lightweight panels) and are on an external wall or overlook an internal well or shaft, close balustrading or other acceptable form of protection should be provided up to a height of 1.07 m (approximately 3 ft 6 in) above the level of any landing, floor or stairway nosing constructed to withstand the impact of any person falling against it.

3.4.3 Single stairway condition

3.4.3.1 Where any dwelling has access to only one main stairway, the stairway enclosure should be entered on all floors from either:

(1) a balcony (see Fig. 9); or [2.4.2.3]

(2) a ventilated lobby:

a. which adjoins an external wall;

b. which has a permanent opening with a free area of not less than 1.5 m^2 (approximately 15 ft^2);

c. into which no dwelling, refuse chamber, store or other fire risk opens;

d. which comnumicates only with the stairway, with a lift or lifts if desired and through a Type 4 fire resisting door with a common approach hall (see Fig. 16*a*) or with an extemal balcony; or [2.4.2.2(2)]

(3) a corridor into which no dwelling, store or other fire risk opens, (refuse chambers may be accepted in certain conditions, see Fig. 15*a*) and which communicates only with the stairway, with a lift or lifts if desired, and through a Type 4 door with either a private or common balcony or with a private or common ventilated lobby adjoining an external wall and having a permanent opening in the external wall with a free area of not less than 1.5 m^s (approximately 15 ft^2) (see Fig. 15*a*) or

(4) a corridor in which manually operated ventilators with either permanent or automatically controlled cross ventilation are provided to Stage II escape routes. Stairway protection lobbies (as distinct from stairway enclosures) and Type 4 fire resisting doors across the corridor should be omitted provided that there are no

fire risks in the corridor (refuse chutes may be accepted in certain conditions, see Fig. 15*b*) and that the design conforms to the recommendations for cross ventilation in 3.3.4,3,3 (see Figs. 15*b* and 16*b*).

3.4.3.2 The stairway should terminate at ground, or podium, level, and any stairway to a basement should be entered from the open air. The arrangement of the exit from the main stairway should be such as sufficiently to avoid the risk that smoke issuing from a fire in the basement or ground floor would obstruct the exit from the stairway. [2.4.5.9]

3.4.3.3 In a building not exceeding four storeys in height above ground or podium level, and where there are not more than four dwellings per entrance floor, 3.4.3.1 (except for the recommendations concerning 'fire risks') need not apply, provided that either:

(1) the net floor area of the dwellings above the first floor does not exceed 380 m² (approximately 4080 ft²) and all the entrance doors are separated from the stairway on all floors (other than the topmost entrance floor) by a lobby which need not be ventilated (see Fig. 19); or

(2) the net floor area of the dwellings above the first floor does not exceed 720 m² (approximately 7750 ft²) and all the entrance doors are separated from the stairway by a lobby adjoining an external wall, with a permanent opening or openable window or equivalent ventilation in the external wall of not less than 1.5 m² (approximately 15 ft²) (see Fig. 20). [2.4.2.5]

3.4.3.4 The recommendation given in 3.4.3.3 may also apply to the lower four storeys of a higher building provided that egress from the storeys at and above the fifth storey to the ground storey is provided separately from that from the lower storeys. [2.4.2.5]

3.4.4 Multi-stairway condition. Where all dwellings in a building have access to more than one main stairway, one of the main stairways should terminate at ground level but another may be continued to a basement provided that the basement is cut off from the stairway by two Type 1 doors, one of which, at least, is at ground level. The space between these two doors should have an openable window or other means of ventilation to the open air through an opening not less than 1.0 m² (approximately 10 ft²). [2.4.5.9]

3.4.5 Stairways without permanent ventilation. Stairways on external walls without permanent ventilation should have openable windows at each storey height. Advice on the types and location of windows may be obtained from the Building Regulation Authority and the Fire Authority (see also 3,3.3.3).

3.4.6 Ventilation to internal stairways. Where a main stairway enclosure is not situated against an external wall, or has no opening windows, it should have a permanent vent at the top having a free area of not less than 1.0 m² (approximately 10 ft²) [2.4.4]

4. CONSTRUCTION

4.1 GENERAL

In Great Britain the Building Standards (Scotland) Regulations 1963, and the Building Regulations 1965, control many parts of the structure of a building which would affect the safety of persons escaping from a fire. Means of escape, as such, are not controlled in the Buiiding Regulations 1965, but the Building Standards (Scotland) Regulations 1963 do include means of escape, as do the London Building Acts operative in the Inner London Boroughs. Standards of fire resistance for certain elements of structure, provisions of protected shafts (including enclosed stairways) and control of surface finishes are included in all this legislation and, in order to avoid confusion, no recommendations regarding these matters have been made in this section unless the standards recommended are additional to statutory requirements.

4.2 FIRE PROTECTION

4.2.1 All dwellings. It is essential that elements of structure which do not inherently possess the necessary fire resistance should be protected. A wide variety of methods are available in the forms of protective coverings, casings or membranes to columns, walls or floors. In this connection, when selecting a material, designers should consider the effects of:

(1) mechanical damage;
(2) ageing of material;
(3) maintenance requirements;
(4) temporary removal for repairs and alterations.

Some form of protection to structural members may suffer the disadvantage that weakness may occur at joints by virtue of the method of fixing and care should be taken to eliminate the continuity of cavities between adjacent elements. In the case of suspended ceilings, a further weakness may occur by the introduction of recessed lighting fittings, ventilation ducts or other services which necessitate the provision of access panels and, by so doing, create a potential weakness in the protective value of the fire resisting membrane.

When applied protection is used, the detailed designs of the joints (and their proper execution on the site) are of special importance since cracks are most likely to occur in these positions, either through shrinkage, settlement or deflection, in the normal life of the building, or through thermal expansion in the course of a fire.

Reference should be made to CP ...., 'Suspended ceilings and linings of dry construction using metal fixing systems'*, as well as any relevant regulations and byelaws.

4.2.2 Dwellings above 15 m (approximately 50 ft). Protection of structural members by systems that consist entirely of dry joints is not recommended. Protection of several elements of structure by means of a continuous membrane should not be used in any circumstances. If hollow protection takes the form of the encasement of individual elements of structure by a membrane (e.g. plaster on expanded metal), the cavities which result should not pass through any floor or wall.

4.2.3 Partitions and screens. Where non-load bearing partitions and screens are recommended to have a period of half-an-hour or more fire resistance, they should extend to form a tight seal with the soffit of the structural floor above, or with a false ceiling of the same fire resisting standard, and with adjoining walls or columns and floor. Alternatively, where relative movement between the partition or screen and the adjoining members is to be accommodated, edge isolation joints should not exceed 13 mm in width and should be (subject to the degree of protection required) tightly packed with rock wool or glass fibre.

4.3 FIRE RESISTING DOORS

4.3.1 General. Fire resisting doors are one of the most important links in the chain of fire safety precautions and care in their selection, to ensure that they are adequate for their purpose, cannot be over emphasized. Doors used for fire protection purposes should be self-closing and should, except for entrance doors to dwellings and doors within them, be marked with a warning notice that they are provided for fire safety and should be kept closed. Self-closing devices should be of a type which cannot readily be disconnected or immobilized and should not embody a check retaining action at 90°, and it is essential that a self-closing device of any kind should override any latches fitted to the door or doors. Self-closing devices are particularly important in both double and single swing doors, as the efficiency of doors as a barrier to fire can be negated if the device does not retain the door positively in the closed position.

Fire resisting doors occurring in spaces in common use (other than in dwellings) should be fitted with door closers or spring hinges; rising butt hinges are not considered satisfactory in these situations. Hinges and closers should be check action. Hinges should satisfy BS 1227, provided the melting point of the metal is not less than 800°C. No hinges should have nylon bushes. *As amended Jan, 1973*

In all cases, the tests referred to under 4.3.2 are those laid down in BS 476.

4.3.2 Types of fire resisting doors. The types of fire resisting doors numbered 1, 2 and 3 correspond to the recommendations of CP 3, Chapter IV, Parts 2 and 3. Type 4 is a further type recommended in this Code for places where glazed doors are recommended across corridors.

* In course of preparation.

4.3.2.1 *Type 1* door. The door, when fitted in its frame, should satisfy the requirements of test as to both freedom from collapse and resistance to passage of flame for the relevant period of fire resistance either prescribed in the Building Regulations or recommended in this Code. Such doors should be fitted with an automatic self-closing device (other than a rising butt) except in the case of a door such as that described in 5.5(1).

4.3.2.2 *Type 2 door.* The door, or each leaf thereof, when fixed in a frame with a 25 mm rebate (approximately 1 in), should satisfy the requirements of test as to both freedom from collapse and resistance to passage of flame for not less than 30 minutes. [4.4.3]

The door may be single or double leaf, swinging in one or both directions.

Such doors should be fitted with a self-closing device (other than a rising butt) and the frame may have either no rebate or a rebate of unspecified depth; meeting stiles should not be rebated.

With any doors fitted in frames without rebates, tbe clearance between leaf and frame, or leaf and leaf, should be as small as is reasonably practicable.

4.3.2.3 *Type 3 door.* The door, or each leaf thereof, when fitted in a 25 mm (approximately 1 in) rebated frame, should satisfy the requirements of test as to freedom from collapse for not less than 30 minutes and resistance to passage of flame for not less than 20 minutes.

The door should be either a single leaf swinging in one direction only, or double leaf with each leaf swinging in the opposite direction from the other leaf, and with rebated meeting stiles.

The door should be fitted in frames having a rebate of not less than 12 mm (approximately ½ in) and should be fitted with an automatic self-closing device which may (except where otherwise recommended) consist of rising butt hinges.

4.3.2.4 *Type 4 door.* The door, or each leaf thereof, when in a 25 mm (approximately 1 in) rebated frame, should satisfy the requirements of test as to freedom from collapse for not less than 30 minutes and resistance to passage of flame for not less than 20 minutes.

The door may be single or double leaf, swinging in one or both directions.

Such doors should be fitted with a self-closing device (other than a rising butt), and the frame may have clther no rebate or a rebate of unspecified depth.

4.3.2.5 *Glazing.* Doors having half-an-hour fire resistance or one hour fire rating may incorporate fixed glazing so long as the fire resistance in respect of integrity and stability is maintained. For particulars of fire resistance glazing, sec CP 153:Part 4.

As amended February 1976

4.4 STAIRWAY ENCLOSURE: STAIRWAY PROTECTION LOBBIES

The Building Regulations require certain stairways to be enclosed and state the degree of fire-resistance required.

Stairway enclosure sbould be planned so that where a door opens into the enclosure, clear passage of 900 mm (approximately 3 ft) is unobstructed by the swing of the door.

4.4.1 Main stairways. Where stairways are enclosed only to meet the recommendations of this Code, the fire resistance of the intemal enclosing walls should be not less than that required by the Building Regulations for the elements of structure of the building.

4.4.2 Private escape stairways. Any wall which separates a private escape stairway of the type described in 3.3.3.1 from any part of the dwelling which it serves should have a fire resistance of nòt less than half-an-hour. If the wall separates the stairway from any other space, it should have a fire resistance of not less than one hour. If the stairway separates one flat or maisonette from another, the stairway enclosure should have a fire resistance equivalent to one hour or more.

4.4.3 Doors. Access to main stairways (other than by those means described in 3.4.3.3(1) should be gained through Type 2 doors placed in the enclosing walls of the stairways. Access to private escape stairways of the type described in 3.3.3.1, access to exit doors from such stairways on to common circulation spaces, and

access to subsidiary stairways and certain other stairways (see 3.4.3.3(1)) should be gained through Type 3 doors.

4.4.4 Glazing to stairways. There should be no glazing or glass bricks in any internal enclosing wall of a stairway in single stairway buildings or in any internal enclosing wall of a stairway requiring more than one hour fire resistance in multi-storey buildings. Because of the danger from radiated heat, the amount of fire resisting glazing should be limited to the minimum possible (see CP 153 : Part 4). In no case should glazing be taken below handrail level. *As amended February 1976*

4.5 REFUSE CHUTES

Refuse chutes should conform to CP 306. The enclosing structure should be of non-combustible materials and should have a fire resistance of not less than one hour or that period required by the Building Regulations for the elements of structure of the building, whichever is the greater.

Refuse chute access hoppers should not be in any stairway enclosure or corridor, nor in a stairway protection lobby.

Refuse chute enclosures should be ventilated to the open air.

5. ANCILLARY ACCOMMODATION

5.1 GENERAL

Ancillary accommodation in which a fire may occur (such as that described in the following clauses) should not open directly out of any part of an escape route that provides the only means of escape from any dwelling, or out of a main stairway (except as provided for in 5.2).

5.2 RECEPTION AREAS, PORTER'S OFFICES, AND SIMILAR SPACES

Provision may be made in a common entrance hall containing a main stairway and not forming part of the only escape route from any dwelling, for a reception area with a desk and a few chairs. If an office is required, it should be separated from the entrance hall by a fire resisting wall or screen containing a Type 1 door which may be opened into the entrance hall via a lobby with Type 2 doors.

5.3 CUPBOARDS AND STORE ROOMS

Rooms entered from a common circulation space which does not form the sole route of escape, and used for the accommodation of clothes/drying cabinets, perambulators, cleaning materials, service intakes etc., should be enclosed with walls and floors of not less than one hour fire resistance, with access through a Type 1 door (half-an-hour). The door should be self-closing or be fitted with a lock and marked 'KEEP LOCKED'.

5.4 TRANSFORMER AND SUB-STATION CHAMBERS

Any chamber forming part of a block of flats or maisonettes should be located against an external wall and should be entered only from outside the building. Any floor or wall which separates a chamber from the remainder of the building, and any beam or stanchion situated within the chamber, should be of non-combustible construction and have a fire resistance of not less than two hours. Where any oil immersed gear is located within a chamber, a retaining sill should be provided around the gear or at the door threshold.

5.5 CENTRAL BOILER ROOMS

Whatever the fuel used, boiler rooms and associated fuel storage spaces should be separated from the remainder of the building by walls and floors of non-combustible construction having a fire resistance of not less than two hours. It is desirable that access to the boiler rooms and fuel stores should be from outside the building only and away from other exits from the main building.

Where internal communication with the rest of the building is required, the following precautions should be taken:

(1) Any doors between the boiler room and the remainder of the building should be Type 1 and have a fire resistance of two hours. The doors should preferably be fitted with a lock and marked ' KEEP LOCKED ', or they should be self-closing by a means appropriate to a Type 1 door.

(2) Adequate provision should be made for combustion air and for ventilation in the boiler room, to ensure that doors (internal or external) will not need to be opened at any time for the purpose of supplementing the air supply.

(3) The doors should not open into storage accommodation.

(4) The doors should not open on to any place where the discharge of smoke or hot gases would be likely to obstruct any escape route.

Recommendations for fire precautions in oil fired boiler rooms and associated oil storage, including means of escape within boiler rooms, are contained in CP 3002 and BS 799.

Gas-fired installations should be installed in accordance with the recommendations of CP 332, Part 2 or Part 3.

In the design of the boiler room, the possibility of a future change to other fuels should be considered at the design stage of the building.

Where it is desired to locate an oil-fired boiler chamber on the roof or within the topmost storey of a building, special consideration will be required having regard to its siting, the risks involved, its proximity to other buildings or parts of the same building and its separation from the remainder of the building. Where these are considered to be satisfactory, the main oil storage tank should be sited at ground level in the open air, and a service tank not exceeding 910 litres (approximately 200 gallons) in capacity should be sited on the roof of the building; the service tank may be adjacent to the boiler chamber provided it is separated from it and is totally enclosed, with non-combustible construction having a standard of fire resistance of not less than four hours. The supply pipe between the main storage chamber and the service tank should be within its own non-combustible duct having a similar period of fire resistance. Arrangements should be made to ensure that, in the event of an outbreak of fire in the boiler chamber or service tank room, all the oil in the service tank is automatically drained back to the main storage tank at ground level.

5.6 FUEL STORAGE

Solid fuel should be stored in bunkers protected by non-combustible walls of sufficient thickness to prevent heating of the fuel from boilers or steam pipes. Different fuels should be stored in separate chambers. Adequate ventilation should be provided to the fuel tanks for the bulk storage of oil and to the compartment in which they are placed. Adequate facilities should also be provided for retaining the oil within the tank chamber should leaks develop in the tanks.

Reference should be made to CP 3002.

5.7 CAR PARKS AND GARAGES

Large garages and car parks, i.e. those exceeding 465 m^2 (approximately 5000 ft^2), and any storage of petrol would require the issue of a licence from the Local Authority under the Petroleum Acts*. The Local Authority would specify requirements for the safe storage of petrol, for the reduction of fire risk within the garage and for the prevention of fire spread between the garage and the building.

Whether or not a licence is necessary, car parks or garages associated with blocks of dwellings should be separated from the main building by construction having at least one hour's fire resistance. Garages should not connect (even via a lobby) to a single stairway building. If access between the garage and multi-storey building is essential, it should be so arranged (by means of Type 1 doors and stairway protection lobbies) that fire would not penetrate to the main building nor smoke jeopardize any escape route. External openings from garages and the site of any part of the petrol installation should be so arranged that any final exit from the main building would not be in danger.

* Petroleum (Regulation) Acts 1928 and 1936.

6. ENGINEERING SERVICES

6.1 STAIRWAY AND CORRIDOR LIGHTING

Adequate artificial light should be provided in all stairways and in corridors forming part of escape routes. Stairway and corridor lights should be supplied by ' protected circuits ' (i.e. sub-main circuits) exclusive to the stairway and corridor lighting and restricted to routes of negligible fire risk. Stairways should be illuminated by a circuit direct from the main switchboard with switches on each landing capable of overriding the automatic time control and switching the lighting on, but incapable of switching the lighting off. Where a stairway has no natural lighting its lighting circuit should be independent of the corridor lighting.

6.2 GAS AND ELECTRICITY SERVICES

Gas and electricity services should be contained within separate service ducts.

Ducts containing gas services should have a minimum fire resistance of half-an-hour and should not be fire-stopped at floor levels but should be ventilated at the top and bottom to the open air. Any doors for inspection or access should, in conjunction with their frames, have a fire resistance of half-an-hour.

Ducts containing electricity services should be either a continuous fire resisting duct or fire-stopped at each floor.

Electrical installations should be installed in accordance with the current ' Regulations for the electrical equipment of buildings '.*

Gas meters and associated equipment should be installed in accordance with CP 331, Part 2.

Gas and electricity meters should preferably not be located in the entrance hall of a dwelling, but if a meter(s) is so positioned it should be contained within a suitably constructed non-combustible cupboard.

The position of meters should be agreed with the supply authority at the planning stage. Where meter boxes are required, gas meters and electricity meters should be housed in separate boxes, each large enough only for the meter and associated equipment. In the case of electricity, this may include a second meter, a service cut-out and a time-switch.

To facilitate meter reading and attendance from outside dwellings, the meters may be accessible or visible from a common circulation space through strong doors provided with locks. When required, glazed viewing panels large enough to expose dials and meter number may be provided. If meters are inset in any wall or partition they should be separated from any accommodation at the back and sides by non-combustible construction having the same fire resistance and insulation as that recommended for the element in which they are placed.

6.3 HEATING OF INDIVIDUAL DWELLINGS

Space heating by town gas should conform with CP 332, Parts 1, 2 and 4.

Individual oil-fired boilers should be designed and installed in accordance with CP 3002. There is no British Standard for oil-burning ducted warm air systems, but hazards associated with the fuel may be mitigated by means similar to those for oil-fired boilers. Briefly, these are intended to restrict the flow of leaking oil and to provide ready means for cutting off oil by manual or automatic control.

Where a ducted heating or air conditioning system is installed (irrespective of fuel) it should be so designed that it would not cause spread of smoke or fire (whether by forced convection, natural convection or fire-induced convection) from rooms to circulation spaces or from living rooms to bedrooms†.

6.4 MECHANICAL VENTILATION: PUBLIC AREAS

Where a ducted ventilation or air conditioning system is installed it should be so designed that smoke or fire will not be carried to places where it would jeopardize escape.

One form of ventilation which may be acceptable, in certain cases, is pressurization. This is an air control system which mechanically maintains a positive air pressure within Stage II and Stage III escape routes with the objective of preventing smoke entering into them,

* ' Regulations for the Electrical Equipment of Buildings ', Issued by the Institution of Electrical Engineers.
† Ducted warm air heating systems are currently under critical consideration.

Care should be taken in siting plant rooms and air intakes to ensure that there could be no induction of smoke from an adjacent fire. Means of controlling the system of ventilation should be provided for the fire brigade from a suitable access point.

Where windows are sealed for air-conditioning or pressurization purposes, a proportion of such windows should be capable of being opened by firemen for ventilation purposes. The local fire brigade should be consulted as to the most suitable means of emergency opening of windows.

6.5 LIFT ENCLOSURES AND MACHINE ROOMS

Lift enclosures and machine rooms should conform with BS 2655 and CP 407.101 (see also 7.6).

Lift machine rooms should preferably be sited at the top of the lift shaft and should always be so sited if the lifts open out of a common approach route or stairway that provides the only means of escape from a dwelling.

7. FIRE BRIGADE FACILITIES AND FIRE ALARMS

7.1 ACCESS FOR FIRE APPLIANCES

7.1.1 Buildings fitted with dry risers. Buildings with any storey higher than 18 m (approximately 60 ft) should be fitted with ' dry ' rising mains.

Buildings with dry rising mains should have access roads for fire appliances to within 18 m (approximately 60 ft) of the inlet to the main and within sight of the inlet.

NOTE. Savings in the extra provision of access roads for fire appliances that would otherwise be required, and the consequent improvements to the space around buildings, may often be achieved by also fitting dry rising mains to buildings with floor heights up to 18 m (approximately 60 ft).

7.1.2 Buildings fitted with wet risers, Where any floor of a building is higher than 60 m (approximately 200 ft) the building should be fitted with ' wet ' rising mains.

Buildings with wet rising mains should have access roads to within 18 m (approximately 60 ft) of the ground floor access point of the stairway enclosure in which each main is situated (or, if the main is not situated in a stairway enclosure, to within 18 m (approximately 60 ft) of the foot of the nearest enclosed stairway to that main) and within sight of the building.

7.1.3 Access roads or ways, Access roads may be common highways, private roads, footpaths or specially strengthened and defined routes through the surrounding terrain and should have a minimum width of 3.6 m (approximately 12 ft) and be capable of carrying a pumping appliance with a laden weight of 10.1605 tonnes (approximately 10 tons). Any necessary bends in roads should be able to accommodate an appliance having a minimum turning circle of 17 m (approximately 55 ft) diameter. Minimum clearance height should be 3.6 m (approximately 12 ft) and any gates should have a width of 3 m (approximately 10 ft) in the clear and be openable from either side.

7.1.4 Buildings not fitted with wet or dry rising mains, Where buildings are not fitted with wet or dry rising mains (whatever their volume) and have all floor levels under 9 m (approximately 30 ft) above ground level, access roads should be provided so that fire appliances may approach within 45 m (approximately 150 ft) *of any point* within any maisonette. The measurement to the front door of any dwelling should be along the ground, path or pavement from the approach point and up the centre of the nearest main stairway, on the assumption that a hose will lie on the centre line of the flight and along the horizontal access route from the head of the stairway (access requirements as given in 7.1.3). Where such buildings have floors higher than 9 m (approximately 30 ft) but not higher than 18 m (approximately 60 ft) from ground level on any side and are not fitted with wet or dry risers, access roads should be provided for turntable ladders or hydraulic platforms as the case may be, along the face of a perimeter wall or walls of the building from which there is access into the interior of the building, in accordance with Home Office Fire Prevention Note No. 1/1970* (see 7.1.1).

* Home Office Fire Prevention Note No. 1/1970, ' Access for fire appliances '.

7.1.5 Names and numbers of blocks should be clearly legible from the main access roadway.

7.2 EXTERNAL HYDRANTS

Fire hydrants should be provided within the confines of the site if necessary, in consultation with the local fire and water authorities.

7.3 INTERNAL HYDRANTS

7.3.1 General. Instantaneous female outlets conforming with BS 336 should be provided off wet or dry rising mains on each storey above the first. They should be in a ventilated lobby, where provided, or otherwise in a stairway entrance. Subject to agreement with the Fire Authority, in certain deck access schemes outlets may be free-standing on an open deck.

Outlets may be placed in a glazed cupboard clearly marked ' FIRE BRIGADE WET MAIN OUTLET ' or ' FIRE BRIGADE DRY MAIN OUTLET ', as the case may be. An outlet should be provided on the roof or at the highest outlet level in the building for testing purposes and adequate allowance made for drainage. To aid fire fighting, a simple, single cable and plug telephone system with specified connection points on each floor (usually by the wet or dry mains outlet) and in any lift motor room should be provided to enable the fire service to communicate between the ground floor and any other floor in the building. Wet and/or dry mains outlets should be so placed that *all* parts *of the building* are within 60 m (approximately 200 ft) measured along the line on which hoses will be laid. If this distance cannot be achieved with one rising main, additional main(s) should be provided. An air release valve should be provided at the top of each dry rising main, discharging to open air.

7.3.2 Dry rising mains. Dry rising mains should have a diameter of not less than 100 mm (approximately 4 in) and should be provided with two instantaneous male inlets conforming to BS 336 for fire brigade connections. The inlets should be sited at a convenient position on the external wall of the building about 760 mm (approximately 2 ft 6 in) above ground level and should not be more than 12 m (approximately 40 ft) distant from the vertical run of the rising main. Inlets should, under all circumstances, be electrically earthed and should be contained in a glass fronted box, complying with BS 3980. *As altered Jan., 1972*

7.3.3 Wet rising mains. Wet rising mains should comply with the following conditions:

(1) A minimum running pressure of 0.41 N/mm² (approximately 60 lbf/in²) but not more than 0.52 N/mm² (approximately 75 lbf/in²) should be maintained at each outlet when the three outlets are fully opened.

Arrangements should, moreover, be made so that the static pressure in any length of hose connected to the outlet does not, when the water is shut off at the nozzle, exceed 0.69 N/mm² (approximately 100 lbf/iu²) in order to reduce the risk of a hose bursting.

(2) Each main should be capable of providing a flow of water of at least 1365 l/min (approximately 300 gal/min), i.e. sufficient to serve three lines of hose, and should be fed from a suction tank or tanks having a total capacity of either 45 000 litres (approximately 10 000 gal) or 11 400 litres (approximately 2500 gal).

The suction tank or tanks should be automatically supplied from a towns main at a rate in the case of the 45 500 litres (approximately 10 000 gal) tanks, of 445 l/min (approximately 100 gal/min) and in the case of the 11 400 litres (approximately 2500 gal) tanks, of 1600 l/min (approximately 350 gal/mia).

The supply should be independent of any connection from which an automatic sprinkler installation is fed.

Tanks supplying domestic water should not be used as suction tanks for wet rising mains unless arrangements have been made to draw off domestic water in such a manner that the requisite reserve of water for the rising main is always preserved.

(3) The rising main should be fitted with two booster pumps, one of which should act as standby, each being supplied by a different source of power (e.g. electricity or diesel engine) and arranged to operate automatically (i.e. on a flow of water or a fall of water pressure in the installation). The secondary pump should be so arranged that it will operate automatically on a failure (for any reason) of the primary pump.

Both pumps should be primed by the water levels in the suction tank or tanks.

(4) If suitable independent electricity supplies are available, the prime movers for the pumps may be electric motors. Where two distinctly independent supplies are not available (e.g. where there is only one local electric main) one of the prime movers should be a diesel engine designed specifically for fire pump use.

(5) In addition to automatic starting, all pumps should be capable of being started or stopped manually, unless there is also fitted a time/demand switch which will operate automatically.

(6) An audible and visual alarm should be provided to indicate that the equipment and pumping plant have operated. Arrangements for the draining of the rising main should also be incorporated.

(7) Attention is drawn to the importance of ensuring that from the time the wet rising main is first connected to a supply the running pressure at each outlet does not exceed 0.52 N/mm² (approximately 75 lbf/in²). If this is impracticable for any special reason, a notice should be attached to each outlet to read 'HIGH PRESSURE MAIN: OPEN VALVE SLIGHTLY UNTIL SUFFICIENT PRESSURE IS OBTAINED'. These notices should remain on the outlets until the pressure at the outlets is reduced to 0.52 N/mm² (approximately 75 lbf/in²).

7.4 BUILDINGS UNDER CONSTRUCTION, OVER 30 m (APPROXIMATELY 100 ft) IN HEIGHT

Whilst a building is in course of erection, special difficulties could arise in fighting a fire. Unless special provision for water supplies for fire fighting is made, it is quite possible for a fire to reach serious proportions, with possible damage to the structure. The installation of a rising main, as recommended in 7.3, should be phased to come into operation as the construction of the building proceeds. The riser should be extended and brought into operation as each successive floor Is completed, from ground floor upwards. It may be left dry up to approximately 61.0 m (approximately 200 ft) during construction, with an inlet at ground level.

7.5 HYDRAULIC HOSE REELS

It is generally considered that hydraulic hose reels cannot be justified in the interests of safety of life alone. The provision of such reels will, however, facilitate the work of the fire brigade and may result in reducing fire and water damage.

7.6 FIRE LIFTS

7.6.1 Where passenger lifts are installed in a building, one or more should be arranged so as to be available for the exclusive use of firemen in an emergency by providing at entrance level a switch in a glass-fronted box marked 'FIRE SWITCH' which operates a control whereby firemen can obtain the use of a lift without interference from the landing call points. Alternatively, the fire switch may be in a box protected by a metal cover and which can be unlocked by a key which would pass the dry riser box and any other locks which would require to be opened by the fire brigade. The design and type of switch for use with fire lifts should conform to the requirements of the local Fire Authority.

7.6.2 A sufficient number of lifts should be arranged as fire lifts to ensure that in flats every floor (except, under the circumstances described below, the top floor) and in maisonettes every entrance floor, has direct access to at least one such lift.

The location of a fire lift on plan is dependent upon the method of smoke control used.

7.6.3 Where smoke containment is the method of smoke control adopted for a building a fire lift should not be more than about 4.5 m (approximately 15 ft) from a main stairway if that is the only stairway to which there is access, or about 15 m (approximately 50 ft) is there is another stairway on the same floor to which there is access. In addition, if a fire lift is not in a main stairway enclosure, or within 4.5 m (approximately 15 ft) of a door in a main stairway enclosure, it should be within 4.5 m (approximately 15 ft) of a Type 4 door across a corridor that leads to a main stairway,

In order to ease the difficulty of accommodating the space necessary for over-run at the top of the shaft for a high speed lift, it is considered that a fire lift need not serve the top floor of a building provided that the

lift is not more than 4.5 m (approximately 15 ft) from a main stairway on the floor below, the hydrant outlet on the top floor is within the stairway enclosure or in a ventilated lobby adjoining the stairway and the number of flats on the top floor does not exceed eight.

7.6.4 Where smoke dispersal is the method of smoke control adopted for a building a fire lift should not be more than about 10 m (approximately 33 ft) from a main stairway, if that is the only stairway to which there is access. However, there is no travel distance restriction between a fire lift and a main stairway where access is available from the fire lift in two directions to one or more main stairways.

In order to ease the difficulty of accommodating the space necessary for over-run at the top of the shaft for a high speed lift, it is considered that a fire lift need not serve the top floor of a building provided the lift is not more than 10 m (approximately 33 ft) from a main stairway (if that is the only stairway) on the floor below and the hydrant outlet on the top floor is within the stairway enclosure or a special ventilated lobby provided for the purpose, and provided the number of flats on the top floor does not exceed eight.

7.6.5 A fire lift should have a platform area of not less than 1.5 m^2 (approximately 15 ft^2) and be capable of carrying a load of 550 kg (approximately 1200 lb). Its speed should be such that it can reach the top floor from ground level within one minute. The electric supply to any fire lift should be provided by a sub-main circuit exclusive to the lift, except that where the fire lift is one of a battery of not more than six lifts (whether fire lifts or not) the other lifts may be fed from the same supply. The cables supplying current to the lift motor should pass through routes of negligible fire risk. Reference should also be made to BS 2655, Part 1.

7.7 FIRE ALARMS

Reasonable means for calling the fire brigade should be provided. It is recommended that the Post Office Corporation should be approached at an early stage with a view to providing at least one public telephone within the block or a call box at no greater distance away than 300 m (approximately 960 ft).

7.8 ASSISTANCE TO THE FIRE SERVICE

It is essential that the fire service should be able to locate, without delay, any individual flat or maisonette to which they are called. A notice or map should be located at the entrance to each fire service access road to an estate, clearly indicating the location of individual blocks of dwellings, and a notice should also be provided at the entrance to each block indicating the sequence of numbering and the layout of dwellings at each floor.

8. ADVICE TO OWNERS AND OCCUPIERS

8.1 GENERAL

Throughout this Code, reference is made to various recommendations with regard to fire safety which inevitably depends to a large extent for their effectiveness upon the co-operation of the owners and occupiers. They should be able to understand the reasons for certain principles of design and construction and be willing to ensure that protection devices are well maintained and properly operated. In earlier sections of this Code reference is made to the fact that the building should be designed in such a way that there is no undue risk of any of the occupants being trapped by fire or smoke in any part of the building. This inevitably depends, to a greater or lesser extent, not only upon fire resisting doors being closed (and not wedged open, which is so often the case) and upon the good condition of self-closing door mechanisms, but also upon any automatic detection device and openable ventilator or window being frequently inspected to ensure that they are all fully operative.

The crux of the whole problem, however, is that of fire prevention and there is special need to impress upon owners and occupiers certain elementary rules and principles. It is recommended, therefore, that advice should be prepared for the benefit of owners and occupiers and distributed in rate demands, rent books, etc., and also posted in the form of prominent notices at appropriate points throughout the building (e.g. by lifts at each floor level).

As amended Aug. 1978

8.2 FORM OF ADVICE TO OWNERS AND OCCUPIERS OF FLATS CONSTRUCTED TO THIS CODE OF PRACTICE

A suggested form of advice to owners and occupiers is given below. The form of advice refers only to specific items as they relate to flats and maisonettes and does not attempt to deal with general fire precautions. If local authorities, other housing agencies, and owners feel that more extensive advice on fire precautions should be made available, this information can be obtained from the fire authority.

'This building has been designed and constructed to provide adequate safety for all its occupants in the event of fire. It is important to remember, however, that if a fire breaks out in your dwelling your safety will depend upon your ability to leave by the front door (unless the dwelling is provided with another route to safety). The following instructions are therefore **VERY IMPORTANT.**

AT ALL TIMES

Keep the passages and hall clear of obstructions, particularly of combustible goods and any form of 'naked flame' heating.

Use the rooms only for the purpose for which they were intended, e.g. sleeping, cooking, etc., not for storage or as workshops.

IF A FIRE BREAKS OUT IN YOUR DWELLING

1. Leave the affected room at once, together with any other occupants, and close the door.
2. Do not stay behind to put out the fire unless you are sure you can do so safely.
3. Alert occupants of other rooms in the dwelling.
4. Leave the dwelling, closing the front door, and give the alarm (see below). Use the stairs, not the lift. Balconies should not be used unless they form part of an escape route.

IF A FIRE IS EVIDENT OR REPORTED ELSEWHERE

You will normally be safe to stay within your flat. You should close doors and windows, but in the unlikely event of smoke or heat entering the flat before you are able to do so, leave at once closing the doors behind you.

You may have confidence that you will be safe if this is done and it is your responsibility to other occupiers to do so.

Sources of fire. Most fires in flats are caused by carelessness or misuse of appliances, usually by one or more of the following.

Careless use of matches and smoking materials.
Careless use of cooking appliances.
Airing of clothes and other combustible materials close to sources of heat such as radiant, storage and convector heaters.
Absence of adequate fire guards.
Children playing with fire.
Defective and inadequate servicing of domestic applicances, including electric blankets.
Use and siting of portable heaters close to furniture and curtains.
Failure to disconnect radio, television sets and other electrical appliances at night, or when away from home.
Unsafe siting or misuse of paraffin heaters (see paragraph below).
Covering of storage and convector heaters, thus restricting the necessary free circulation of air.

Use of portable heaters. The entrace lobby and corridor of a flat or maisonette is the normal escape route in the event of fire and it is therefore most important that portable heaters are not sited in these areas. All types of portable boaters can constitute a fire risk if they are not used correctly and maintained in good working order. Manufacturers' instructions should always be followed. *As amended Aug. 1978*

Paraffin heaters should be positioned so that they cannot be knocked over or be subject to draughts, and never filled or carried whilst alight. Special care should be taken in the use of portable heaters using bottled gas particularly when changing gas cylinders.

Fire-resisting, self-closing doors. Fire resisting, self-closing doors can be found in most parts of this building including the entrance doors to all flats and maisonettes and doors to stairways and corridors, and in most rooms in each flat or maisonette. These doors are provided to arrest the spread of fire and smoke and THEY MUST BE KEPT CLOSED.

Make sure that the self-closing mechanisms on doors in your dwelling are effective at all times; if not, report any defects to the porter, caretaker, landlord, or to your local Housing Authority.

Before retiring, or when leaving the dwelling unoccupied, close and latch as many doors in your home as is practicable as this will help to prevent the spread of fire.

Abuse of fire-fighting equipment. Fire fighting equipment (inthe form of fire mains and outlets) is installed in this building. Make it your business to see that such equipment is not interfered with. If you find it apparently damaged, please report this immediately.

Access roads. It is important that fire service access roads to blocks of dwellings should be kept clear and unobstructed to allow access of the fire brigade aad other emergency vehicles at all times.

IN THE EVENT OF A FIRE, HOWEVER SMALL, CALL THE FIRE BRIGADE IMMEDIATELY, as follows:

(insert calling procedure).'

APPENDIX A

KEY TO THE FIGURES

OV = OPENABLE VENTILATOR (WINDOW, ETC.)
AOV = AUTOMATICALLY OPENED VENTILATOR (WINDOW, ETC.)
PV = PERMANENT VENTILATION (WINDOW, ETC.)
SW = STAIRWAY
L = LOBBY
C = CORRIDOR
EH = ENTRANCE HALL TO A FLAT
 = A FIRE IN A DWELLING
T.2 = TYPE 2 DOOR
T.3 = TYPE 3 DOOR
T.4 = TYPE 4 DOOR

NOTE 1. Those figures which illustrate travel distances show the maximum travel distance limitations.
NOTE 2. The figures are intended only to clarify points made in the text. It should not be assumed that these plans are more satisfactory than others which may be devised.

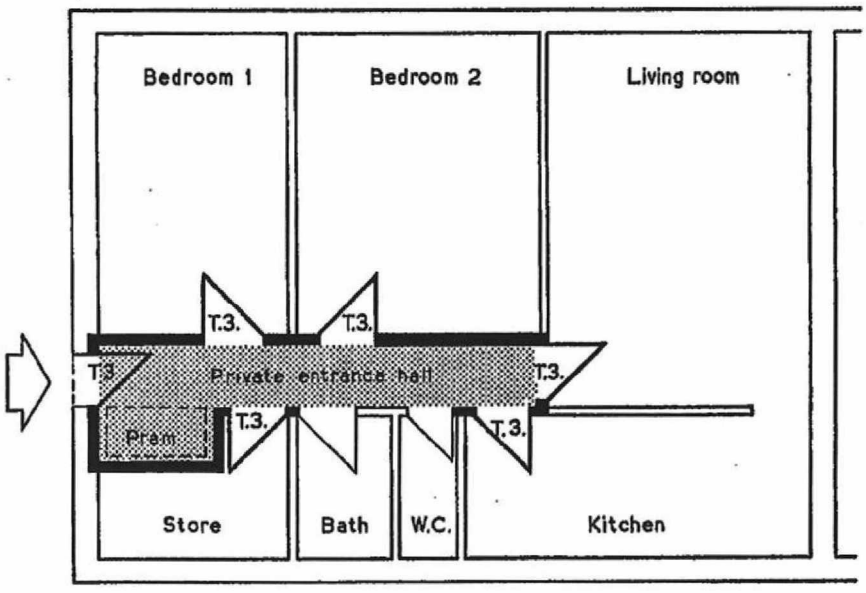


Fig. 1. Conventional flat plan

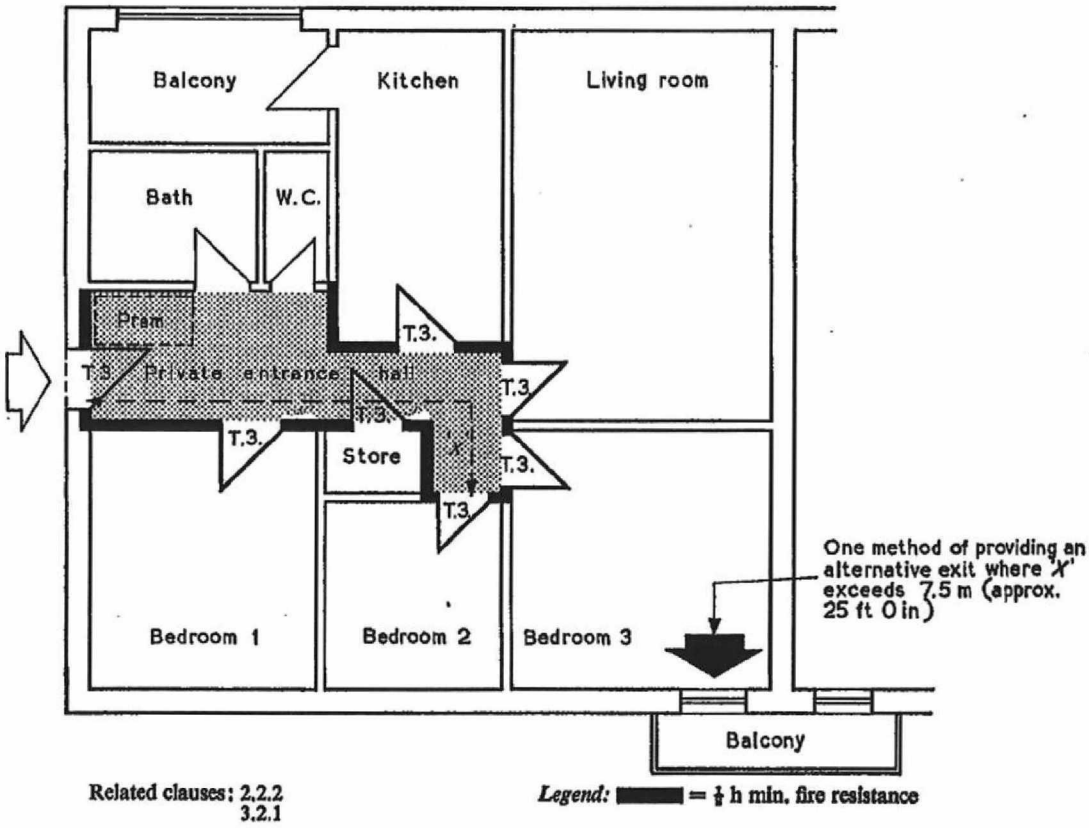
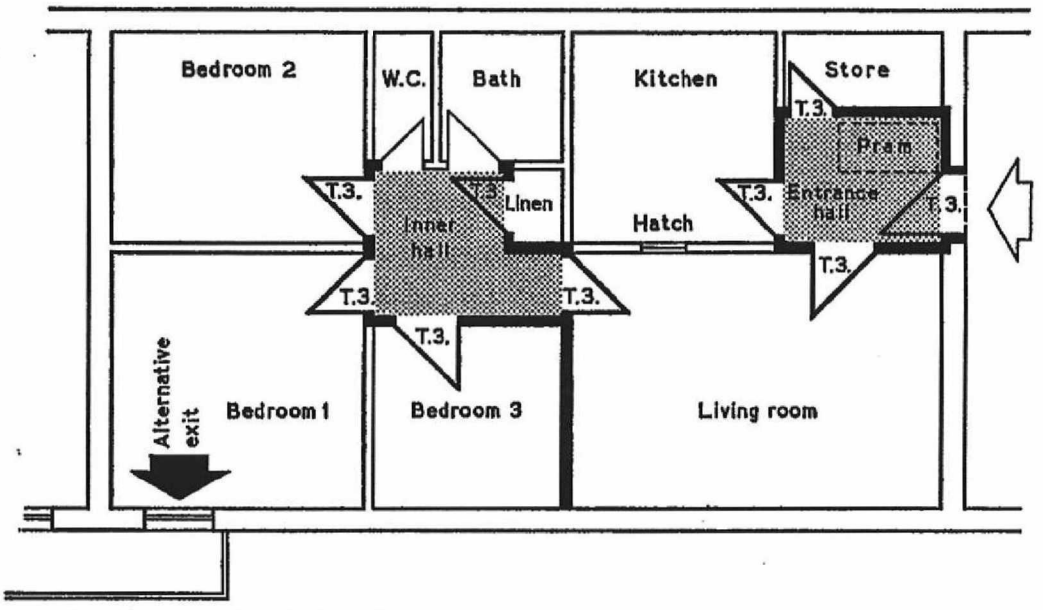


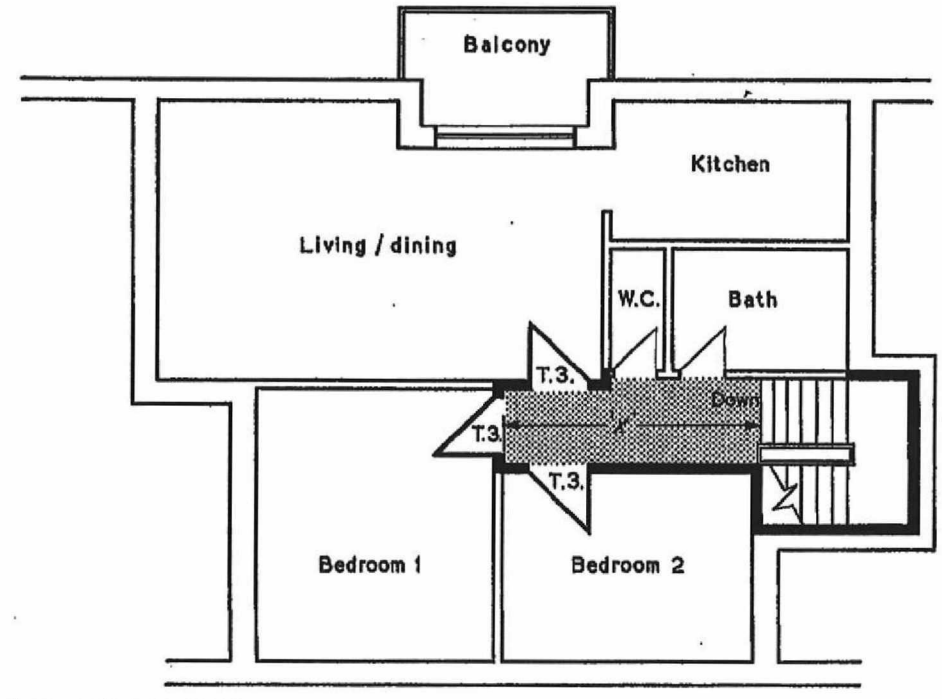
Fig. 2. Larger flat plan



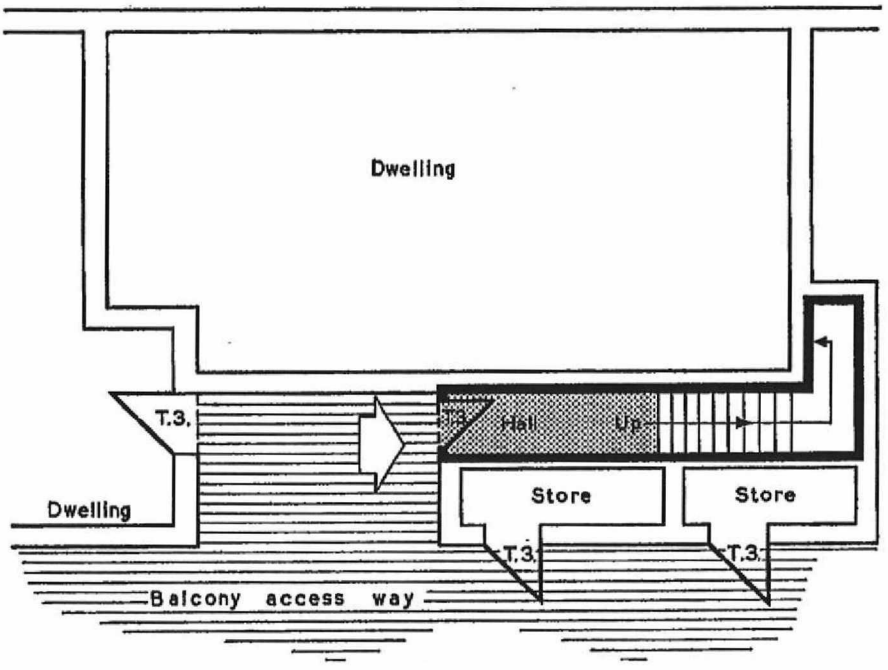
Legend: ■ = ½ h min. fire resistance

Related clauses: 2.2.2
3.2.1

Fig. 3. Flat with inner hall



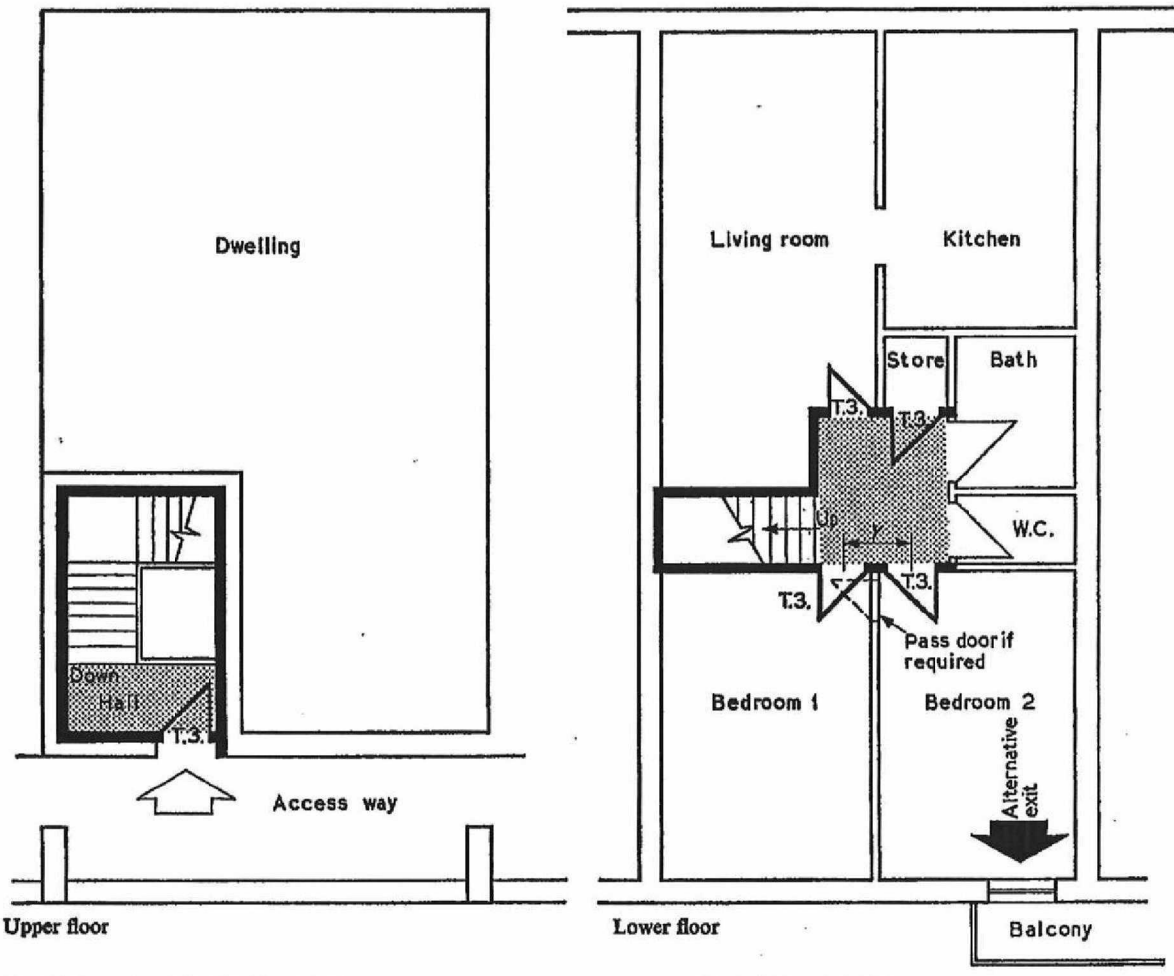
Accommodation upper floor



Entrance lower floor

Legend: ■ = ½ h min. fire resistance
X = no alternative exit is required where '*X*' does not exceed 7.5 m (approx. 25 ft 0 in)

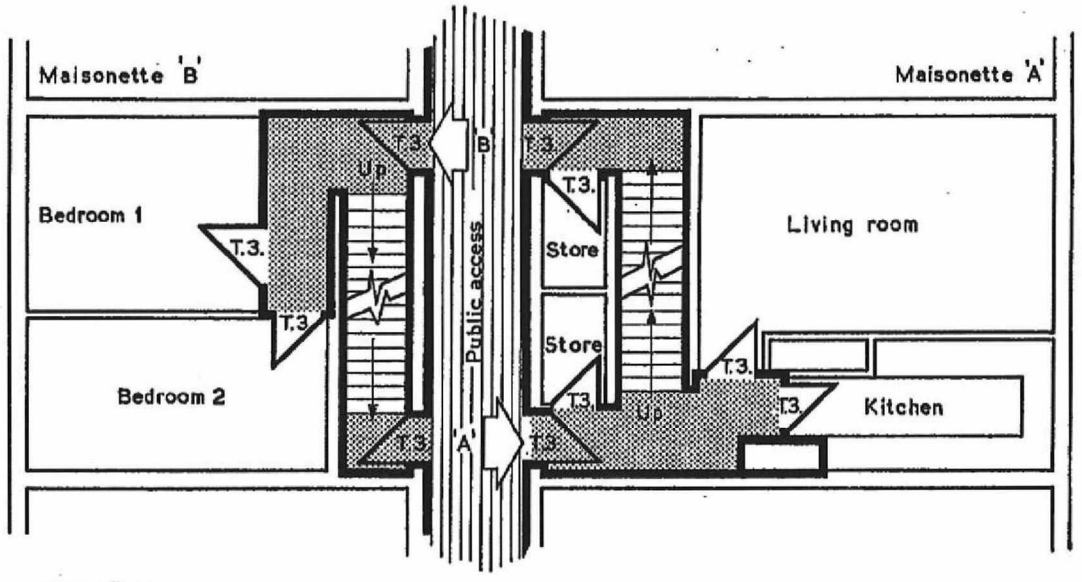
Fig. 4. Flat entered from floor below



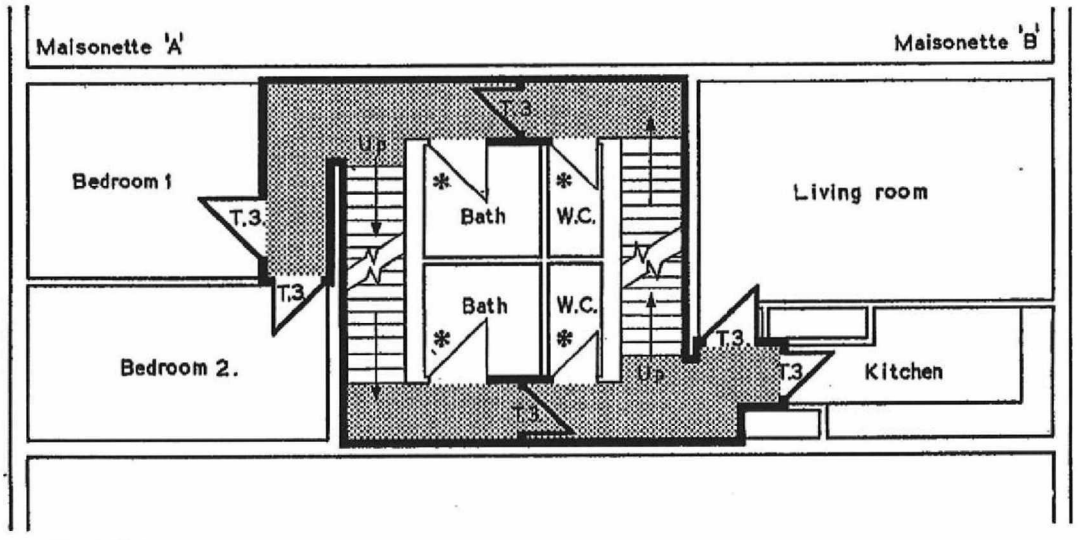
Legend: ■ = ½ h min. fire resistance
Y = A pass door (shown dotted) is required between bedrooms Nos. 1 and 2 if bedroom doors are more than 1.5 m (approx. 5 ft 0 in) apart

Related clauses: 2.2.2
3.2.2

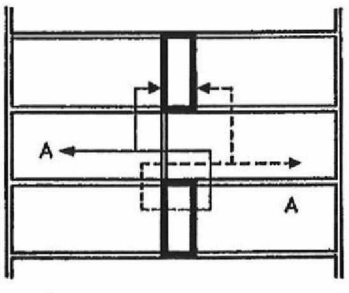
Fig. 5. Flat entered on floor above



Lower floor



Upper floor



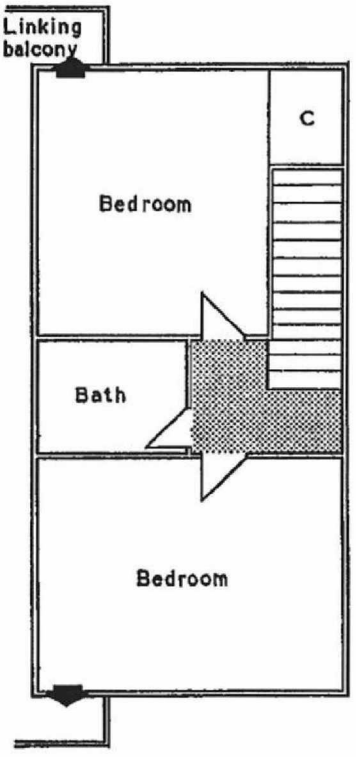
Diagrammatic section

Legend: ■ = ½ h min. fire resistance
* = Bathroom/w.c. area where fire protection will be required when internal fire risk is present

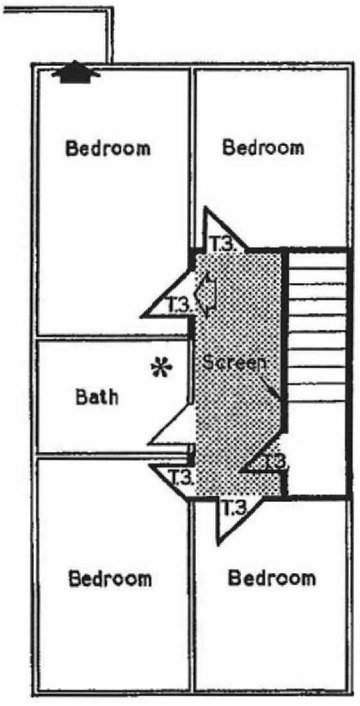
Related clauses: 2.2.3
2.3.5
3.2.3
3.3.3

Fig. 6. Crossover maisonettes

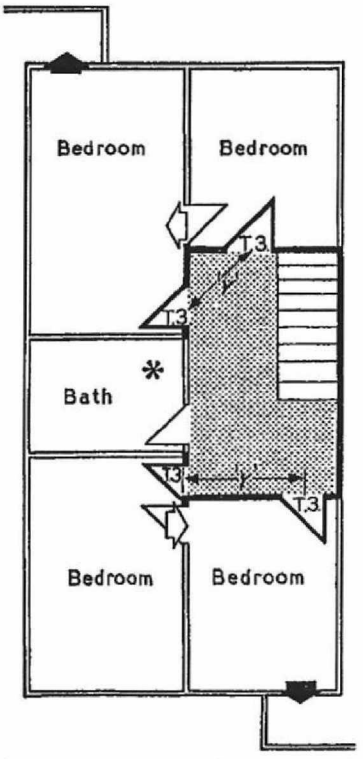
NOTE. These sketches are diagrammatic and do not reflect Parker Morris standards



(i) Upper floor: alternative exit from each bedroom necessary

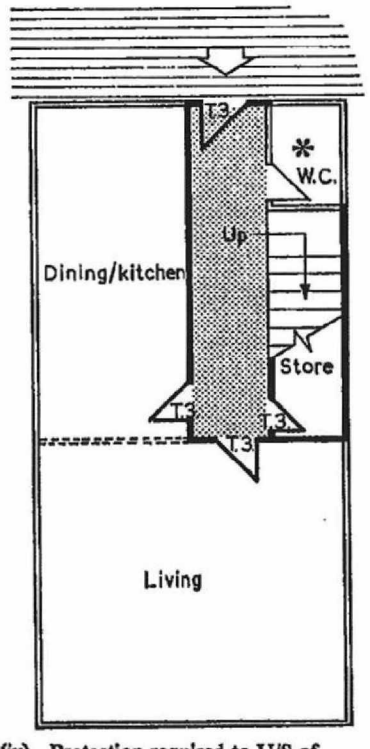


(ii) Upper floor: one alternative exit if T.3 door and ½ h screen at head or base of staircase

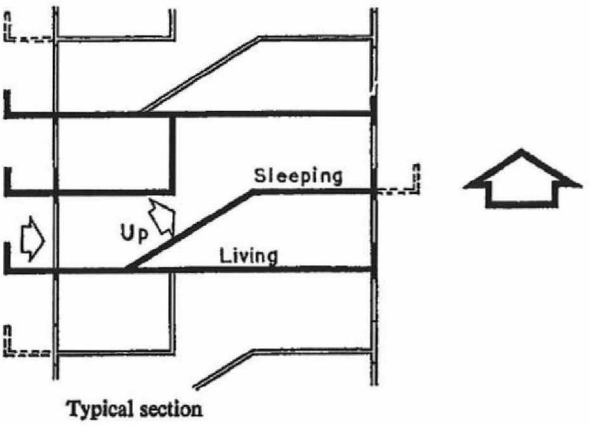


(iii) Upper floor: pass-doors provided between bedrooms where '*Y*' is more than 1.5 m (approx. 5 ft 0 in) only two alternative exits required

Related clauses: 2.2.3
3.2.3



(iv) Protection required to U/S of stairway



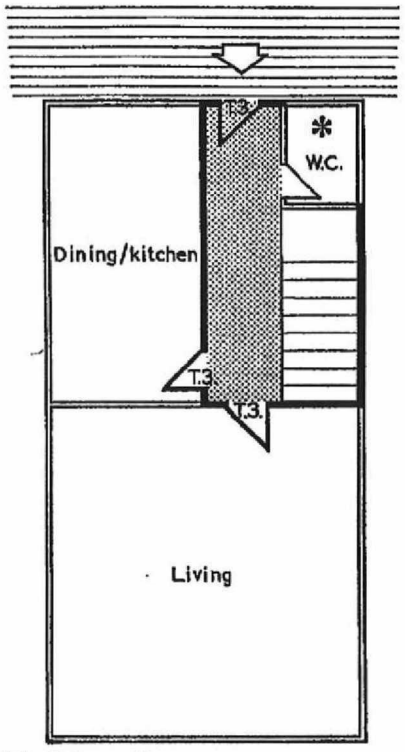
Typical section

Arrangement '**A**': Deck or corridor access maisonette
Entrance floor: Living accommodation
Upper floor: Sleeping accommodation
Alternative escape required from upper floor

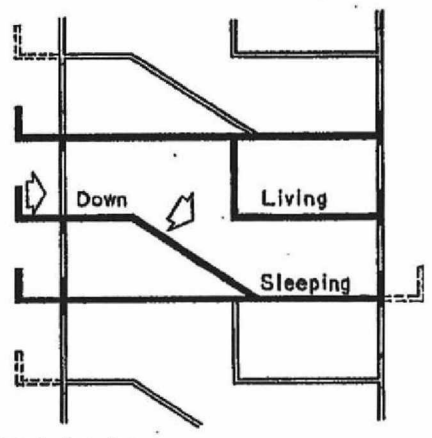
Legend: ■ = ½ h min. fire resistance
* = Bathroom/w.c. area where fire protection will be required when internal fire risk is present

Fig. 7A. Sleeping above living (entrance on floor below)

NOTE. These sketches are diagrammatic and do not reflect Parker Morris standards



(iv) Entrance floor

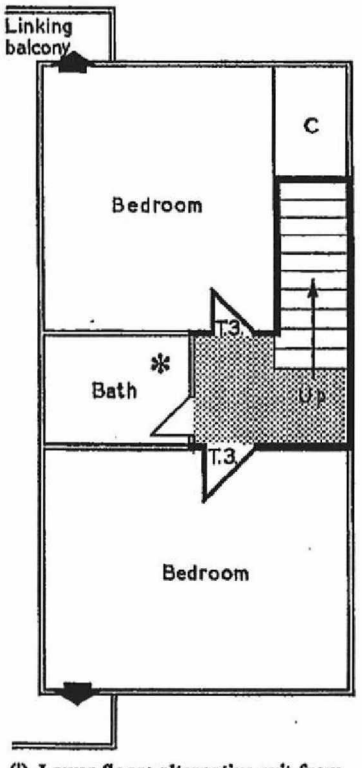


Typical section

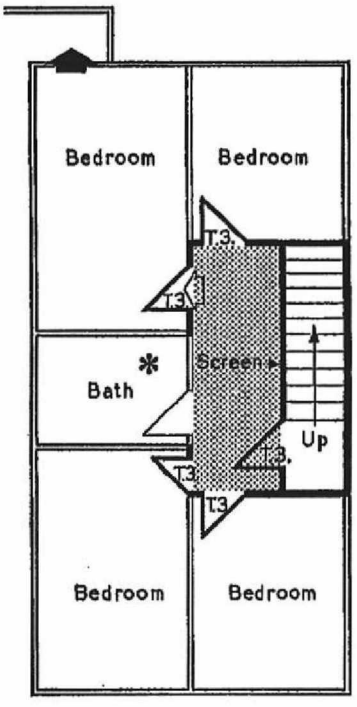
Legend: ■ = ½ h min. fire resistance
* = Bathroom/w.c. area where fire protection will be required when internal fire risk is present

Arrangement 'B': Deck or corridor access maisonette
Entrance floor: Living accommodation
Lower floor: Sleeping accommodation
Alternative escape required from lower floor

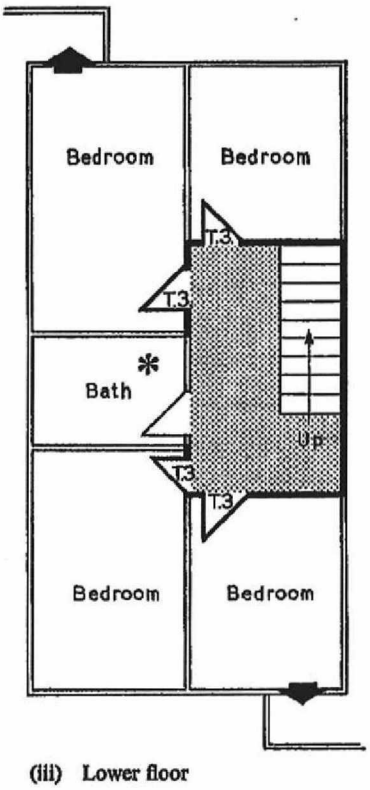
Related clauses: 2.2.3
3.2.3



(i) Lower floor: alternative exit from each bedroom necessary



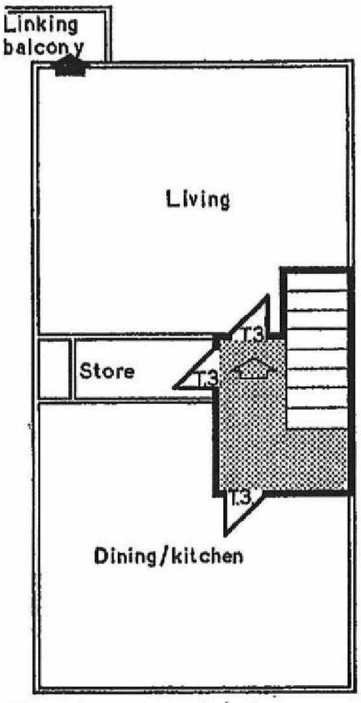
(ii) Lower floor: one alternative exit if T.3 door and ½ h screen at base of staircase



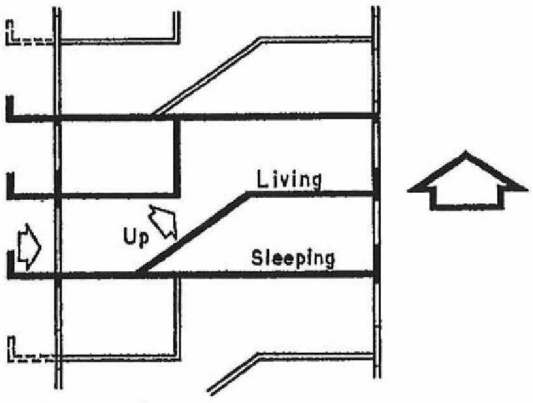
(iii) Lower floor

Fig. 7B. Sleeping below living (entrance on floor above)

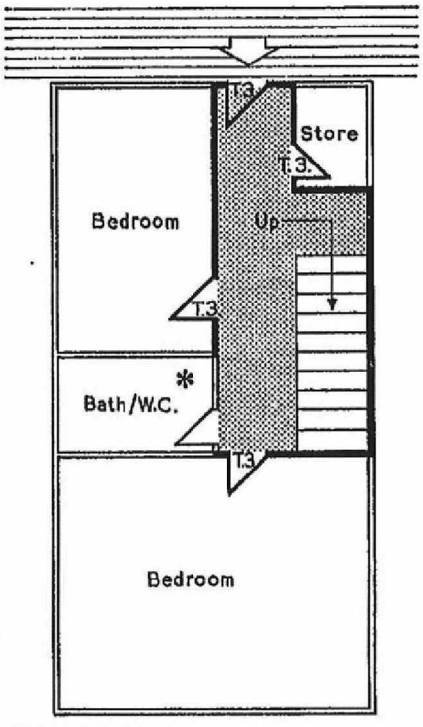
NOTE. These sketches are diagrammatic and do not reflect Parker Morris standards



(i) Upper floor: alternative exit necessary from one side only (non-sleeping risk)



Typical section



(ii) Entrance floor

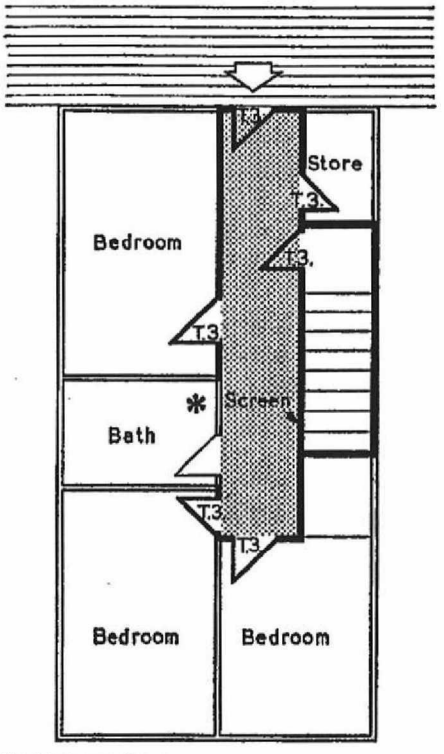
Legend: ■ = ½ h min. fire resistance
* = Bathroom/w.c. area where fire protection will be required when internal fire risk is present

Arrangement 'C': Deck or corridor access maisonette
Entrance floor: Sleeping accommodation
Upper floor: Living accommodation
Alternative escape required from upper floor

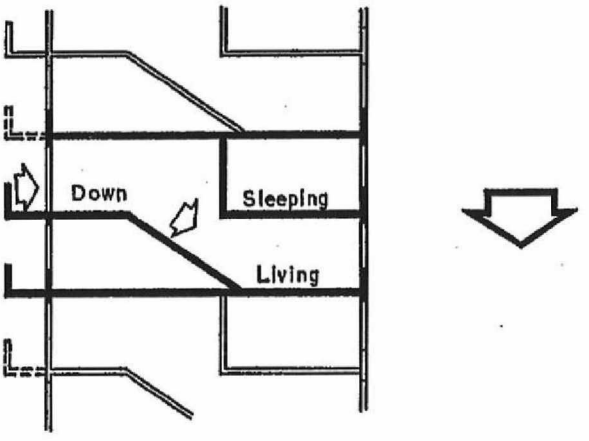
Related clauses: 2.2.3
3.2.3

Fig. 7C. Sleeping below living (entrance at sleeping level)

NOTE. These sketches are diagrammatic and do not reflect Parker Morris standards

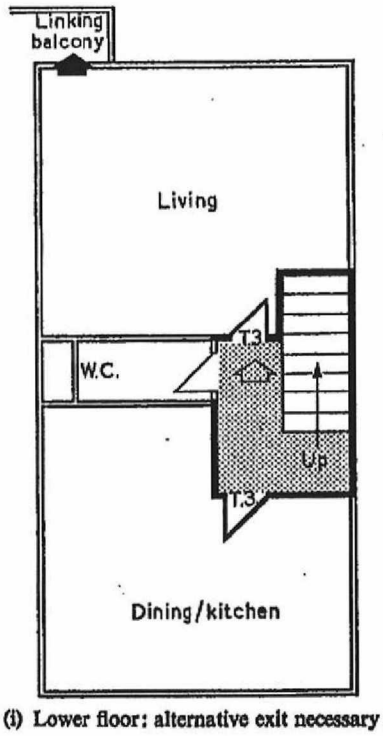


(ii) Entrance floor



Typical section

Legend: ■ = ½ h min. fire resistance
* = Bathroom/w.c. area where fire protection will be required when internal fire risk is present

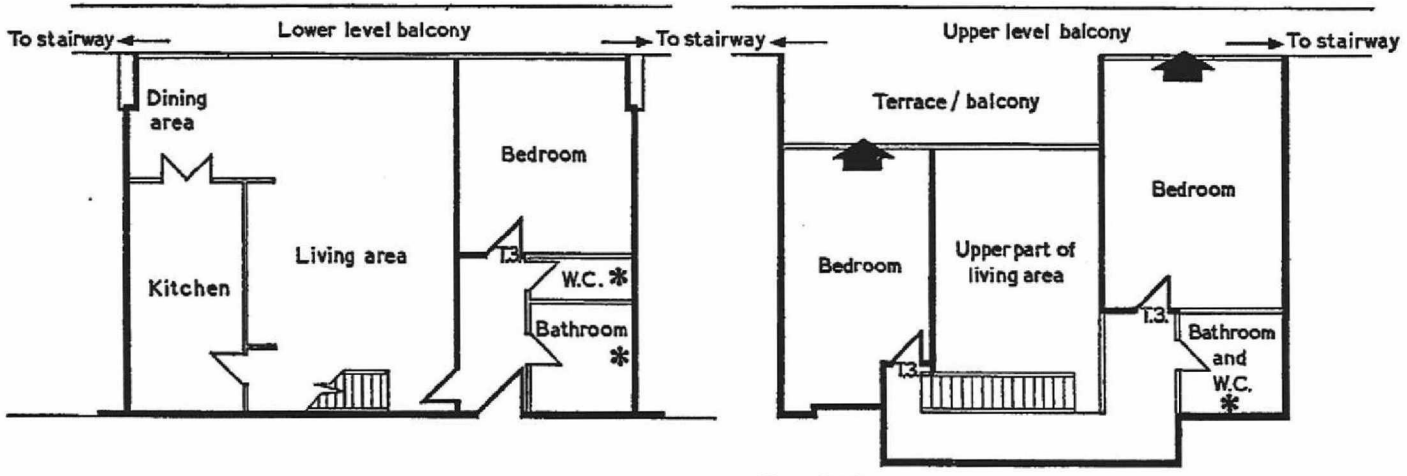


(i) Lower floor: alternative exit necessary from one side only (non-sleeping risk)

Arrangement 'D': Deck or corridor access maisonette
Entrance floor: Sleeping accommodation
Lower floor: Living accommodation
Alternative escape required from lower floor

Related clauses: 2.2.3
3.2.3

Fig. 7D. Sleeping above living (entrance at sleeping level)



Lower level

Upper level

Legend: * = Bathroom/w.c. where fire protection will be required where internal fire risk is present

Related clauses: 2.2.3.6
3.2.3.4

Fig. 7E. Typical open plan maisonette

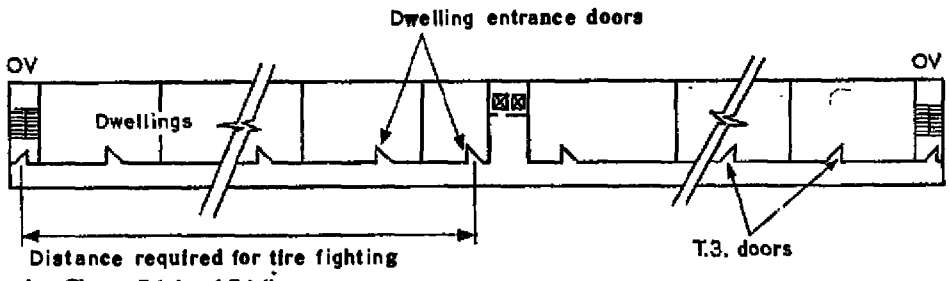


Fig. 8. Balcony access flats and maisonettes: two stairways (common access level)

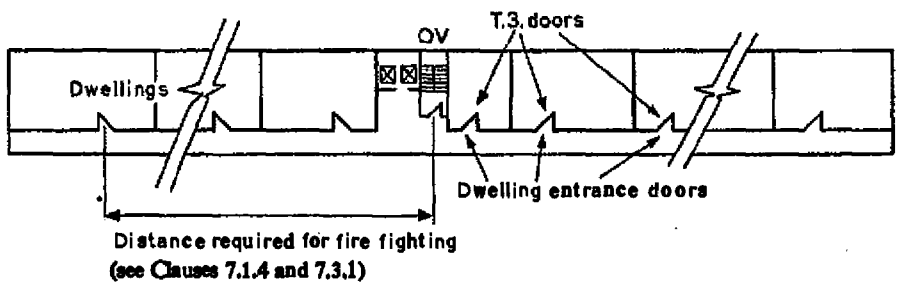
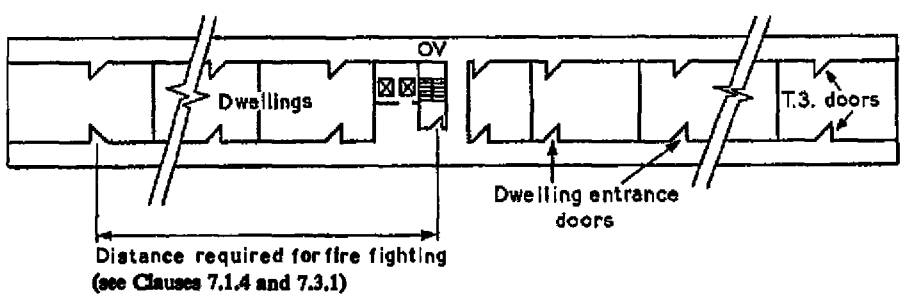
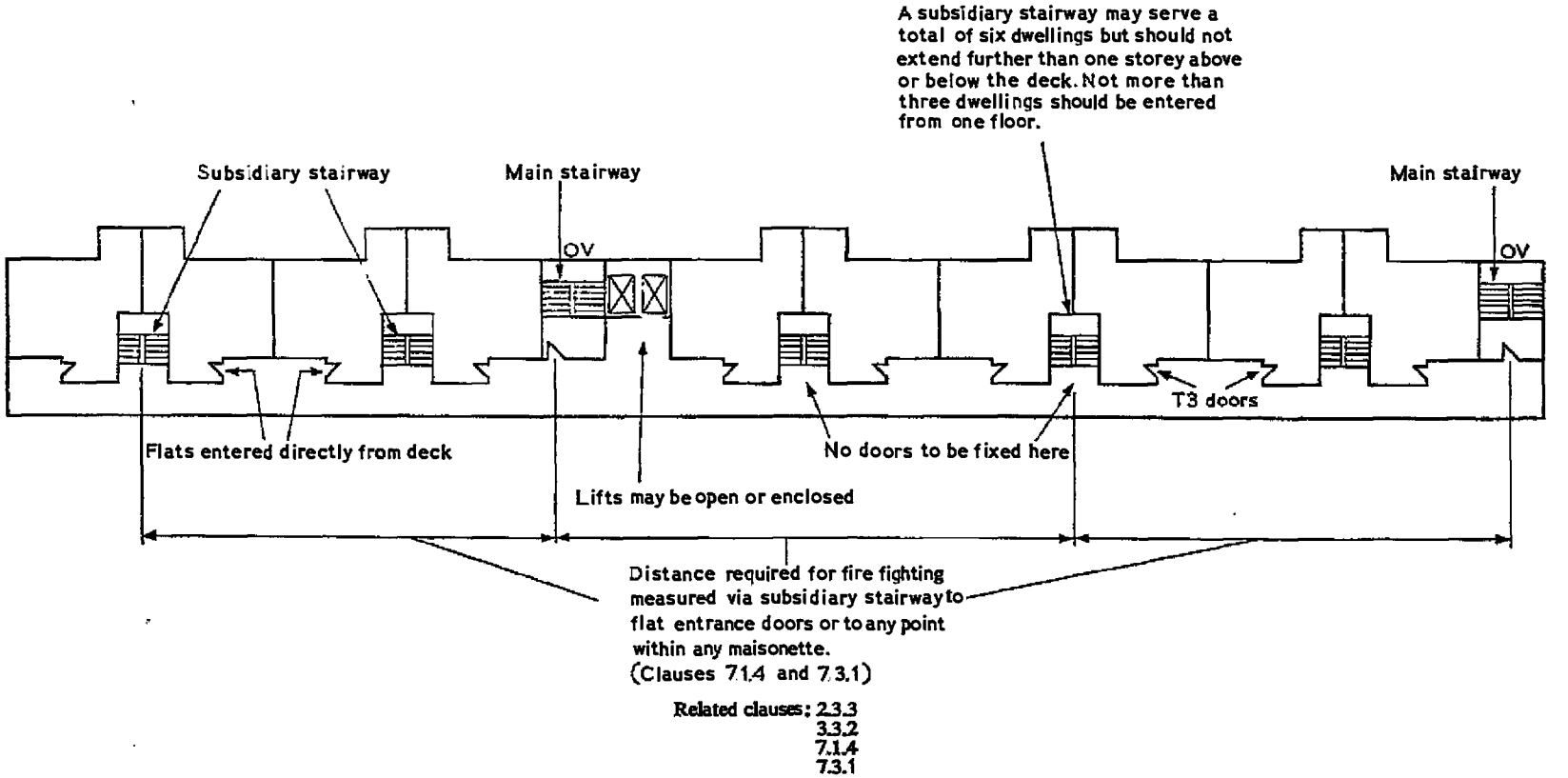


Fig. 9. Balcony access flats and maisonettes: one stairway (common access level)



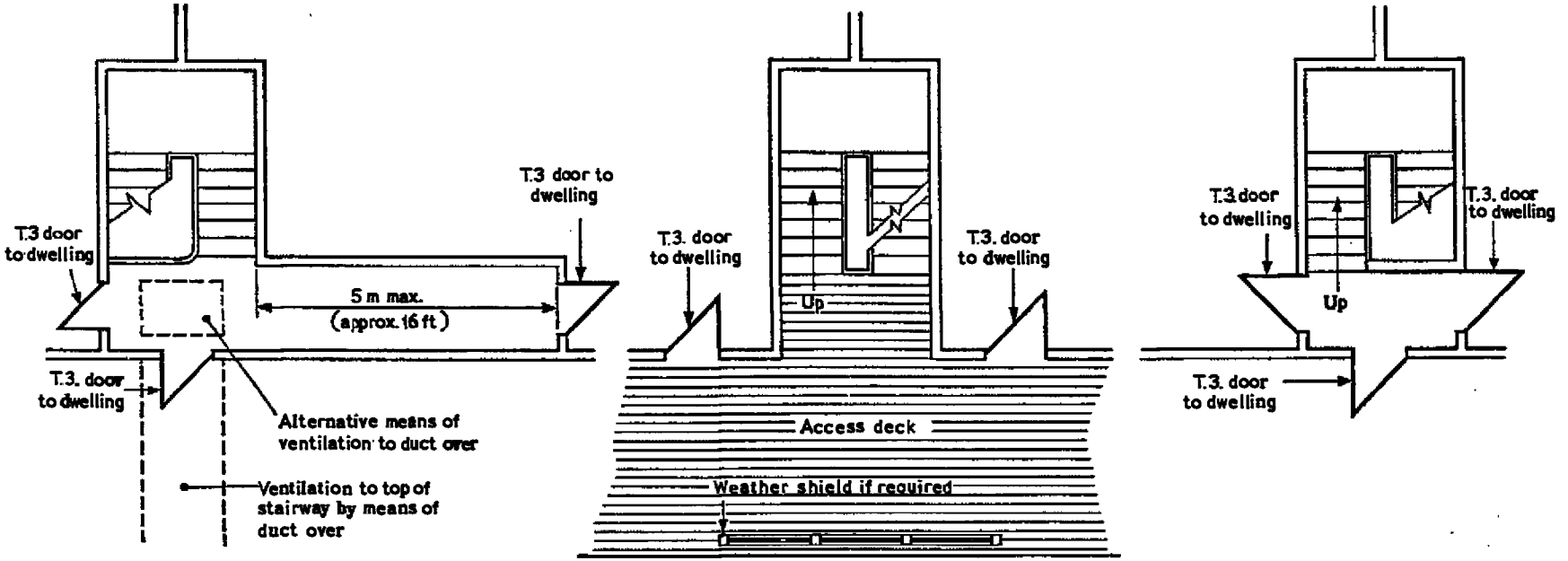
Related clauses: 2.3.1, 2.3.2, 3.3.1, 3.4.3, 7.1.4, 7.3.1
(Figs. 8, 9 and 10)

Fig. 10. Balcony access flats and maisonettes: one stairway with independent alternative escape



Related clauses: 2.3.3
3.3.2
7.1.4
7.3.1

Fig. 11. Dwellings entered indirectly off balcony or deck by subsidiary stairway



Upper floor

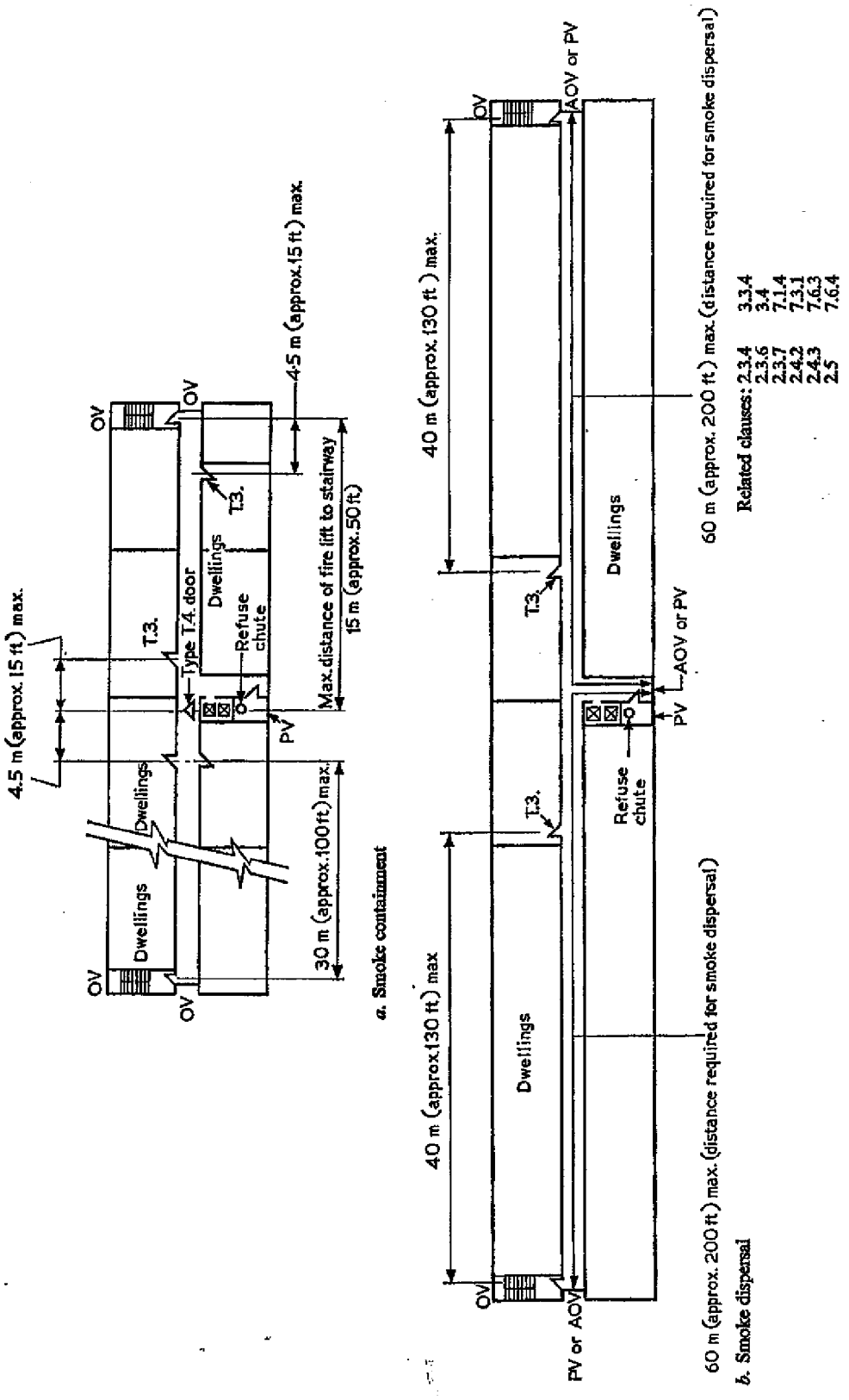
Middle floor (deck) plan

Lower floor

See Section 3 'Planning: Recommendations'

Related clauses: 2.3.3
3.3.2
3.4.6

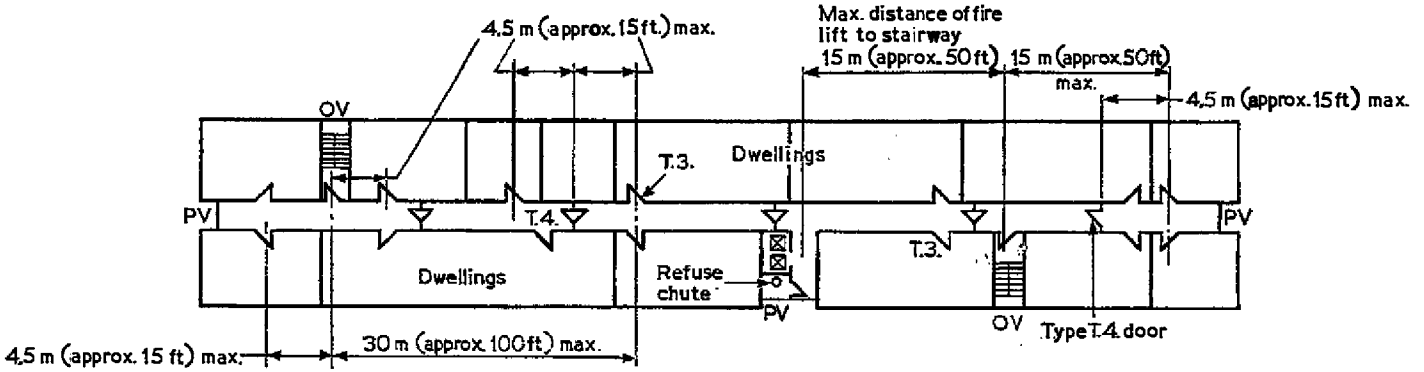
Fig. 12. Dwellings entered off balcony or deck (via subsidiary stairway)



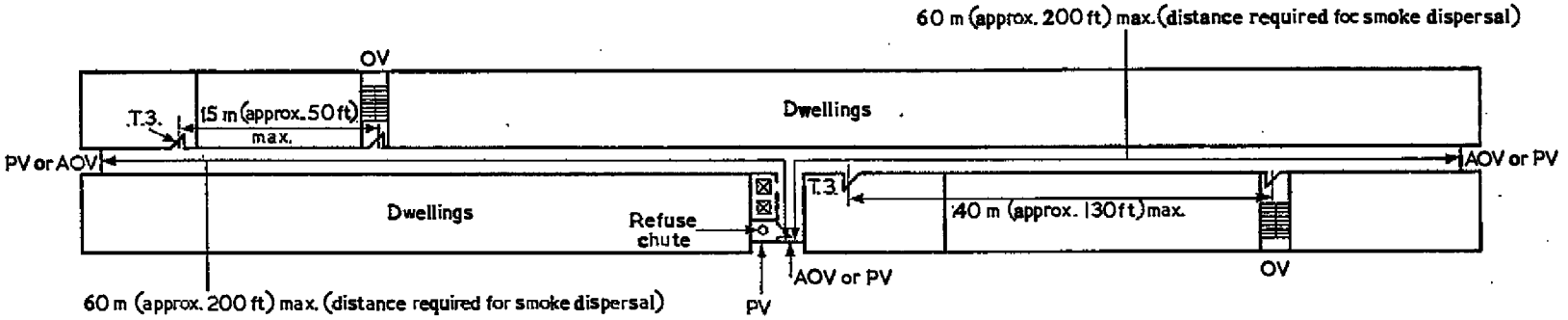
a. Smoke containment

b. Smoke dispersal

Fig. 13. Corridor access flats: two staircases



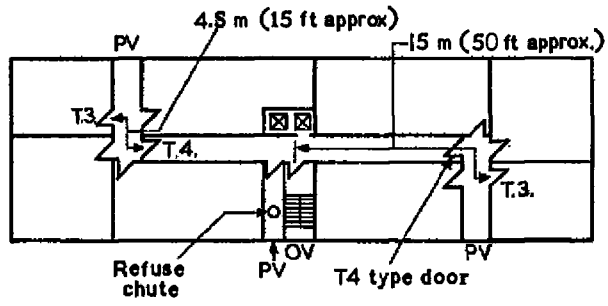
a. Smoke containment



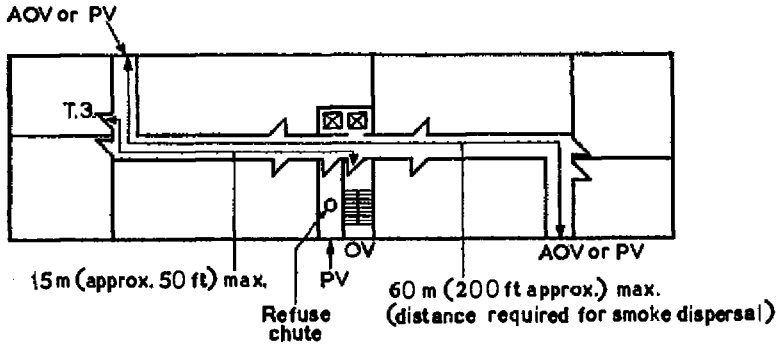
b. Smoke dispersal

Related clauses: 2.3.4 3.3.4
2.3.6 7.1.4
2.3.7 7.3.1
2.4.2 7.6.3
2.4.3 7.6.4
2.5

Fig. 14. Corridor access flats: two stairways with dead ends



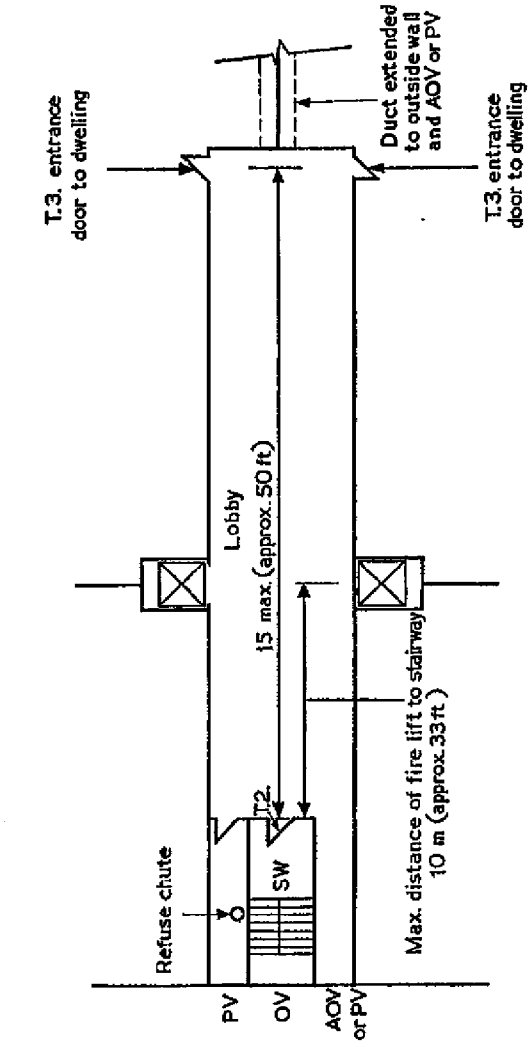
a. Smoke containment



b. Smoke dispersal

Related clauses: 2.3.4
2.3.6
2.3.7
2.4.2
2.4.3
2.5
3.3.4
3.4
3.4.3
7.1.4
7.3.1
7.6.3
7.6.4

Fig. 15. Corridor access flats: single staircase

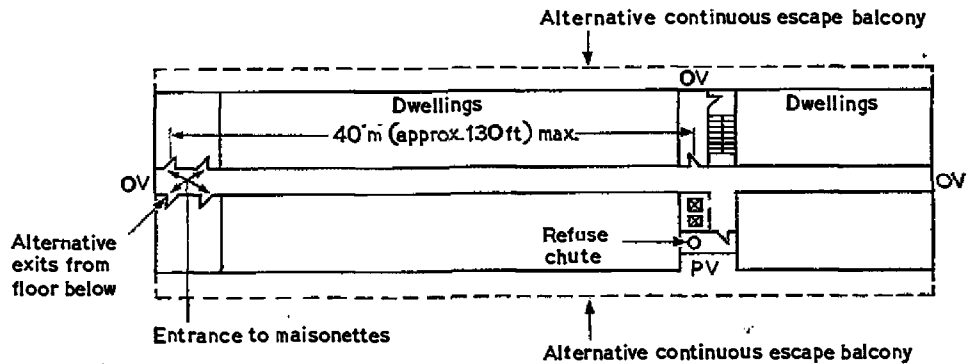


Related clauses: 2.3.4 2.3.6 2.3.7 2.4.2 2.4.3 2.5 3.3.4 3.4 3.4.3 7.1.4 7.3.1 7.6.3 7.6.4

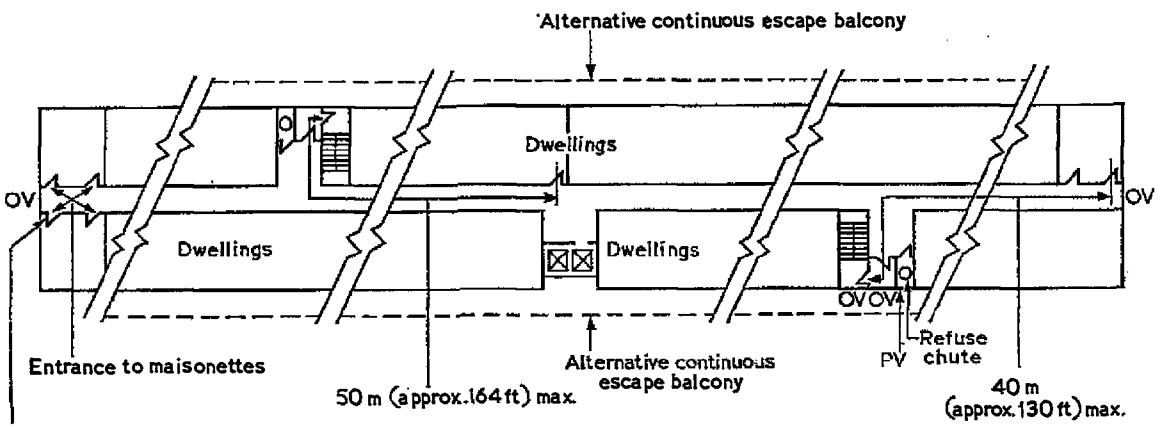
a. Smoke containment

b. Smoke dispersal

Fig. 16. Corridor access flats: single staircase tower block

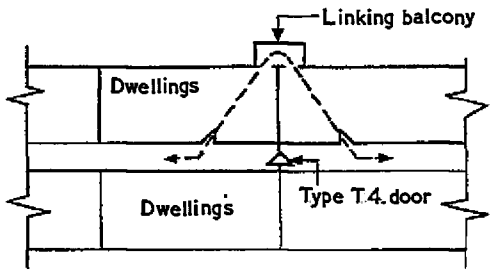


a. One stairway

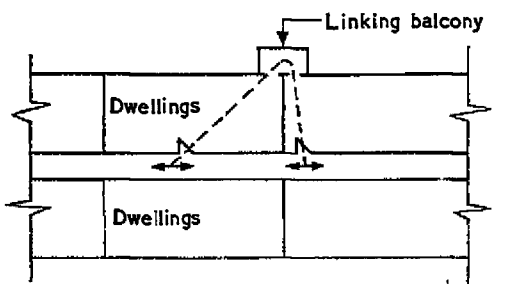


b. Two stairways

Fig. 17. Corridor access flats or maisonettes with alternative escape



Where alternative means of escape from a dwelling is provided via a linking balcony to an adjoining dwelling and thence to a central common corridor, the dwelling entrance doors should be separated by a type 4 door across the corridor (e.g. smoke containment).



Alternative means of escape as above but type 4 door may be omitted across corridor where smoke dispersal is adopted.

Related clause: 3.3.3

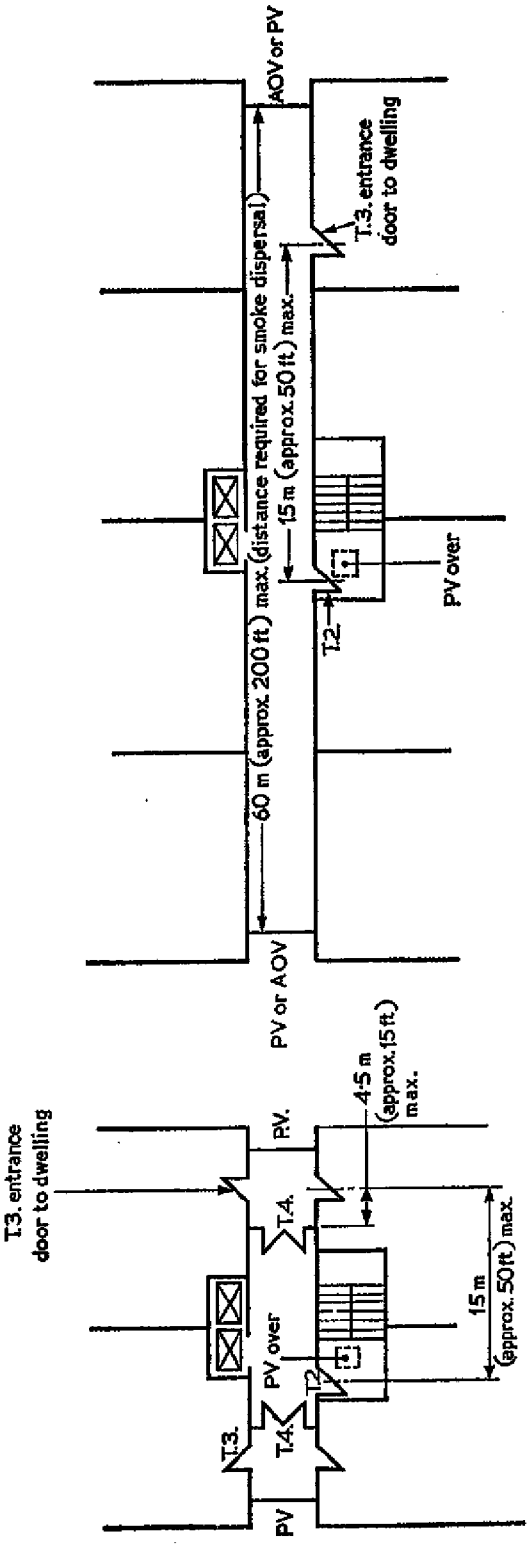
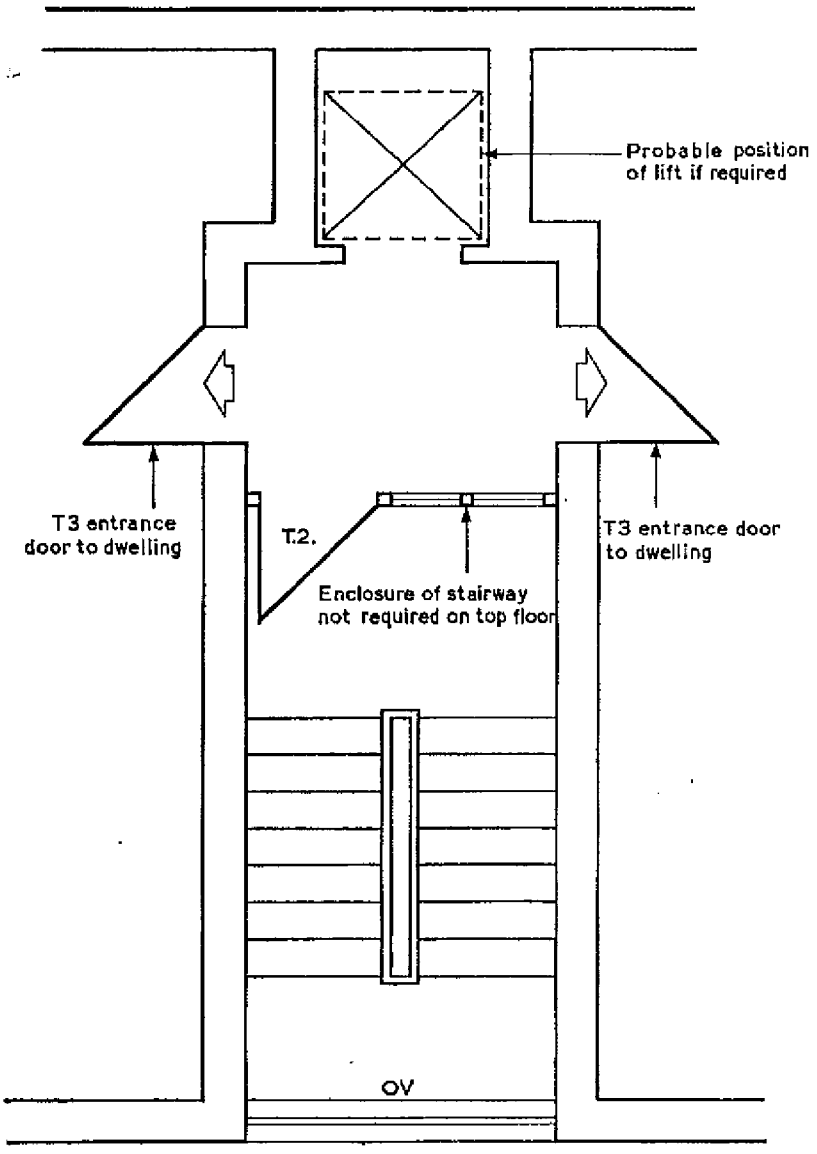


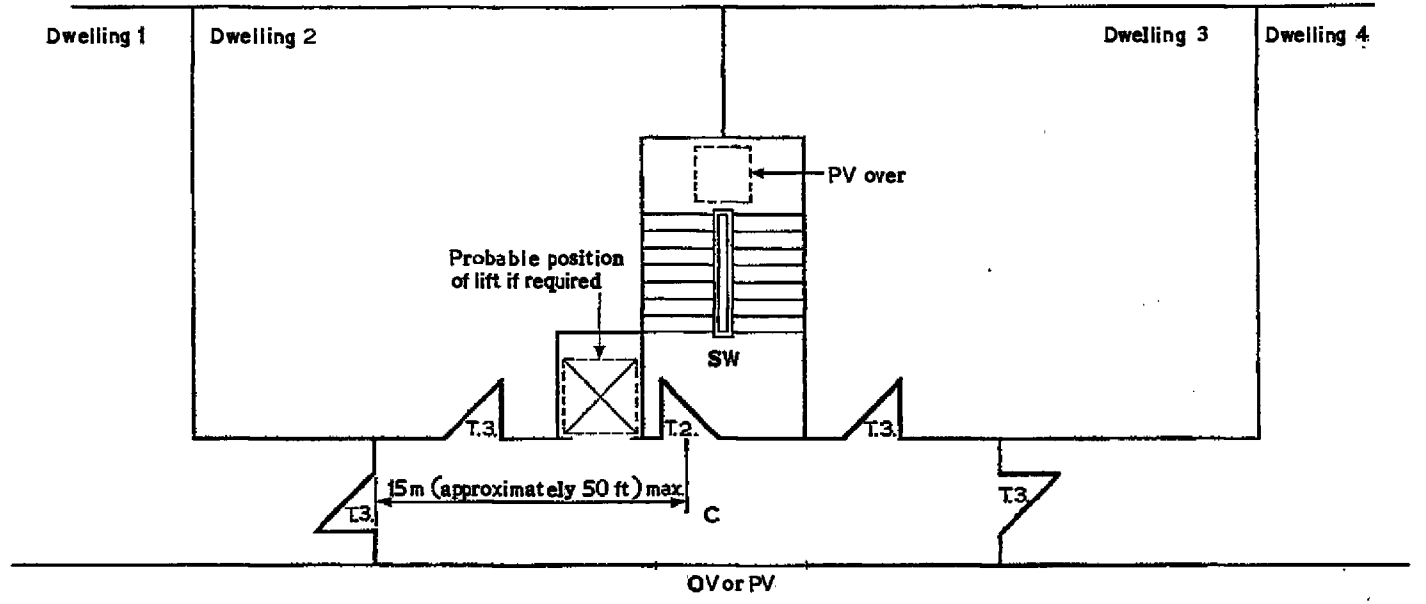
Fig. 18. High point blocks



Related clauses: 2.4.2.5
3.4.3.3
7.1.3
7.1.4

NOTE. In Local Authority dwellings a lift is required if occupants must otherwise walk up more than 2 storeys.

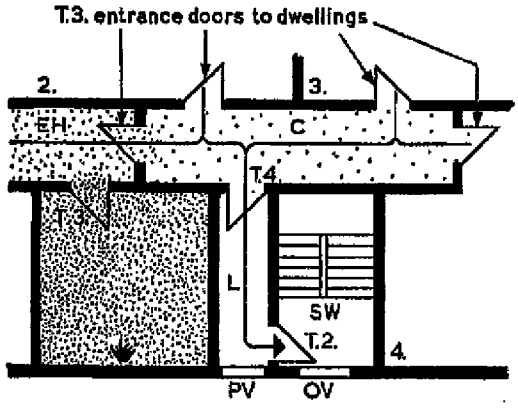
Fig. 19. Single stairway: small 4 storey building



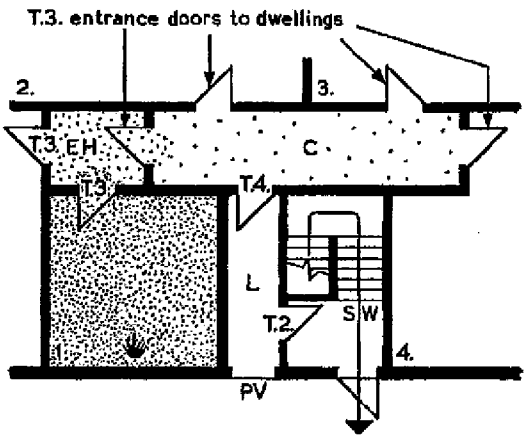
NOTE. In Local Authority dwellings a lift is required if occupants most otherwise walk up more than 2 storeys.

Related clauses: 2.4.2.5
3.4.3.3
7.1.3
7.1.4

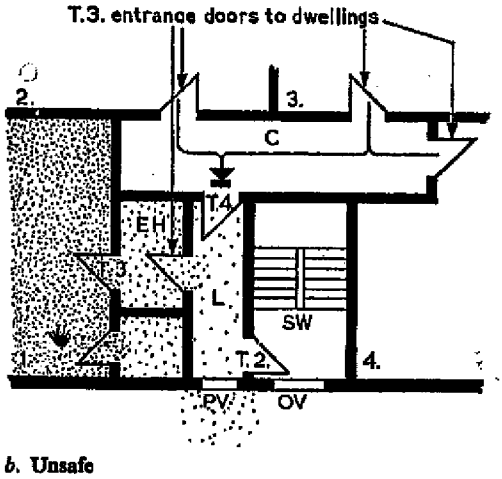
Fig. 20. Single stairway: larger 4 storey building



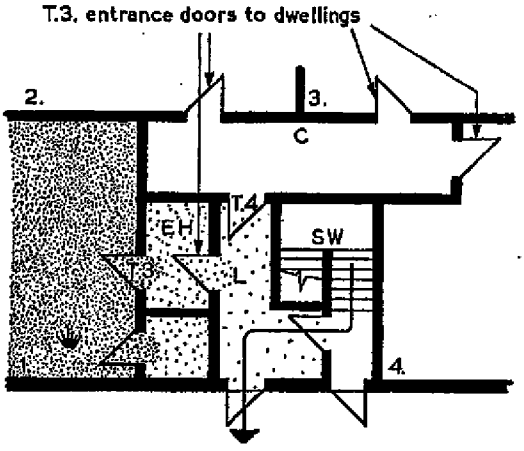
a. Safe



c. Ground floor: safe



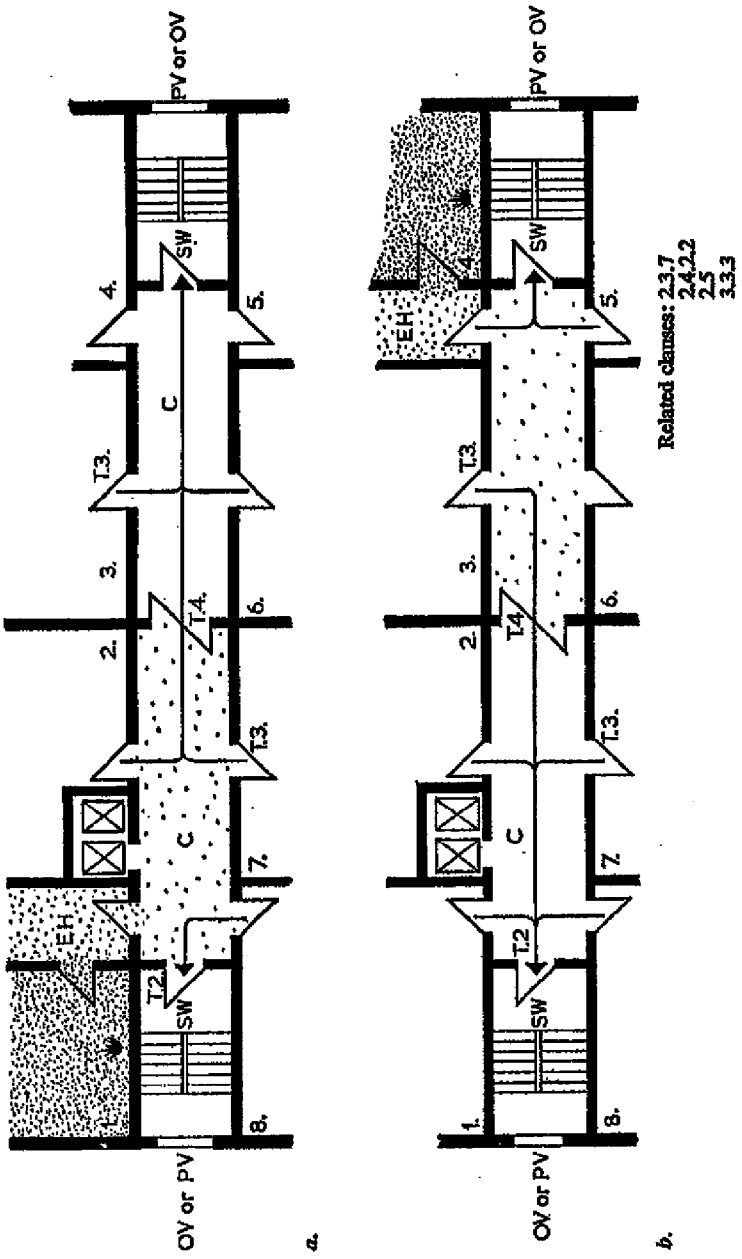
b. Unsafe



d. Ground floor: unsafe

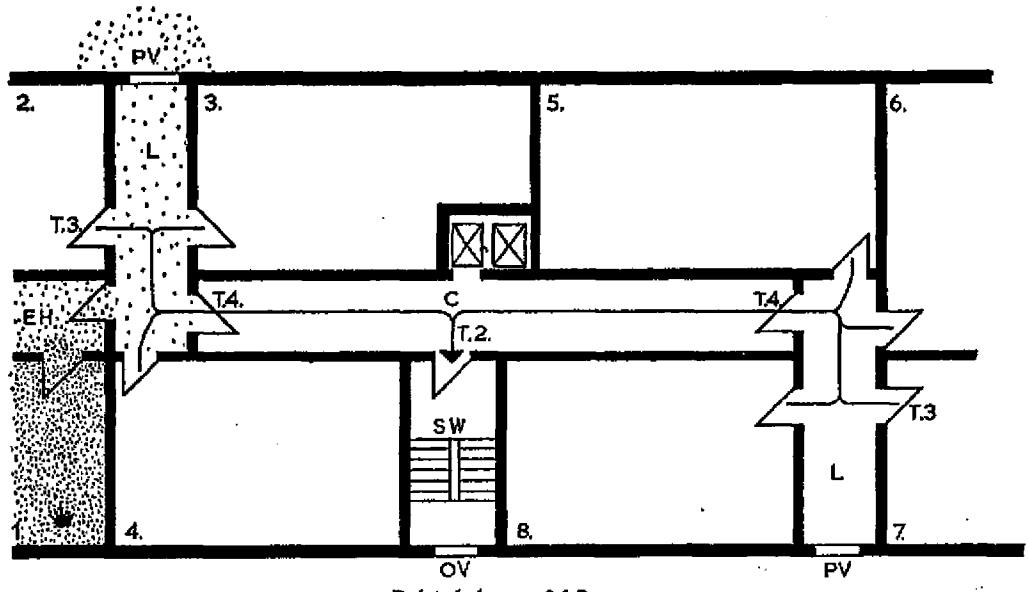
Related clauses: 2.3.6 2.4.2.4
2.3.7 2.4.5
2.4.2.2 3.3.3

Fig. 21. Ventilated lobbies



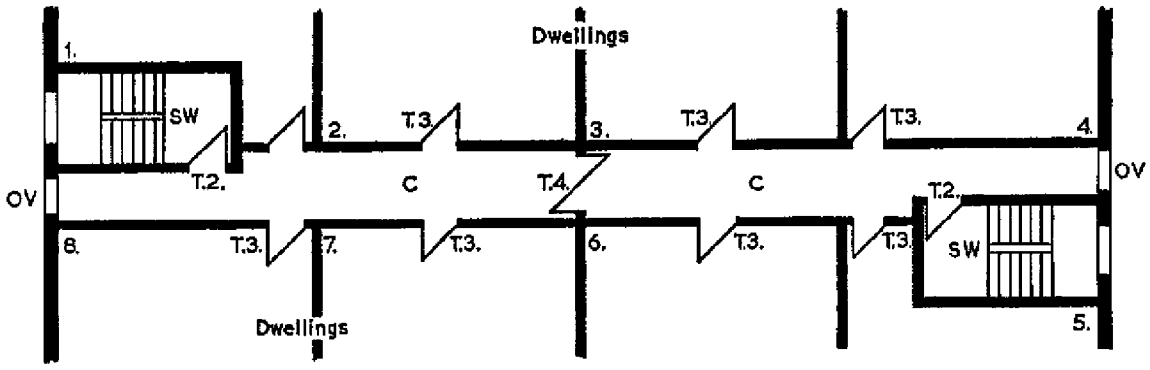
Related clauses: 2.3.7
2.4.2.2
2.5
3.3.3

Fig. 22. Corridor ventilation

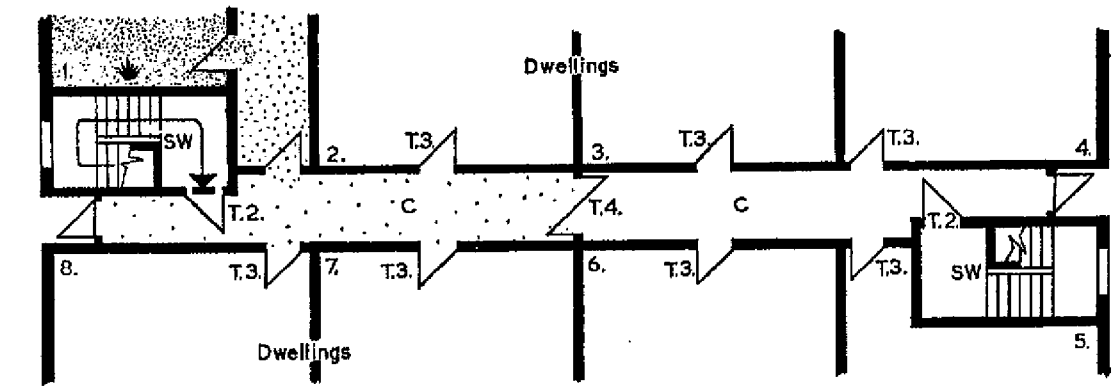


Related clauses: 2.3.7
2.4.2.4
2.5

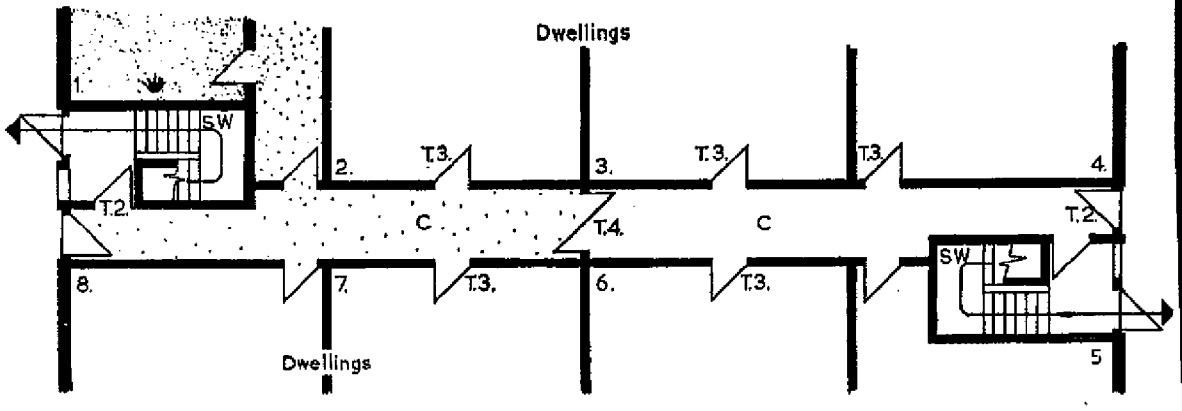
Fig. 23. Corridor ventilation: alternative method



a. Upper floor



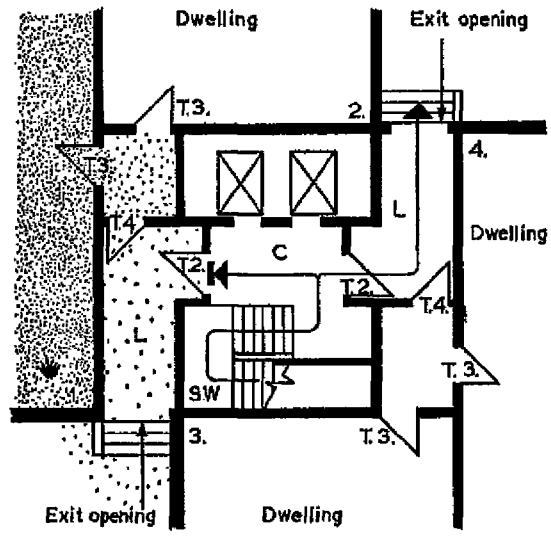
b. Ground floor



c. Ground floor

Related clauses: 2.4.5
2.5

Fig. 24. Safeguarding stairways



Ground floor plan

Related clause: 2.4.5.6

Fig. 25. Smoke containment: single stairway

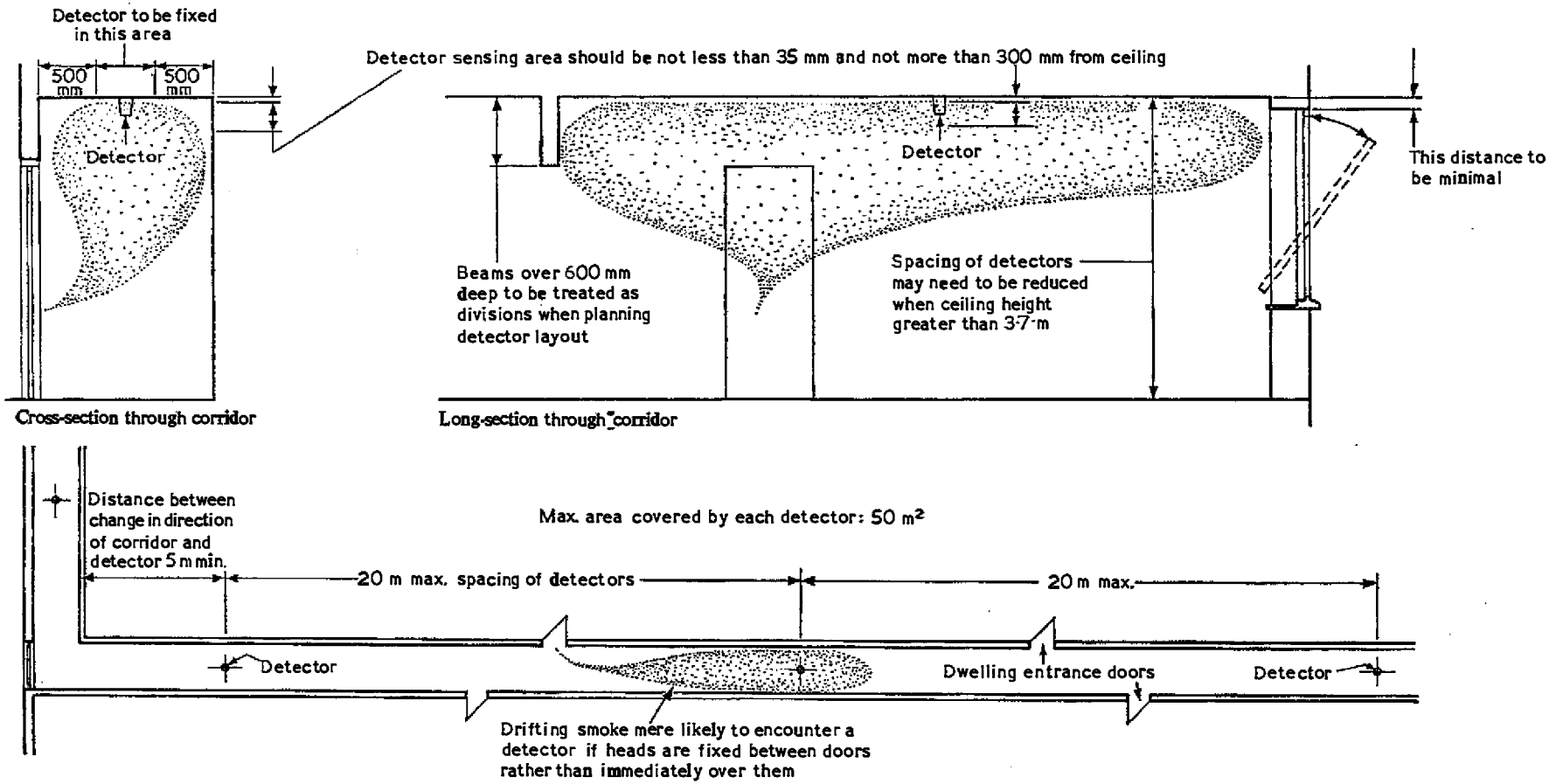


Fig. 26. Typical smoke detector arrangements (as recommended for smoke dispersal)