
GUERNSEY STATUTORY INSTRUMENT

1991 No. 18

The Fire Services (Guernsey) Law, 1989
Code of Guidance No 1 - Places of Work

Made ... ... 13th June 1991

Laid before the States ...

Coming into operation ... 4th November 1991

THE COMMITTEE FOR HOME AFFAIRS, in exercise of the powers conferred upon it by section 8(1)(b) of the Fire Services (Guernsey) Law, 1989, and in exercise of all other powers enabling it in that behalf, has this day made this Code of Guidance which shall come into operation on the 4th November 1991.

Dated this thirteenth day of June 1991

MICHAEL W TORODE,

President of the Committee for Home Affairs
for and on behalf of the said Committee

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1. INTRODUCTION

1.1 The purpose of this code of guidance, which is issued solely in connection with the operation of the Fire Services (Guernsey) Law, 1989, is to set out basic standards for means of escape and related fire precautions in existing places of work. It is intended both for the guidance of the Fire Brigade and for the information of those responsible for the management of places of work. A contravention of the code of guidance does not of itself render a person liable to civil or criminal proceedings. The contravention may, however, in any proceedings in which there is in issue a liability or contention in relation to which the provision of the code appears to the court to be relevant, be relied upon by any party to the proceedings as tending to establish or negative the liability or contention. It is hoped that the code of guidance will assist in achieving a uniform approach to the implementation of the Law in the relevant premises. It should also be noted that the provisions of this Code are in addition to, and not in derogation from, the provisions of Section 6 of the 1989 Law, which lays down the basic legal duties of occupiers of premises. Occupiers must therefore, as well as observing the guidance set out in this Code, also comply at all times with Section 6 and with any relevant regulations made under the Law.

1.2 Because the registration procedure under the Law is concerned with buildings in use for a designated purpose, this code of guidance is directed mainly at existing places of work. It may also be useful, with due regard to the difference in viewpoint, to those who contemplate bringing a building into use as a place of work or adapting or converting a building for the purpose. However, it must be emphasised that in doing so the requirements of Building Regulations which may be applicable will have to be met, and the recommendations of this code of guidance cannot be taken as necessarily satisfying these or other statutory requirements. Those responsible for places of work are strongly advised not to take action on any costly matters mentioned in this code of guidance without first consulting the Fire Brigade and where appropriate, the departments mentioned below.

1.3 Where any measures necessitate structural alterations to a building, application for approval in accordance with the provisions of the Building (Guernsey) Law, 1956, should be submitted for the consideration and approval of the States Building Inspectors before any work is put in hand.

1.4 Should any of the proposals involve external additions or changes of appearance, application should be made initially to the offices of the Island Development Committee, Sydney Vane House, Rue du Commerce, St. Peter Port, for the consideration of that committee.

1.5 Further to this, where the building is listed as having historical or special architectural features, an application for approval of the works should also be made to the Ancient Monuments Committee.

1.6 The code of guidance cannot, of course, take account of all the fire safety requirements that may be necessary, because of circumstances in particular places of work. It is intended to be used as as indication of the general standard to be aimed at rather than as a set of requirements to be rigidly applied in detail in all circumstances.

MEANS OF PROVIDING FOR SAFETY

1.7 The recommendations in this code are intended to provide safety from fire by means of -

(a) planning and protection of escape routes leading to safety both horizontally and downwards (and/or possibly upwards in a few special circumstances) from any area that may be threatened by fire, so enabling any person confronted by an outbreak of fire to turn away and make a safe escape without outside assistance (see chapters 3 to 7);

(b) construction and finishing with suitable materials and embodying adequate fire resistance in the structure where these are not covered by building regulations (see chapter 8);

(c) segregation of higher fire risk areas (see chapters 2 and 8);

(d) the provision of means of giving warning of fire and, where appropriate, of detecting outbreaks of fire (see chapter 10);

(e) the provision of fire fighting equipment, whether for use by staff in containing fire in its early stages, or by way of assistance to the fire service, or for automatically extinguishing an outbreak of fire (see chapter 12);

(f) the proper instruction and training of staff (see chapter 14).

USE OF THE PRINCIPLES AND RECOMMENDATIONS

1.8 It is not possible to make comprehensive recommendations capable of covering every risk, and an intelligent appreciation of the principles and application of the recommendations of this code is therefore essential. The fire hazards of a particular premise and its contents have to be appreciated and, in order to use this code effectively, the behaviour of a fire occurring in the building has to be anticipated according to the assessment made.

APPLICATION OF ALL THE RECOMMENDATIONS

1.9 Individual recommendations of this code should not be applied in isolation. To ensure maximum benefit, all of the recommendations should be considered. Although the basic principles and recommendations for escape from areas are described in chapters 3 to 7 the most conscientious application of these recommendations would be undermined unless supported by the necessary measures relating to ancillary accommodation, construction, engineering services, fire protection facilities and training set out in chapters 2 and 8 to 14.

DIAGRAMS

1.10 The figures are intended to clarify concept, and should not be taken as indicating the only acceptable forms of planning. The diagrams are numbered with reference to the adjacent paragraph for ease of identification.

Thick lines show where fire resistance is required.

Roman numerals refer to class of fire door required (see paragraph 7.4).

2. ASSESSMENT OF FIRE RISK

2.1 As premises covered by this guide can vary so greatly in size and layout, the risk of fire can also vary considerably from one situation to another, particularly in factories where differing processes are carried out and hazardous substances are stored or used. It is essential, therefore, that the fire precautions to be provided should be determined having regard to all relevant circumstances.

2.2 It is not possible to offer clear-cut, hard and fast rules for making these assessments but is is possible to describe in broad terms the kind of factors which will need to be considered to determine the level of fire risk that would place the premises (or part) into one of three categories of risk ie; `high', `normal' or `low', thus enabling adoption of whichever is more appropriate of the precautions recommended for the premises in this guide.

2.3 The detail contained in the following paragraphs should be treated as broad indicators and it is emphasised that all factors must be considered, which include any automatic fire detection and suppression system that may be installed, eg sprinklers installed for the overall protection of the building, or other fire extinguishing systems covering specific areas of special fire risk. The presence of any of these systems may significantly reduce the dangers of rapid fire growth and consequently may have a bearing on the final risk assessment. It does not necessarily follow that the presence (or indeed the absence) of, say, one of the factors mentioned in the description of risk category inevitably means the premises (or part) has to be placed in the `high' or if it is absent, the `low' category. It is likely, however, that in many factory and shop premises there is a mixture of risks.

ASSESSMENT OF HIGH RISK

IGNITABLE MATERIALS

2.4 The factor most likely to justify treating the risk as high is the presence in the premises (or part) of any material, dust, vapour, gas or liquid in such quantity and/or disposition or of such nature as is likely, when ignited, to cause fire, smoke or fumes to spread rapidly. Whilst it is generally assumed that these risks are most likely to be present in manufacturing processes and in materials stored or used in factories, it is by no means uncommon to find similar risks present in shops which retail products whose constituent parts are of a highly combustible nature and which, by the manner of display and/or location presents a concentrated area of high risk. Other factors to be taken into account follow in paragraphs 2.5 to 2.9.

UNDESIRABLE STRUCTURAL FEATURES

2.5 Undesirable structural features such as -

(i) stairways in factories which cannot be separated from workrooms, machinery room, or areas of higher risk, unenclosed vertical shafts, wooden floors supported on wooden joists and particularly, in the case of factories, if they are oil soaked.

(ii) the complexity of escape routes caused by extensive sub-division of large floor areas by partitions or island display units in shops.

(iii) large areas of flammable surfaces (either of walls, ceilings (see paragraphs 8.13 to 8.17)) or of stacked stock materials or displayed goods.

UNUSUAL OCCUPANCIES

2.6 Any unusual occupancy relating to those who are permanently employed in the premises or members of the public resorting thereto, such as - large numbers of persons relative to the size of the building, occupants mainly or predominantly disabled persons, individuals or small groups of people working in isolated parts of the building. Consideration should also be given to the staff/customer ratio in shops which will determine the level of assistance the public could expect in an emergency.

FUNCTIONAL AREAS

2.7 A specific area which due to its function may present a greater risk of fire occurring and developing than elsewhere eg a manufacturing process handling highly flammable substances, a large kitchen associated with a restaurant (public or staff), oil fired boiler rooms and transformer and switchgear rooms.

UNDERGROUND CAR PARKS

2.8 Buildings which contain underground car parks with either -

(a) a floor area of more than 500 sq m; or
(b) room for 20 or more vehicles;

should be provided with an automatic sprinkler system.

STORAGE AREAS

2.9 Parts of premises which, because of the nature of the materials displayed or stored or because of the methods of storage, present a higher than normal risk to life in the event of fire. In these circumstances it may not be possible to ensure evacuation within a reasonable time using the standards set out in this guide. In particular this may arise in furniture departments in shops (see 2.10 below).

ADVICE FOR STORAGE AREAS

2.10 When the above situation arises, consideration should be given to the adoption of the following measures -

(i) only goods on display should be stored in those parts of the premises which are sales areas, ie to which the public normally have access;

(ii) the storage of goods should be restricted to those parts of the premises to which the public are not admitted. Such parts should be separated from the remainder of the premises by an enclosure, the floors, walls and self-closing doors of which possess a standard of fire resistance of not less than 60 minutes. The enclosure should not form any part of an escape route which would have to be used by members of the public in case of fire;

(iii) the storage of goods should be arranged so that there is a clear passageway from any point in the storage enclosure to a means of escape;

(iv) displays of goods in public areas should be so arranged that there is unimpeded access to all gangways leading to exits and the manner of display should be such that it does not obstruct a clear view of exits and their associated exit signs;

(v) as far as is reasonably practicable, the display of goods should not take place on the same floor as an area that will attract a large congregation of the public at any one time eg a restaurant or bar, or any part where persons are invited to wait and receive specialist services on the premises eg hair dressing and beauty treatment salons;

(vi) goods on display which are accessible to the public, eg for demonstration or examination purposes, should not be stacked, nor should they have coverings that are easily ignited;

(vii) smoking should be prohibited in all areas where goods are stored or displayed and notices to this effect should be conspicuously displayed;

(viii) it is recommended that in any shop in which substantial quantities of such goods are always present, a sprinkler system should be installed which conforms to British Standard 5306 : Part 2. The sprinkler system and any other automatic fire detection installation provided should be linked into a fire warning system which is terminated at the Fire Station.

ASSESSMENT OF NORMAL RISK

2.11 Generally, in offices and in a high percentage of shops and factory premises (or parts) the risk can be regarded as 'normal'. By this it is meant that the circumstances are such that any outbreak of fire is likely to remain localised or is likely to spread only slowly and in which there is little risk of any part of the structure of the building taking fire readily.

ASSESSMENT OF LOW RISK

2.12 In a very small percentage of premises all the factors to be considered will be favourable and it will be reasonable to accept standards of precautions in some respects much lower than those recommended for normal situations, particularly in factories (or parts) where there are very few flammable and no explosive materials present and where the risk of fire breaking out and smoke or fumes spreading rapidly is minimal. Buildings (or parts) used for heavy engineering can often be placed in this category. Other examples are places where the process is entirely a wet one and non-combustible materials predominate.

3. MEANS OF ESCAPE - INTRODUCTION

DEFINITION

3.1 The definition of means of escape is - structural means whereby a safe route is provided for persons to travel from any point in a building to a place of safety.

3.2 The design of means of escape from a building must be based on an appreciation of the probable behaviour of fire, which may break out in any part of the building and then cause smoke, heat and flame to spread to other parts. Although recommendations based on such considerations can be devised, they can be used intelligently only if the nature of the risks which they are intended to meet is continually borne in mind. The design of a building should therefore be analysed, part by part, in order to determine the danger which might arise from a fire, either in the part where the fire may originate or in any other part to which it may spread. The value of analysing a plan with these facts in mind cannot be over-stressed. To illustrate this approach to the problem, the following paragraphs contain a study of the behaviour of fire in the course of which the fundamental precautions which form the basis of the recommendations in this code are deduced. Cross references are given to the later parts of the code where these general principles are expressed as specific recommendations.

SUB-DIVISION OF ESCAPE ROUTES

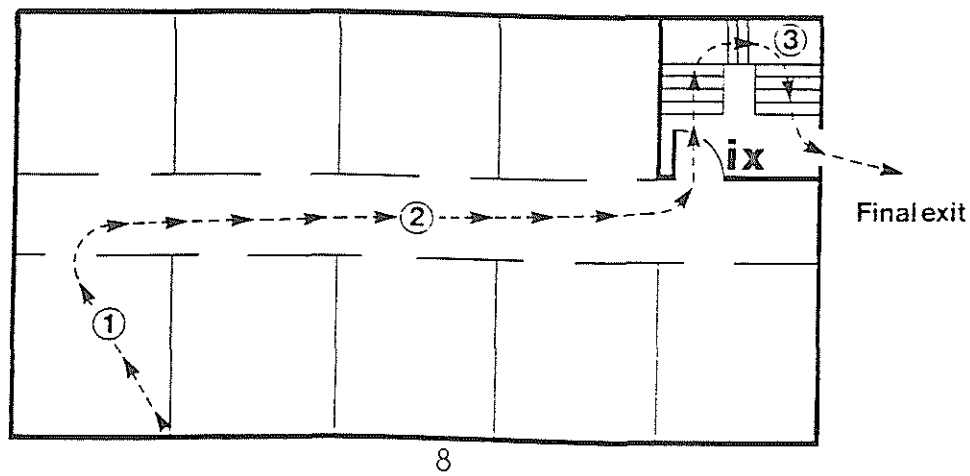
3.3 For the sake of simplicity in a somewhat complex subject, the process of evaluating means of escape and risks facing people leaving is divided by the code into 3 stages, as follows -

Stage 1 (chapter 4) From a point in a room to the exit from the room;

Stage 2 (chapter 5) From the exit from a room to the access into a stairway or, if at ground level, the final exit;

Stage 3 (chapter 6) From the access to a stairway to the final exit.

Diagram 3.3 ((ix) refers to the type of fire door see 7.4)



It should be appreciated that not all these stages will have to be traversed in every case; the exit from a room may, for example, lead directly into the open air, in which case only stage 1 will apply.

PRIMARY DANGER

3.4 Often the primary danger associated with fire in its early stages is not flame or heat but smoke and toxic gases produced by the fire. These may make an escape route impassible long before a temperature which is dangerous to life is reached. Many plastics in common use such as polyurethane or polypropylene are highly toxic when burning. This has therefore to be borne in mind when planning fire precautions.

DEAD END SITUATION

3.5 This is a place from which escape is possible in one direction only, or in directions less than 45 degrees apart that are not separated by fire resisting construction. (See also paragraphs/diagram 4.6 and 6.4.) This may be considered an acceptable risk provided that the distance of travel does not exceed the distance shown in paragraph 3.10, any corridor is of fire resisting construction and any doors giving on to it are fire resisting.

ALTERNATIVE ROUTES

3.6 A fundamental principle is the provision of alternative means of escape. Ideally, it should be possible for a person always to turn his back on a fire and proceed in a safe direction. For this reason it is normally desirable for alternative routes to be available. Thus, in a corridor, the occupier of a room on leaving his doorway may have a choice of turning left or right, and be able to reach safety in either direction.

PROTECTED ROUTES

3.7 These are passages, corridors and stairways which, as the name implies, are protected so that a person using the route can theoretically travel for an indefinite distance without being impeded by the effects of fire. A protected route is, basically, one which is entirely enclosed by fire resisting constructions, with any doors giving on to it (excepting those from a toilet containing no fire risk) being fire resisting and self closing.

TRAVEL DISTANCE

3.8 Travel distance is the term used to denote the distance along a route from any point from which escape may have to be made (and this is, in effect, from any point in a building and taking into account the layout of walls, partitions and fittings) to one or other of the following -

(a) an access to safety in the open air at ground level - the `final exit' (an enclosed space in the open air at ground level may be accepted as a place of safety provided it has ready and safe access to an unenclosed space.);

(b) an access into a protected route (see paragraph 3.7);

(c) an access into an external route;

(d) a door for means of escape in a fire compartment wall.

The maximum recommended travel distance in any circumstances is regulated by the degree of risk offered by the route concerned. For instance, distance of travel down a protected stairway or an external one can be indefinite and is therefore not measured. However, on a route where the stairway has habitable rooms opening on to it, even though their doors are fire resisting, the risk is higher and travel distance must be restricted. Finally, on a route involving an open staircase, ie one not separated from rooms or corridors by fire resisting doors, a very short distance of travel is specified.

ESCAPE CRITERIA

3.9 The speed of travel of persons escaping from a fire to a place of safety is assumed as 12 metres per minute. This speed is considerably slower than a normal walking pace, but takes account of the loss of mobility that can occur in the vicinity of fire and smoke. Escape from a room is based on a flow rate of 40 persons per minute out of a unit width exit measuring 0.53 metres. (This does not imply that doors may be that narrow, but is based on a normal shoulder width.) Travel distances are based on an evacuation time of 2.5 minutes to a place of safety for normal risk premises. (Distances are decreased for high risks and increased for low risks.)

TABLE OF TRAVEL DISTANCES

3.10 Distance of travel should not generally exceed, as appropriate, the distance shown in the following table.

DISTANCE OF TRAVEL IN METRES

Types of premises	FACTORY			SHOP		OFFICE
Category of fire risk	high	normal	low	high	normal	normal
A WITHIN A ROOM ENCLOSURE						
i. In 1 direction only	6	12	25	6	12	12
ii. In more than 1 direction	12	25	*	12	*	*
B FROM ANY POINT IN AN INNER ROOM TO THE EXIT FROM THE ACCESS ROOM	6	12	25	6	12	12
C TOTAL DISTANCE OF TRAVEL						
i. In 1 direction only	12	25	45	12	18	18
ii. In more than 1 direction	25	45	60	25	30	45

* The distances in line Ai above in respect of high and normal risks in factories and for high risks in shops would generally prove to be acceptable if they are doubled for the purpose of line Aii. In the case of low risks in factories and normal risks in shops and offices, the distances of travel for the purposes of line Aii should be assessed in accordance with the circumstances presented.

3.11 In many instances when applying the recommendations on distances of travel to reach a place of safety, particularly in a premises where an open storey floor discharges directly into a stairway which is a protected route, or in a ground storey only, where the whole floor area is undivided and which has final exits, it will be appropriate to consider only the one distance, ie the 'total distance of travel' dealt with in section C of the above table.

TRIPPING HAZARDS

3.12 Any fault which would cause someone to trip while attempting to escape from fire could be disastrous. Therefore, loose or worn items, such as carpets, floorboards, stair banisters etc, should be repaired or replaced. Too steep/shallow or uneven staircases could also be hazardous.

MAINTENANCE OF ESCAPE ROUTES

3.13 Escape routes should be kept free from obstructions and combustible materials at all times, and notices to this effect should be displayed in those parts of the escape routes which could present convenient storage areas, eg under stair open spaces.

4. STAGE 1 TRAVEL WITHIN ROOMS

SMALL ROOMS (of less than 30 sq m)

4.1 If a fire starts in a small room the number of occupants will be so small and the distance to the doorway so short that there is little risk that the occupants will not be able to escape through a single doorway. In this case, a second way out is not usually necessary.

LARGE ROOMS (of more than 30 sq m)

4.2 In a large room there is always a risk of confusion should a fire break out because of the greater number of persons who may be involved. There is also a greater risk that a fire breaking out within the room may trap some of the occupants unless there is an alternative exit. For this reason large rooms should usually have more than one exit (see also paragraph 4.4).

DISTANCE OF TRAVEL

4.3 The factors which have to be considered when assessing means of escape will vary widely from one set of premises to another. Accordingly the distances suggested in the following paragraphs should be regarded as guidelines and not as hard and fast limits. There are likely to be many situations at both ends of the scale in which either reductions are necessary or increases are possible (see also paragraphs 3.8 and 3.10).

NUMBER OF EXITS

4.4 More than one exit will be required in the following situations -

(a) if a room is to be occupied by more than 60 persons;

(b) if the distance to be travelled between any point and the only exit is more than the appropriate distance recommended in line A(i) of paragraph 3.10;

(c) from a room which is an area of high fire risk, except that one exit may be satisfactory if the maximum distance is not greater than 6m, and the hazard that causes the room to be high risk can be confined with certainty to the end of the room remote from the single exit.

WIDTH OF EXITS

4.5 (a) The clear width of an exit should normally not be less than 750mm unless the exit will be used by fewer than five persons;

(b) Where it is necessary to have more than one exit for means of escape purposes, the aggregate width of all exits less any one of them should not be less than -

(i) 750mm for up to 100 persons;

(ii) 1.05m for up to 200 persons and an additional 75mm for each additional 15 or part of 15 persons.

SITING OF EXITS

4.6 In a room or enclosure requiring more than one exit the exits will be satisfactorily sited if, from any point in the room further than the distances recommended in paragraph 3.10 A(ii) or B to the nearest exit, the angle between lines defining the routes to the alternative exits is not less than 45 degrees (see diagram 4.6 where door Y would be unsuitable).

diagram 4.6

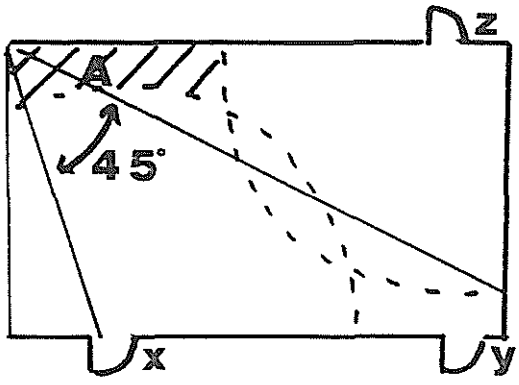
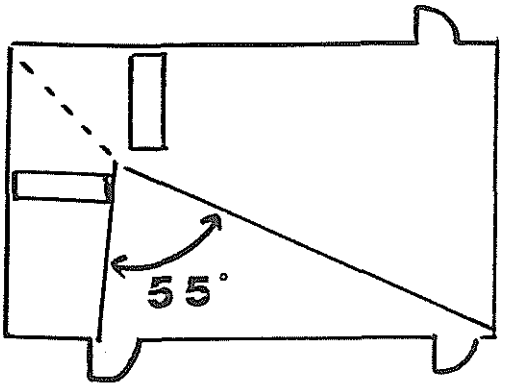


diagram 4.7



(A) = any distance over that recommended in paragraph 3.10 A or B

4.7 If the room or furniture layout means that the route of travel is initially in one direction only, (also inner room situation see paragraphs 4.9 and 4.10) then 2.5 degrees should be added for each metre travelled in that one direction. eg 4 metres = 10 degrees extra therefore the angle defined in paragraph 4.6 should not be less than 55 degrees (see diagram 4.7).

GANGWAYS AND PASSAGEWAYS

4.8 The contents of any room in which persons are working or any area to which the public is admitted should be so arranged or disposed that there is a free passageway for all persons to a means of escape in case of fire. Often in factories the layout of benches, plant etc within work spaces will be such as to delineate gangways clearly. Where this is not the case, and particularly in large shop sales floor areas where the random display of goods could encroach onto required gangways, it may be necessary to ensure that they are clearly defined by, for example, painting lines on the floor, as circumstances may demand, or, where the spaces to be reserved as gangways may periodically change, by delineating with some other durable but non-permanent marking.

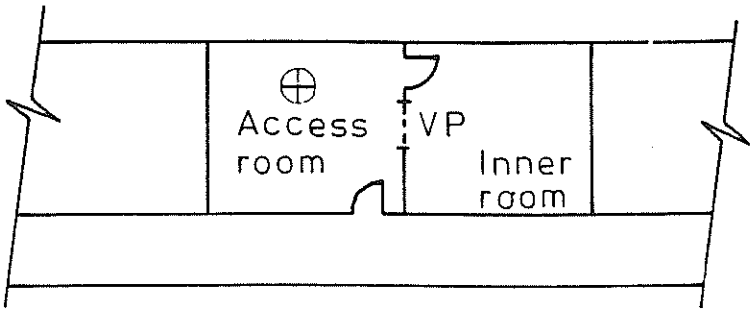
INNER AND ACCESS ROOMS (including enclosures)

4.9 Where a room is an inner room, ie a room only accessible through an access room, the distance from any point in the inner room through the communicating door to the exit from the access room should not generally exceed the appropriate distances given in line B of paragraph 3.10.

Notes (i) An access room should not be an area of high fire risk. (See paragraph 2.4)

(ii) Normally an observation panel (or similar facility) should be provided in a suitable position between the access room and an inner room so that people will become aware of any problem occurring in the access room. This may be omitted, however, if automatic fire detection, in the form of smoke sensors, is installed in the access room.

diagram 4.9



4.10 The travel distances referred to in paragraph 4.9 above for both rooms combined, may be increased to those shown in 3.10 A(ii) if, at the exit from the inner room, there is escape in more than one direction from the access room (but see paragraph 4.6).

TRAVEL THROUGH DIFFERING RISKS

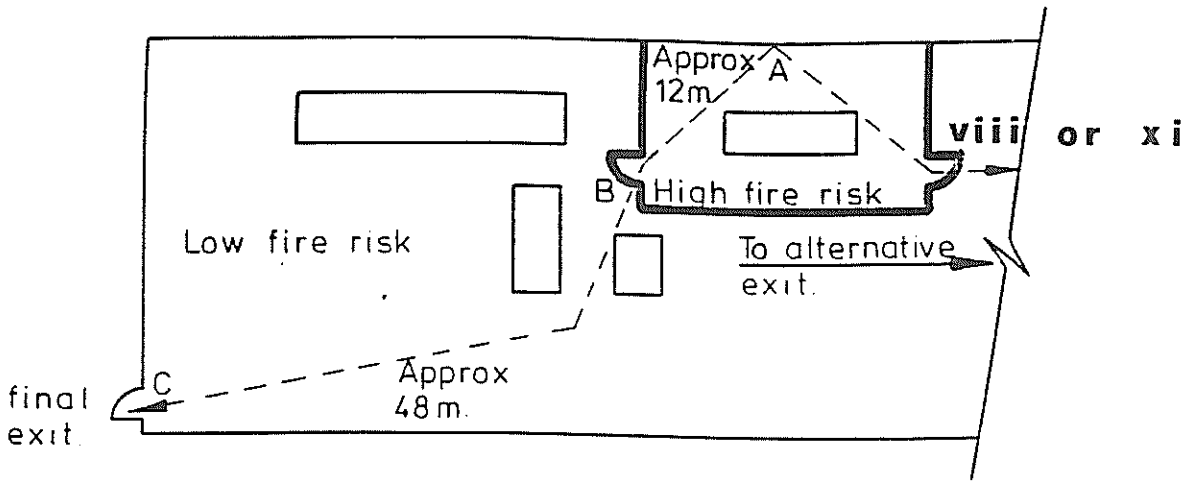
4.11 In cases where more than one stage of escape exists or where, for example, part of an escape route is within a room and the remainder is within another adjoining room, the recommended distances should be applied according to the assessment of the risk in each of the rooms.

Diagram 4.11 gives an example of a factory in which escape is possible in more than one direction. The first part of the route is in a room assessed as 'high risk' and the second is within a part judged to be 'low'. This would mean that the distance should be limited in the first room (A - B) to 12m (paragraph 3.10 A(ii)) and in the second (B - C) to 48m. This is because the total distance shown in line C(ii) for a low risk factory is 60 m and therefore is the balance necessary to give the total distance recommended for that 'low' category of risk.

(If say the A - B distance was 8m, then the B - C distance could be 52m.)

NOTE : Escape from a 'low' or 'normal' risk area should not pass through a 'high' risk area.

diagram 4.11 (viii or xi refer to the type of fire door, see 7.4)



OPEN PLAN AREAS

4.12 Open plan areas which serve any room can better be described as an access room and paragraphs 4.9 and 4.10 therefore apply.

4.13 The risk of smoke and heat spreading horizontally is greatly increased with open plan floors, where areas are not separated by floor to ceiling walls. With open plans it may of course, be possible to raise the alarm quickly and to escape in several directions away from the source of outbreak. However it will be important to check on the length of the escape routes across the open area and to ensure that, in the case of large spaces, alternative routes are available. In this connection, the furnishing of open plan areas poses several problems as does the positioning of moveable partitioning.

If the escape route is in one direction only, any openings that are not fire resisting should not be sited within 3 metres of the route.

5. STAGE 2 - TRAVEL FROM ROOMS TO A STAIRWAY OR FINAL EXIT

CORRIDORS

5.1 If a fire starting in a small room spreads from that room to a main corridor, the occupants of the room in which the fire originates may find no difficulty in escaping. However , there is a risk that smoke may enter the corridor through the open door in such quantities as to cut off the escape of occupants of the other rooms. As a fire may break out in any of the rooms, it is desirable that escape should be possible along the corridor in either direction. As a general rule, therefore, on all floors above the ground floor, corridors should lead to at least two stairways placed well apart.

DEAD ENDS

5.2 In corridors where escape is in one direction only, the route should be a protected route (see paragraph 3.7) unless -

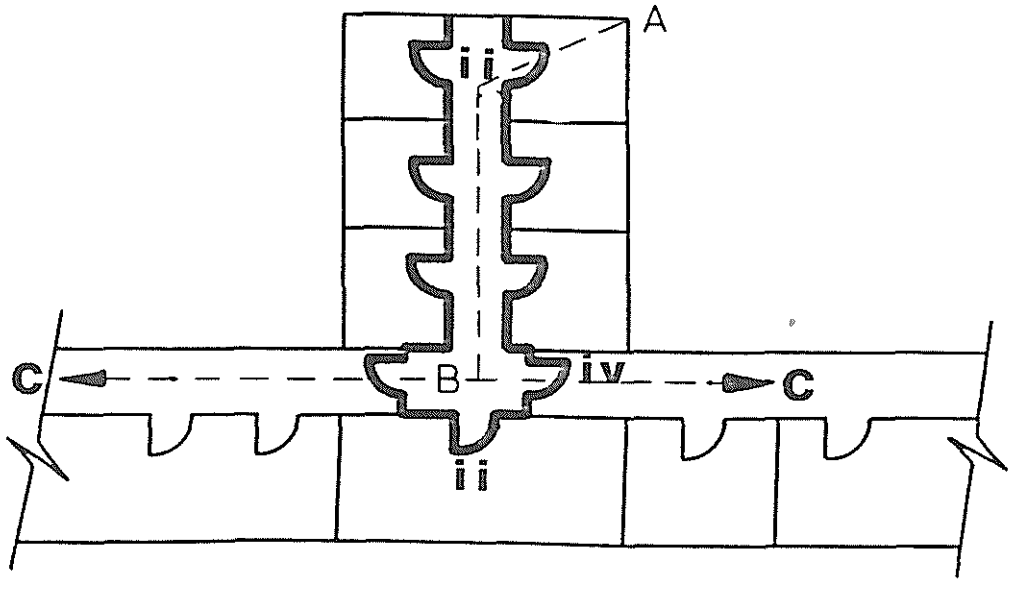
(a) it leads to a final exit, within the recommended distance of travel as shown in line C(i) of paragraph 3.10 AND

(b) the fire risk and associated life risk assessment throughout the route is low.

Therefore, any other room or cupboard which has to be passed in order to reach safety should have fire resisting walls and doors. (Excepting doors from toilets etc containing no fire risk.)

diagram 5.3

A to B not to exceed distance shown in paragraph 3. 10 line C i
A to nearest C not to exceed distance shown in 3.10 line C ii
(C = protected stairway, door in compartment wall or final exit)
(ii or iv refer to the type of fire door, see 7.4)



DEAD END INTO ALTERNATIVE

5.3 Where a corridor is required to be protected, as above, and consists initially of a dead end and then has alternative routes, where both sections of the corridor join, they should be separated by fire-resisting construction. The distance that a person should travel from any point within the dead end to reach that junction should not exceed the distance recommended in line C(i) of paragraph 3.10 (See diagram 5.3).

ALTERNATIVE ESCAPE ROUTES

5.4 (a) If the storey is divided into separate fire compartments, escape can be via a separate fire compartment, if that compartment has an alternative escape route. If there is no other compartment to the storey, escape can be -

(b) via a protected stairway;

(c) protected lobby leading to a stairway; or

(d) on the ground floor, a final exit.

Ground floor rooms may additionally have separate exits to the open air as means of escape, in which case the limiting distances for means of escape in corridors need not apply to those rooms.

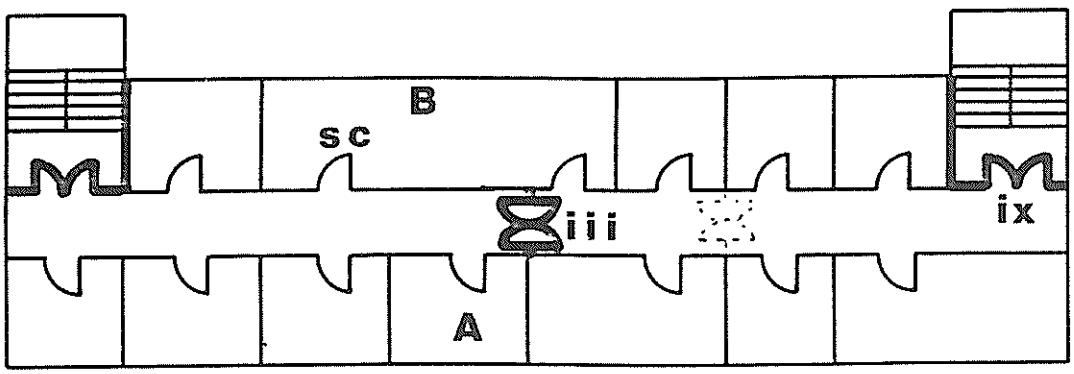
WIDTH OF CORRIDORS

5.5 A main corridor should not normally be less than 1.05m wide.

LONG CORRIDORS

5.6 Corridors exceeding 30m in length in shop and factory premises, or 45m in office premises, should be sub-divided by fire doors to prevent the free travel of smoke and products of combustion throughout the length of the corridor. Doors provided for the sole purpose of restricting the passage of smoke need not be fire doors provided that they are fitted with suitable smoke seals, are of substantial construction and self closing and double swing as necessary. Care should be taken to ensure that smoke cannot readily by-pass these doors (see diagram 5.6).

diagram 5.6 (iii or ix refer to the type of fire door, see 7.4)



NOTES - (a) persons escaping from room A have to pass a door from room B, therefore, the door shown SC (self closing) should also be fire resisting;

(b) if travel distances allow, the dotted alternative position shown would be better as it lines up with the room walls.

INTERCOMMUNICATION BETWEEN ROOMS

5.7 It may be necessary to provide means of escape by way of intercommunicating openings between adjoining rooms or adjoining buildings. Normally, this should be done by providing a doorway having the minimum width appropriate to the circumstances (see paragraph 4.5) and also having, where necessary, a door of the requisite degree of fire resistance (see paragraph 7.4). Where intercommunication in this way between different occupancies is being considered it will be necessary to check that a binding agreement is in force between all interested parties so that the use of the route will be available at all appropriate times, particularly if the different occupancies use their premises at different times.

BALCONIES, BRIDGES, WALKWAYS etc

5.8 Structures of this kind can provide suitable escape routes. In all cases it will be necessary to ensure that they can be used safely by providing, as appropriate, guard rails, hand rails, toe boards, etc. It may also be necessary to incorporate measures to protect persons using the route against the effects of fire (eg flames and radiated heat from an opening in a wall adjacent to a balcony or bridge). Depending upon the circumstances weather protection and escape lighting (see chapter 11) may also be required.

6. STAGE 3 - TRAVEL WITHIN STAIRWAYS TO A FINAL EXIT

STAIRWAY CONSTRUCTION

6.1 Where a fire starts in a stairway it will quickly make the stairway unusable by the occupants of all the floors above the point of origin of the fire. They may find it possible to escape by some other route, but smoke and fire rise rapidly through any openings in the floors and may quickly spread to the upper floors. All stairways, therefore, should be constructed in such a way that an outbreak of fire is virtually impossible and combustible material within protected stairways should be minimised.

6.2 The principles and procedures outlined in chapter 5 enables horizontal escape routes to be so designed and constructed as to ensure that nobody will be trapped on a floor by a fire spreading horizontally. It now remains to consider what is needed to ensure that the occupants of all the floors above the ground will be able to reach the final exit in safety. This entails studying the risk of a fire on any lower floor spreading to a stairway and cutting off that escape route from the upper floors.

STAIRWAY ARRANGEMENT ABOVE GROUND FLOOR LEVEL

6.3 In the plan shown in diagram 6.3 (a) a fire starting in one room can spread along the corridor and enter both stairways. Although the occupants of the rooms on this floor should have been able to escape before the fire reached these dimensions (the plan conforms with the principles deduced when studying stages 1 and 2) it cannot be assumed that the occupants of the floor or floors above will have escaped in the same time. Should their movements be delayed it is clear that both their escape routes to the ground will be cut off by smoke and subsequently fire spreading up stairways and other vertical shafts. In order to reduce this risk to a minimum it is essential that stairways be protected (see diagram 6.3 (b)). A fire within or affecting a stairway will render it unusable for means of escape. For this reason one stairway is discounted for calculating numbers of stairways and stairway widths.

diagram 6.3 (a) (faulty)

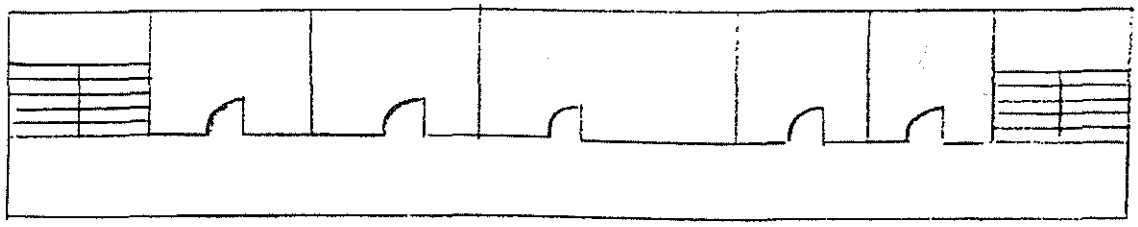
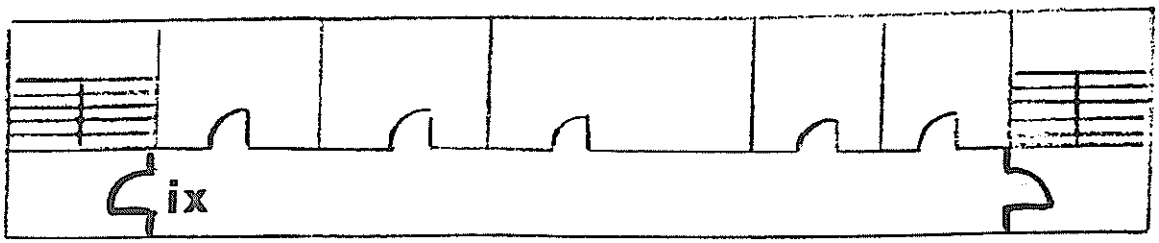


diagram 6.3 (b)



(ix refers to the type of fire door, see 7.4)

FAULTY PLANNING

6.4 Diagram 6.4 (a) shows how fire passing up the stairway next to the dead end corridor may trap the occupants of the rooms in the dead end. As a general principle, the stairway enclosure on upper floors should be arranged so that any part of a horizontal escape route which forms the sole means of escape from any portion of a building does not pass through the enclosure. The remedies for the faults illustrated are shown in diagram 6.4 (b) and (c). It is in any event good practice to ensure that horizontal circulation routes allow protected stairways to be by-passed; this is essential in the design of new construction. Another alternative is (where applicable) to upgrade the standard of that portion of the building to that required for a single staircase building.

diagram 6.4 (a) (faulty)

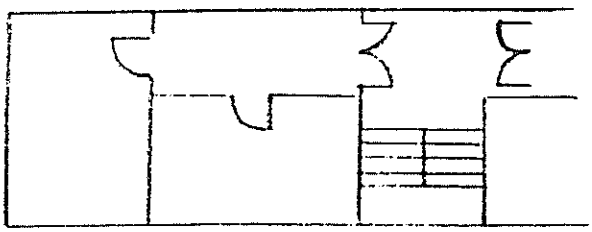
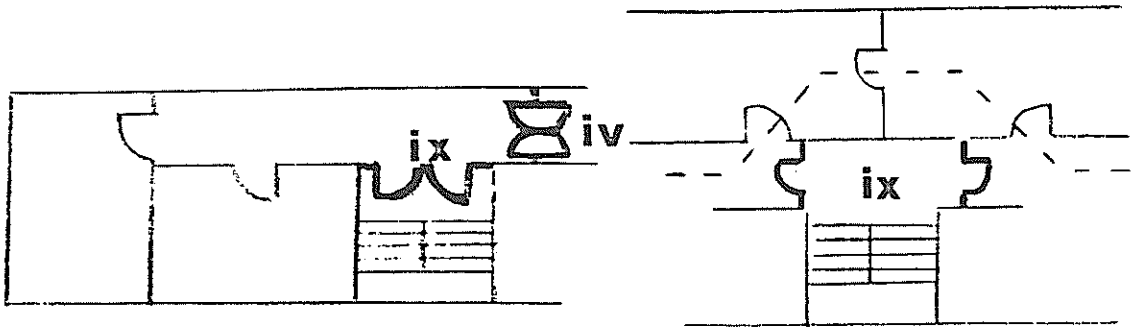


diagram 6.4 (b)

diagram 6.4 (c)



(iv or ix refer to the type of fire door, see 7.4)

FIRE/SMOKE SPREAD

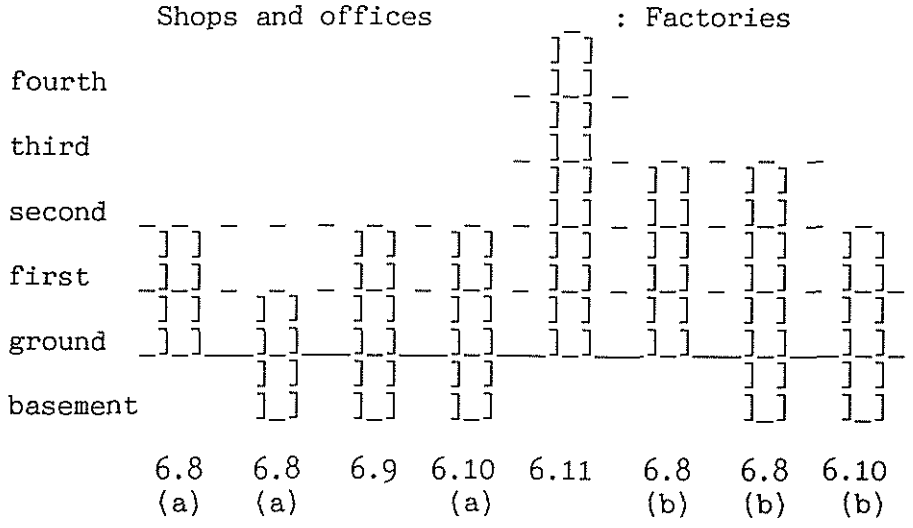
6.5 Some of the measures recommended in regard to the means of escape and those suggested for lift wells and hoists will assist in restricting the spread of fire and smoke, particularly by way of vertical shafts between floors. However, in industrial buildings it is often impractical to provide fire resisting separation between floor levels and unprotected openings for items of plant, ducting, trunking and similar features associated with the processes being carried on have to be accepted. Where this is the case it will always be necessary to assess the means of escape needs having proper regard to the greater possibility of fire and smoke spread in such circumstances.

ARRANGEMENT OF GROUND FLOOR EXITS FROM STAIRWAY ENCLOSURES

6.6 A critical point in any escape route from buildings of more than one storey will be the way from the bottom of a stairway to the open air. All persons descending from upper floors and often those leaving the ground floor, converge upon and pass through this area. A fire spreading to it will make a whole escape route from every floor useless. The simplest and safest precautions against such a risk is to provide a protected stairway enclosure which, in the ground floor, has a doorway leading directly to the open air and which, except for the minimum numbers of doors opening from the horizontal circulation area, is otherwise completely shut off (see diagram 6.12 (a)).

NUMBER OF STAIRWAYS

diagram 6.7



For mezzanine floors see paragraphs 6.8 (c) and (d).

BUILDINGS WITH A SINGLE STAIRWAY

6.7 It will normally be advisable for a building to be provided with two or more stairways, but a single stairway of suitable capacity for the number of persons using the route may be considered satisfactory in the circumstances described below. Diagram 6.7 shows the storey height and relevant paragraphs for these buildings.

UNPROTECTED STAIRWAY

6.8 (a) NORMAL RISK SHOPS AND OFFICES with no floor area in excess of 90 sq m, with no more than 2 floors one of which may be a basement may be unprotected if -

(i) the exit from each floor is clearly visible;

(ii) it discharges not more than 3m from a final exit;

(iii) a restaurant or licensed bar is not included;

(iv) the total distance of travel does not exceed 18m;

(v) any basement floor is not more than 3.5m below ground floor level (see diagram 6.8 (a)).

diagram 6.8 (a)

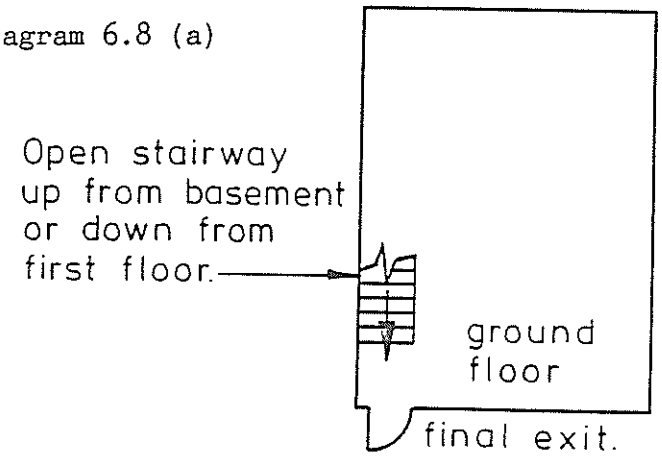
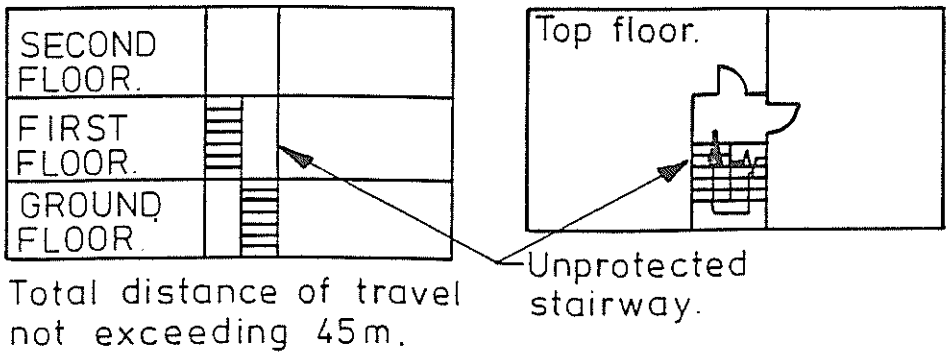


diagram 6.8 (b)



6.8(b) LOW RISK FACTORIES if there are not more than two floors above the ground floor (If a basement is provided paragraphs 6.22 to 6.24 should be consulted.) (see diagram 6.8 (b)).

6.8(c) OPEN STORAGE MEZZANINES may be acceptable with a single open staircase provided -

(i) the travel distance across the mezzanine to the head of the stairs does not exceed 12 metres;

(ii) there is easy access to a fire exit or door in a fire resisting wall from the foot of the staircase;

(iii) the ground floor does not constitute a high fire risk.

6.8(d) MEZZANINES USED AS OFFICES may only be used as such with a single staircase provided -

(i) the area of the mezzanine is not more than 25% of the ground floor area into which it discharges;

(ii) not more than 10 persons normally resort to the first floor;

(iii) the bottom of the stairway is not more than 3m from a final exit;

(iv) the distance from the furthest point on the mezzanine to the final exit does not exceed 18m;

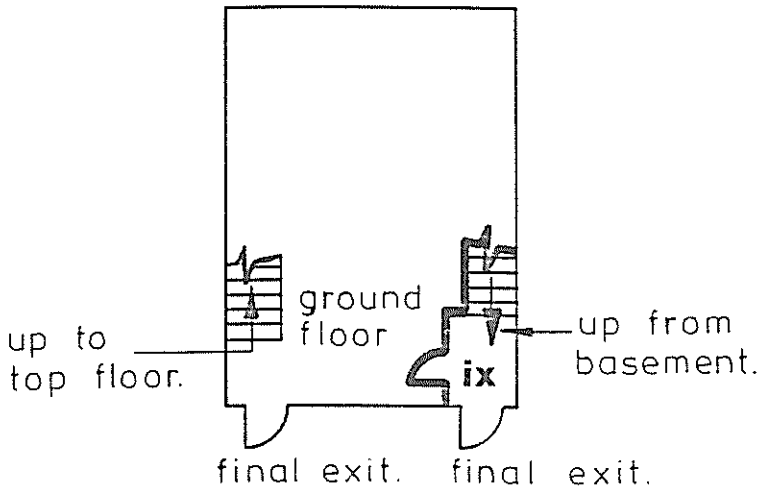
(v) the ground floor does not contain a high fire risk;

(vi) the mezzanine should be open or clear glazed (this is to ensure that any hazard occurring within the main building will be observed).

PARTLY PROTECTED STAIRWAY

6.9 Normal risk SHOPS AND OFFICES with no floor area in excess of 90 sq m, with no more than three floors, one of which is a basement requires protection to either the basement or the first floor stairway at ground floor level. This should be enclosed with fire resisting construction and discharge to a final exit which is independent and separate from the ground floor. The recommendations in 6.7 (i,iii and iv) above also apply (see diagram 6.9.).

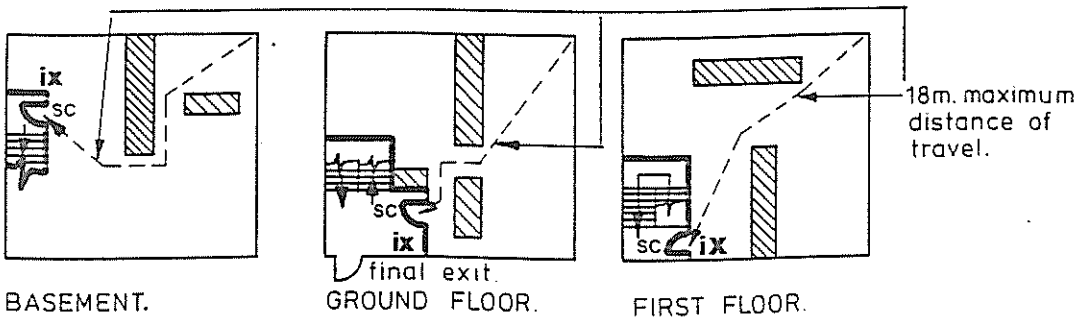
diagram 6.9 (ix refers to the type of fire door, see 7.4)



PROTECTED STAIRWAY

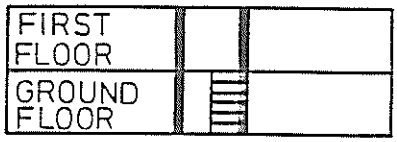
6.10 (a) Normal risk SHOPS AND OFFICES with no floor area in excess of 280 sq m, with no more than a basement, ground and first floors, should be enclosed with fire resisting construction and discharge to a final exit independent of, and separate from the ground floor (see diagram 6.10 (a)).

diagram 6.10 (a) (ix refers to the type of fire door, see 7.4)



6.10 (b) Normal risk FACTORIES with not more than one floor above the ground floor, the stairway should be enclosed with fire resisting construction. If a basement is provided paragraphs 6.22 to 6.24 should be consulted (see diagram 6.10 (b)).

diagram 6.10 (b)

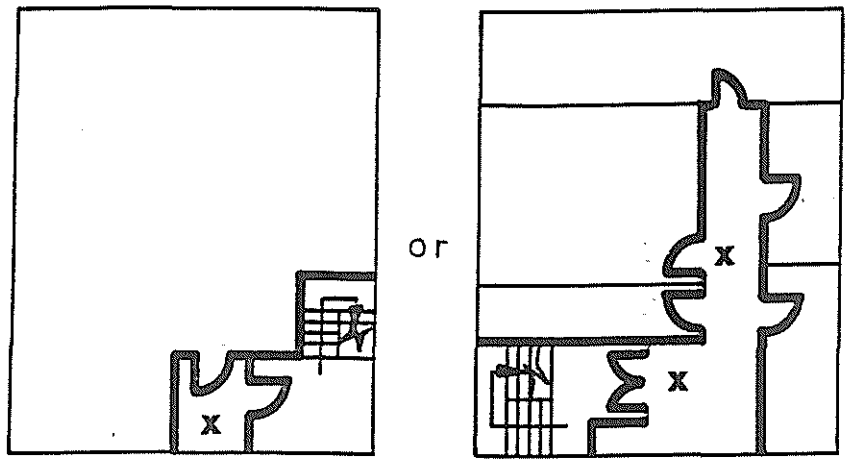


Total distance of travel 25m.

LOBBY PROTECTED STAIRWAY

6.11 A normal risk SHOP OR OFFICE with no floor area in excess of 280 sq m, and is not more than four floors above the ground floor should be protected by a protected lobby/or corridor (other than the top floor (which still requires single door protection) or a toilet containing no fire risk) (see diagram 6.11).

diagram 6.11 (x refers to the type of fire door, see 7.4)



Where it is impracticable to achieve two door protection as above in like premises with not more than two floors above the ground floor, the stairway should be protected (as 6.9) and suitable automatic fire detection arrangements provided in the building.

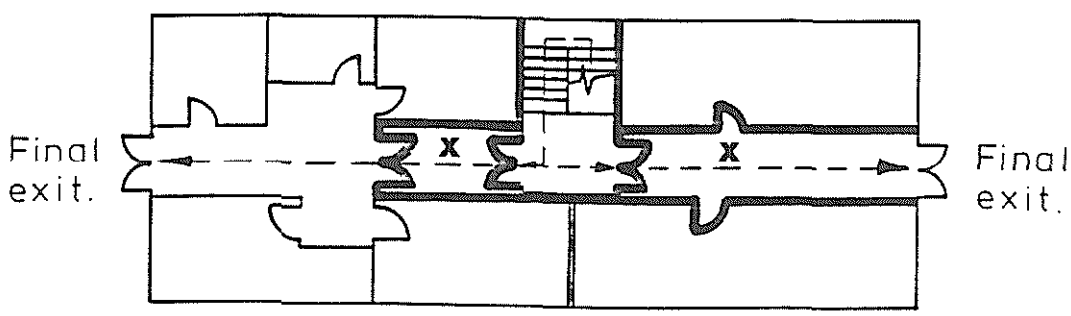
NOTE - a protected lobby provides, as it were, an "air lock" between the normal accommodation in the building and the staircase as an extra safeguard to prevent smoke and heat from a fire reaching the staircase, remembering that people will have to descend the staircase from upper floors past the floor on which the fire has occurred.

STAIRWAY WITHOUT FINAL EXIT

6.12 Ideally stairway enclosures should lead direct to a final exit. Where there is only one stairway from the upper floor(s) of a building and a final exit cannot be provided from the stairway enclosure, one of the following arrangements should be adopted -

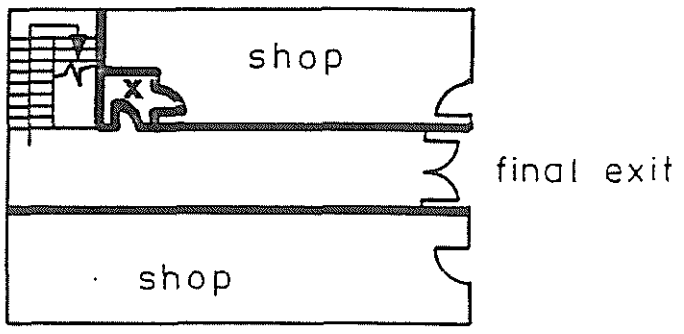
(a) the provision of two exits from the stairway enclosure each giving access to final exits by way of routes separated from each other by fire resisting construction (see diagram 6.12 (a));

diagram 6.12 (a) (x refers to the type of fire door, see 7.4)



(b) there should be a protected route from the stairway to a final exit (see diagram 6.12 (b)).

diagram 6.12 (b) (x refers to the type of fire door, see 7.4)



MULTI STAIRWAY BUILDINGS

6.13 There should be two or more stairways for means of escape in all other buildings, apart from exceptional cases, which require protection as follows in paragraphs 6.15 to 6.22.

WIDTH OF STAIRWAYS

6.14 As a general rule stairway should be at least 750mm wide and in all cases the aggregate width of stairways should be sufficient for the number of persons likely to have to use them at the time of a fire. In this connection it will be necessary to consider the possibility of one stairway being inaccessible because of the fire and the aggregate width must allow for this possible reduction. Figures in paragraph 4.5 will also apply.

ENCLOSURE OF STAIRWAYS

HIGH AND NORMAL RISK BUILDINGS

6.15 With the exception of stairway arrangements in buildings described in paragraphs 6.8 and 6.9 all other stairways in buildings of high or normal risk should be separated from the remainder of the building by fire resisting construction and by fire doors unless -

(a) the stairway is an accommodation stairway (see paragraph 6.25); or

(b) in the case of a FACTORY, the stairway forms an alternative escape route which is not the only escape route from the building (or part of the building); AND has not more than one floor above the ground floor.

LOW RISK FACTORY

6.16 In a building (or part of a building) which is a factory of low risk, any stairway which serves more than two floors above the ground floor should be separated from the remainder of the building by fire resisting construction and by fire doors.

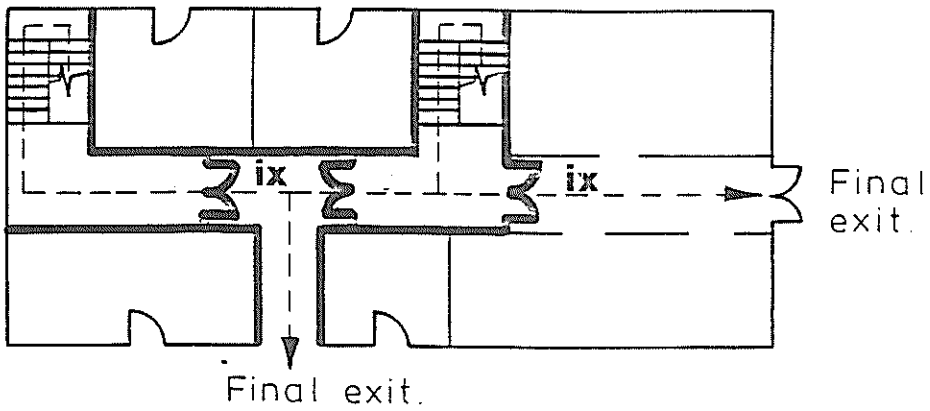
BY-PASS ROUTE

6.17 Stairway separation should be so arranged that a person need not pass through the stairway enclosure to reach an alternative route. If this is impossible then the stairway should still be separated and it may be reasonable to provide a by-pass route around the stairway by means of intercommunicating doors between adjoining rooms or by means of balconies (see paragraphs 5.7 and 5.8 and diagram 6.4 (b)).

SEPARATION OF STAIRWAYS

6.18 Where from an upper floor(s) of a building there is more than one stairway, which is required by paragraphs 6.15 and 6.16 to be separated from the remainder of the building, and the stairways do not have final exits from the stairway enclosures, the stairways and the routes to their respective final exits should be separated from one another by fire resisting construction and fire doors in such a way that an outbreak of fire at any point cannot affect more than one escape route from the stairways (see diagram 6.18).

diagram 6.18 (ix refers to the type of fire door, see 7.4)



HIGH RISE BUILDINGS

6.19 In any -

(a) FACTORY building having any floor more than 18 m above ground level; or in any

(b) OFFICE OR SHOP building having any floor more than 24m above ground level;

the only doors into a stairway should be -

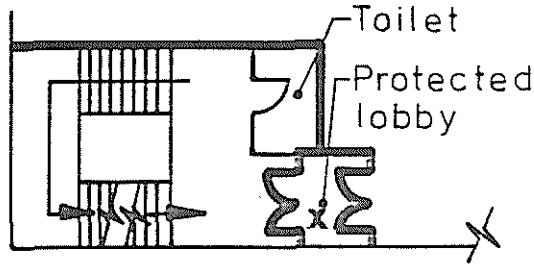
(i) from toilets containing no fire risk;

(ii) from protected lobbies;

(iii) from lift wells contained within a stairway enclosure;

(iv) a final exit (see diagram 6.19).

diagram 6.19 (x refers to the type of fire door, see 7.4)



Stairway with a final exit accepted as a protected route.

TRAVEL DISTANCES

6.20 Where a stairway can be considered to be a protected route it will not be necessary to have regard to the distance of travel in stage 3. Where this is not the case, however, the stage 3 section of the escape route may be regarded as forming part of the total permitted distance of travel (see 3.10(c)) provided that in a multi-occupancy building the route is protected from each individual occupancy, or in the case of a single occupancy, the route is protected by fire resisting constructions from any area which is deemed to be a high fire risk.

MULTI-PURPOSE USE

6.21 In a building which is in multi-purpose use, where stairways are common to all occupancies, the standard of fire protection of the stairways will be determined by the occupancy which requires the higher standard. For example, in a building in which there are four floors above the ground floor and there is a factory occupying the basement, ground and first floor with offices above, the stairways would need to conform to the recommendations contained in paragraph 6.15 regardless of the fact that the factory premises do not exceed more than one floor above the ground floor specifically mentioned in paragraph 6.15 (b).

STAIRWAYS TO BASEMENTS

6.22 If the distance of travel from any point in the basement exceeds that given in line C(i) of 3.10 the basement should have at least two stairways or other approved escape routes to a place of safety at ground level.

6.23 In all buildings other than those dealt with in paragraphs 6.8 to 6.11 it is preferable that a stairway serving upper floors should not extend to the basement, and wherever possible all stairways to basements should be entered at ground level from open air, and in such positions that smoke from any fire would not obstruct any exit serving the upper floors of the building. Where the stairway links a basement with the ground floor the basement should be separated from the ground floor preferably by two 30 minute fire doors, one at basement and one at ground floor level.

6.24 In the case of a FACTORY building, exceptionally the basement may be separated by one 60 minute fire door at ground level or where the basement is small, and does not present a high fire risk, one 30 minute fire door separating the basement from the ground floor may be acceptable.

ACCOMMODATION STAIRWAY

6.25 Accommodation stairways are additional to that or those required for escape purposes and are provided for the convenience of occupants.

These need not be separated from the remainder of the building provided that -

(a) the means of escape are sufficient without relying on the accommodation stairway;

(b) no escape route from a dead end of an upper floor passes through an accommodation stairway (see also paragraph 8.6 in relation to other floor openings);

(c) the stairways do not pass from one compartment to another;

(d) no such stairway serves more than two floors; and

(v) neither of the floors is connected by an open stairway to a third floor.

VENTILATION

6.26 Wherever practicable, there should be provision for ventilating stairways in the event of fire, particularly if the stairway enclosure is not adjacent to an external wall which has openable windows, and the stairway continues uninterrupted to the top of the building. The minimum area of permanent or openable venting generally acceptable is considered to be no less than 1 sq m or 5% of the internal area of the stairway enclosure whichever is the greater.

ITEMS UNACCEPTABLE WITHIN STAIRWAYS

6.27 The following items should not be permitted within stairway enclosures -

(a) portable heaters of any type;
(b) heaters which have unprotected naked flames or radiant bars;
(c) mixed heaters using a gas supply cylinder;
(d) oil filled heaters;
(e) cooking appliances;
(f) upholstered furniture;
(g) wardrobes or other storage furniture;
(h) coat racks;
(i) storage of any kind;
(j) lighting involving the use of naked flame;
(k) gas meters other than those installed in accordance with appropriate gas safety regulations.

OTHER FORMS OF ESCAPE FROM HEIGHT (WITH LIMITATIONS)

ESCALATORS

6.28 Escalators are not normally acceptable as a means of escape.

6.29 Escalators not within stairway enclosures may need to be separated from the remainder of the building by fire resisting construction and by fire doors. However, in certain premises, eg shops, it may be reasonable to regard them as similar to accommodation stairways (see paragraph 6.25).

6.30 To avoid a situation where persons on an escalator are carried towards a fire it is important that escalators should be so arranged to stop immediately in the event of a emergency.

EXTERNAL STAIRWAYS

6.31 Where there is an external stairway it should be a protected route and it will therefore be necessary to ensure that the use of it at the time of a fire cannot be prejudiced by smoke and flames issuing from openings (eg windows, doors) in the external wall of the building below and adjacent to the stairway. Protection of the stairway from the weather should also be considered. For further information see Guernsey Fire Brigade appendix FP6.

SPIRAL STAIRWAYS

6.32 Existing spiral stairways are acceptable only in exceptional situations eg for use by not more than 50 able-bodied adults who are not members of the public. The stairway should not be more than 9m in height, and no less than 1.5m in diameter.

OTHER LADDER DEVICES

6.33 Portable ladders and throw out type ladders are not suitable for means of escape purposes for members of the public. However, there may be some work situations in which it will be reasonable to place reliance upon ladders of this kind to provide escape for one or two able-bodied and agile persons eg from an item of high level plant or from an overhead travelling crane or hoist in a factory.

6.34 Fixed vertical or raking ladders suitably guarded are not acceptable for use by members of the public. They are only acceptable for use by limited numbers of persons who are able-bodied and active enough to be able to negotiate them without difficulty. Particularly where such ladders form the means for gaining access to plant or machinery rooms it will, of course, be reasonable to accept them for means of escape purposes for persons who are expected to use them in normal circumstances. In most cases where vertical ladders are accepted, the total descent by such means should not generally exceed about 9m.

LOWERING LINES

6.35 Automatic lowering lines and other manipulative emergency devices for self-rescue should be contemplated only in very exceptional circumstances, for example, to afford some alternative emergency arrangement in factory premises for one able-bodied person who could be trained in the use of the device and who is required to work in an isolated position where it would be unreasonable to look for conventional routes of escape. Lowering lines are not suitable for use by members of the public.

RAMPS

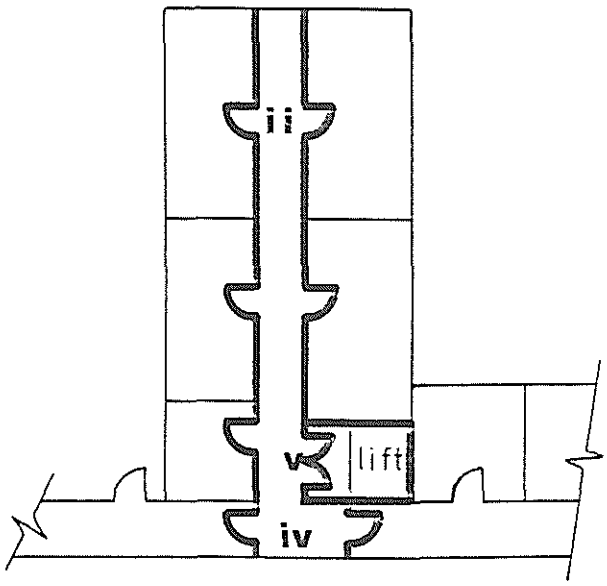
6.36 Where a ramp is provided it should have an easy gradient and in no case should it be steeper than 1 in 12. Handrails and non-slip surfaces should be provided to guard against a person slipping. This will be particularly necessary where a ramp is exposed to the weather.

LIFTS

6.37 Lifts and hoists are not normally acceptable for means of escape. Exceptionally, however, when it is necessary to consider means of escape for persons in the premises who may be disabled, the use of a lift(s) should not be ruled out provided the appropriate provisions of British Standard 5588 : Part 8 are complied with.

6.38 Unless a lift is situated within a stairway enclosure which is a protected route and is entered from the stairway only, it should be contained within a lift well enclosure of fire resisting construction in which the access doors are fire doors. Existing sliding doors to lift shaft openings are sometimes ill fitting in their slides and frames and offer a poor barrier to the passage of smoke. In such cases where the opening discharges into a corridor which is a dead end, a protected lobby should be provided at the entrance to the lift. A person should not have to pass through the lobby to reach the continuing route of escape beyond (see diagram 6.38).

diagram 6.38 (ii,iv and v refer to the type of fire door, see 7.4)



6.39 A lift motor situated at the foot of a lift well which is within the enclosure of a stairway which is a protected route and forms the only escape route from a building (or part of a building) should be housed in a compartment separated from the lift well by fire resisting construction. Any opening necessary in the separation between the compartment and the well for the operation of the lift should be as small as possible.

6.40 Where practicable, a lift well should have a permanent ventilation at the top equal to not less than 0.1 sq m for each lift in the lift well enclosure.

WALL AND FLOOR HATCHES

6.41 Only in exceptional circumstances should it be necessary to rely for means of escape on wall hatches (including breakout panels) and floor hatches. However, there may be some instances when, because of structural difficulties, it will be reasonable to accept arrangements of this kind for a very limited number of persons who are active enough to use them, but under no circumstances should they be provided for the use of the public. Where wall and floor hatches are provided, it may be necessary to take special precautions to safeguard against their obstruction and facilitate their use, eg by the provision of guard rails round the hatchway.

ROOF EXITS

6.42 Normally, persons escaping from a fire, other than those escaping from a level below ground, should not have to ascend to a higher level to reach a place of safety. However, in exceptional circumstances where it is not practicable to provide means of escape without placing reliance on an upwards escape route, the following criteria should be met -

(a) roof exits should not normally be used by the public;

(b) the roof should be flat, adequately defined and guarded with protective barriers;

(c) the escape route across the roof and its supporting structure should be constructed as a fire resisting floor;

(d) if the escape route is in one direction only, any openings that are not fire resisting should not be sited within 3m of the route;

(e) persons should not have to ascend more than one level;

(f) the exit should be in, or should lead directly to, a place of safety;

(g) the higher level to which persons ascend should not be an area of high risk;

(h) the route by which the higher level is gained should be a stairway;

(i) if the stairway serves any lower level(s) also, the upward escape route should be separated from the remainder of the stairway by fire resisting construction and by fire doors.

7. DOORS

FIRE DOORS

7.1 Fire 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 emphasised. The failure of doors under fire conditions usually occurs either at the gap between the door and the frame, or at one or more of the points where ironmongery is fixed (particularly at the hinges or lock positions), or, in the case of glazed doors, at the line of the junction between the glazed area and the rest of the door. For this and other reasons it is particularly important to ensure that doors delivered on site comply precisely, in dimensions and workmanship, with the manufacturers specification for the appropriate fire resistance test report. Doors should also be hung to ensure a good fit when closed (no more than about the thickness of 50p piece) and the use of wedges should not be permitted (see paragraph 7.8).

7.2 Fire doors are provided for heat or smoke control, or to protect means of escape. A basic recommendation for a half hour door could be misleading as this only refers to the criteria for stability (British Standard 476). For the purposes of this chapter, fire doors are designated by reference to their required performance (in minutes) for integrity only (eg a reference FD 20 implies that the door in that situation should achieve not less than 20 minutes integrity when tested in accordance with British Standard 476 : Part 22 and a reference FD 30 implies not less than 30 minutes integrity). Where doors are also required to retard the passage of smoke at ambient temperature the suffix 'S' is added.

NOTE - `integrity' is the ability to withstand cracking or opening up to the extent of allowing flames to pass through.

UPGRADING DOORS

7.3 An FD 20 door can normally be upgraded to FD 30 by the provision of intumescent strips. The passage of smoke at ambient temperature can be resisted by the provision of flexible edge seals (possibly in conjunction with intumescent strips) or possibly by the provision of 25 mm a 35 mm doorstops.

Depending on the suitability of existing doors (they should not be too flimsy) and their location, it is possible to upgrade them to the required standard (Guernsey Fire Brigade appendix FP/4 should be consulted). It is however usually more practicable to purchase new doors due to the time and effort taken.

FIRE RATING

7.4 Fire doors should be provided to suit the correct fire rating as follows -

(b) FD 20S - (i) a fire door forming part of the enclosure of open plan areas which persons need to pass in case of fire;
(ii) a fire door forming part of the enclosure of a corridor forming a dead end not also being item (x);
(iii) a fire door sub-dividing corridors connecting alternative exits;
(iv) a fire door sub-dividing dead end portions of corridors from the remainder of such corridors;

(c) FD 30 - (v) a fire door forming part of the enclosure of all lift shafts except those within enclosures of a protected stairway;
(vi) a fire door forming part of the enclosure of builder's ducts etc;
(vii) a fire door affording access on to an external stairway (other than that at the highest level);
(viii) a fire door forming part of the enclosure of the following ancillary accommodation -

1. storage area not greater than 450 sq m (see notes 1 & 2)
2. repair and maintenance workshops and reprographic rooms (see note 1)
3. kitchens (separately or in conjunction with an associated restaurant/canteen);
4. transformer, switchgear and battery rooms, for low voltage or extra low voltage equipment;

(d) FD 30S - (ix) a fire door forming part of the enclosure of a protected stairway;
(x) a fire door forming part of the enclosure of a fire resisting lobby or corridor approach to a protected stairway;

(e) FD 60 - (xi) a fire door forming part of the enclosure of the following ancillary accommodation -

5. loading bays;
6. storage areas greater than 450 sq m (see notes 1 & 2);
7. service installation rooms other than those covered in items 4 and 9 to 13 inclusive;
8. car parks within or adjoining a building;
9. boiler rooms (see note 3);
10. fuel storage spaces (see notes 3 & 4);
11. transformer and switchgear rooms for equipment above low voltage;
12. rooms housing fixed internal combustion engines; and
13. any higher fire risk area other than items 9 to 13.

NOTE 1 - Not higher fire risk areas.
NOTE 2 - Other than refuse storage.
NOTE 3 - Other than oil fired boiler installations and oil storage.
NOTE 4 - Other than liquified petroleum gas storage.

GLAZED ELEMENTS

7.5 The above paragraphs exclude reference to any performance for insulation (because of problems of radiation through traditional fire resisting glass). Because a heat barrier would prevent persons passing doors or walls incorporating glazed elements, these should not extend any lower than 1.1 m above floor level when installed in such a situation.

SELF CLOSING DEVICES

7.6 The ability of fire doors to perform their designed function will depend upon their being fully closed at the time of the fire. They are, therefore normally required to be fitted with self closing devices. These devices should be capable of overcoming the latch if fitted, or otherwise of holding the door in the closed position.

7.7 Rising butt hinges are not suitable, as are possibly the cheaper devices which, when first installed cause a door to slam, and then lose their strength over a period of time and fail to close the door.

7.8 Self closing devices are not required on doors to cupboards, service ducts and any vertical shafts linking floors, but these should be kept locked shut when not in use.

AUTOMATIC DOOR RELEASES

7.9 No means should be provided for holding a self closing fire door in an open position other than by an automatic door release which will effectively cause the door to close when activated by a signal from the electrical fire alarm, which incorporates smoke detectors. The release must also be provided with a ready means of manual operation from a position at the door. Automatic door releases should only be fitted to a door which cannot be kept closed because of the problems presented by its frequent use in the day-to-day running of the premises. Normally no such device should be fitted to doors forming part of a stairway enclosure. The door release should be positioned at the same height as the door closer in order to prevent warping.

DIRECTION OF OPENING

7.10 Escaping persons arriving at a locked exit will quickly form a build-up if there is any delay in getting out. It may therefore be impossible for persons at the head of the build-up to open the door (because of weight of numbers) if it opens inwards. Normally therefore, a door used for means of escape should open in the direction of escape. It should always do so -

(a) if it is from a room in which a fire may develop very rapidly; or

(b) if the door is from a space from which more than 50 persons may require escape.

The door should also -

(c) be hung so that when open it does not obstruct any escape route;

(d) open through not less than 90 degrees;

(e) be provided with an observation panel if it is hung to swing both ways.

Because of the tripping hazard it should also -

(f) not open directly over a step; and

(g) not have too high a threshold (modern plastic doors appear to suffer from this).

FASTENINGS ON DOORS

7.11 As stated above, any delay in persons escaping is likely to create problems. Therefore wherever possible, doors used for means of escape should be kept unlocked at all times when people are in the building and in no case should a door be so fastened that it cannot easily and immediately be opened from the inside without the use of a key.

PANIC BOLTS OR LATCHES

7.12 Where the door -

(a) might be used at the time of a fire by more than 50 persons; or

(b) is an exit from a building (or part of a building) of high risk,

and has to be kept fastened while persons are in the building, it should be done only by means of a panic bolt or panic latch fastening which ensures that it can be readily opened by pressure applied by persons within.

More than one type of fastening should not be fitted to any door (eg a panic bolt fitted for ease of exit would be negated by the addition of, say, a barrel bolt).

NOTE - Where special security arrangements are necessary eg banks, consideration will need to be given to the fastening of doors. In such cases it will be necessary for all concerned to understand the method of fastening to be used and for all to be able to use it in the event of an emergency. Alarms can also be fitted to emergency doors, to either act locally or generally. The addition of a notice warning of the alarm should deter frivolous use.

OTHER FASTENINGS

7.13 Other door fastenings which may be satisfactory according to circumstance (but to a lesser extent) are -

(a) push pads, which act in a similar way to a panic latch but which has a smaller pressure area;

(b) special mortice locks which will always open from the inside without the use of a key, but which can be locked to persons outside, (the provision of lever type handles are preferred);

(c) emergency exit locks in doors with break glasses;

(d) emergency break glass draw bolts;

(e) yale type locks;

(f) draw type bolts.

NOTE 1 Where a special form of mechanical fastening is used, precise instructions as to its use should be displayed where they can be clearly seen and understood by any persons using the fastening. The use of electrically operated fastenings require special consideration to ensure that they are readily operable at all material times and will fail safe.

NOTE 2 Keys in glass fronted boxes are no longer considered acceptable for securing doors required for means of escape purposes.

OTHER POSSIBLE EXITS (WITH LIMITATIONS)

WICKET DOORS AND GATES

7.14 Often a wicket door is provided in a large door or in a shutter. These may be satisfactory for 2 or 3 persons for the purpose of means of escape in high risk buildings and parts of buildings. Elsewhere they may also be acceptable provided the numbers of persons likely to use them are not more than 10 - 15, and are not members of the public. Unless circumstances are exceptional a wicket door should provide a minimum opening the top of which is not less than about 1.5 m and the bottom of which is not more than about 250 mm above the floor. The width of the opening should preferably be not less than about 500 mm and in no case less than 450 mm.

GOODS DELIVERY DOORS, SHUTTERS etc

7.15 Normally, loading doors, goods doors, shutters (roll, folding or sliding), up-and-over doors and similarly filled openings may not afford satisfactory exits for means of escape in case of fire. However, there may be instances in buildings (or parts of buildings) of normal or low risk where it will be possible to regard them as such provided that they are not likely to be obstructed and can be opened manually even if normally power operated.

WINDOW EXITS

7.16 Only in exceptional circumstances should windows be used as a means of escape to a place of safety. Where they are provided, the following conditions should be met -

(a) no member of the public should need to use the exit;

(b) not more than 10 able-bodied people should need to use the exit;

(c) any such window should be sufficiently large and openable (to at least 850 mm in height x 500 mm wide in the clear with the casement open) to permit an average size person to pass through with ease;

(d) suitable steps should be provided up to the windowsill, both inside and outside the building with hand grips provided as necessary. The external ground surfaces should be level and unobstructed and the route of escape should lead to a point of dispersal well clear of the building;

(e) the height of the windowsill should be not more than 1.1 m above the floor level;

(f) simple fastenings which do not require the use of a key in an emergency should be fitted to the openable window;

(g) any such window should be conspicuously indicated as a FIRE EXIT (see paragraph 9.2).

REVOLVING DOORS

7.17 Because of the risk of jamming, conventional type revolving doors are not normally suitable on an escape route and must be supplemented by exit doors immediately adjacent which are clearly indicated as such. Exceptionally, however, where only a small number of people are likely to be involved, exit doors which are not adjacent may be accepted. The use of revolving doors which are specially constructed to automatically convert to side hung outward opening doors upon pressure from within should not be ruled out as they can prove suitable in certain cases.

SLIDING DOORS

7.18 Normally these are not suitable on escape routes unless they are used solely by staff or they are automatic in action and arranged to fail safe to outward opening from any position of opening; or they are provided with a monitored fail safe system for opening if the mains power supply fails.

8. FIRE RESISTANCE AND SURFACES OF WALLS AND CEILINGS

8.1 Fire resistance refers to the ability of construction to prevent heat and smoke from travelling from one area (compartment) into another and is built in to protect means of escape and prevent fire spread.

The requirement for a low surface spread of heat or flame over walls and ceilings is designed to prevent fire already present in the means of escape (whether in a room, corridor or stairway) from preventing persons escaping.

MINIMUM FIRE RESISTANCE

8.2 When planning fire precautions and means of escape in premises it is usual to have regard to the fire resistance of the elements of structure, eg walls, floors etc. In the types of premises covered by this guide it may not always be possible to achieve the minimum standards set out in the table below. In such circumstances compensating features are required such as a reduction in the distance of travel and/or the provision of automatic fire detection and/or automatic fire suppression systems.

MINIMUM FIRE RESISTANCE (IN MINUTES) (Figures in brackets refer to the notes below)

FLOORS	OFFICES AND SHOPS	FACTORIES
Floor immediately over a basement	- 30 (1,2 and 10)	: 60 (1,2 and 10)
All other floors	- 30 (1 and 2)	: 30 (1 and 2)
Enclosing a compartment	- 30	: 60 (10)
Enclosing an area of high fire risk	- 60 (10 and 11)	: 60 (10 and 11)
WALLS AND DOORS		
Enclosing a stairway, protected route or lift motor room	- 30 (3,5,7 AND 9)	: 30 (3,5,7 AND 9)
Enclosing a lift well	- 30 (4,5 AND 7)	: 30 (4,5 AND 7)
Enclosing a compartment	- 30 (5,7 AND 9)	: 60 (5,7 AND 9)
In a stairway from ground floor to basement	walls - 30 doors - 2 x 30 (5,7 and 9)	: 60 (10) 2 x 30 or 1 x 60 (5,6,7 and 9)
Enclosing an area of high fire risk	- 60 (7,8 and 9)	: 60 (7,8 and 9)
Ventilation duct	- 30 (1)	: 30 (1)
In a corridor to sub-divide it	- 20 (5,7 and 9)	: 20 (5,7 and 9)

NOTES

(1) See paragraph 8.6.

(2) This does not include for example, a gallery floor.

(3) Except a door to a toilet containing no fire risk, provided that the toilet room is separated by fire resisting construction from the remainder of the building.

(4) Except a lift well contained within a protected stairway enclosure (see also paragraphs 6.35 and 7.4).

(5) An existing timber door may deem-to-satisfy the necessary standard of fire resistance if it can be suitably modified in accordance with the methods recommended in the Guernsey Fire Brigade appendix FP/4.

(6) See paragraph 6.22.

(7) See paragraphs 5.6 and 7.9 (f).

(8) See paragraph 2.4.

(9) (a) Fire resisting glass may be incorporated into the wall separating any accommodation from a corridor that is a protected route provided that the glass in its framework satisfies the fire resistance criteria for British Standard 476 : Part 22.

(b) A glazed screen with timber frames may be used to separate an escape corridor provided that the appropriate fire resistance given in the table is maintained between the two areas. The insulation criterion of the British Standard may be waived where the glazing is limited to an area at least 1.1 m above the adjoining floor level (see also paragraph 7.5).

(c) Vision panels incorporated into a door which protects an escape route must not reduce the fire resistance required for the door and should accord with the appropriate provisions of British Standard 6262.

(10) See paragraph 8.3.

(11) Other than the ground floor.

8.3 The period of fire resistance suggested in 8.2 above should wherever practicable be achieved except that in a building where the main elements of structure offer less than a 60 minute standard, an enclosure to an area of high risk and the floor immediately over a basement should, under no circumstances, be less than 30 minutes fire resistance. In any other case in which the suggested periods of fire resistance cannot be achieved it will be necessary to consider whether some compensating provision is needed, such as a reduction in the distance of travel and the provision of automatic fire detection.

8.4 Accommodation coming within the scope of this guide and situated within a building comprising other categories of use, ie residential, should be structurally separated from such premises by imperforate construction which affords a fire resistance of not less than 60 minutes. Provision should also be made for independent and protected escape routes.

8.5 Where a flat roof forms the floor of an escape route or part of a route, the roof (or part of it sufficient to afford protection to persons using the escape route) should be constructed to an appropriate standard of fire resistance given for floors in paragraph 8.2.

FIRE/SMOKE SPREAD

8.6 In addition to the measures already recommended for protected routes, areas of higher fire risk, lift wells etc (see paragraph 8.2) it will be necessary to safeguard the means of escape against the spread of fire and smoke and hot gases through service openings in the building structure, eg service ductwork, pipework openings, chutes and ventilation trunking. This list is not exhaustive but is intended to highlight those engineering services commonly found and which need to be considered. Safeguards normally consist of protective fire resisting enclosures to these services where they may pass through, or into, escape routes from other parts of the premises (see paragraph 8.2) or by effective fire/smoke stopping at the point where the building services penetrate the floors or walls. In the larger premises where extensive ventilation ductwork is present fire dampers may be required.

8.7 However, in industrial buildings it is often impractical to provide fire resisting separation between floor levels and unprotected openings for items of plant, ducting, trunking and similar features associated with the processes being carried on have to be accepted. Where this is the case it will always be necessary to assess the means of escape needs having proper regard to the greater possibility of fire and smoke spread in such circumstances.

8.8 The absence of structural separation is not always apparent, and the existence of voids and wall cavities in which smoke and heat may travel is sometimes evident only from a detailed examination of the construction. In some circumstances a fire in a room, if allowed to develop, may effect adjoining rooms or spaces by means of penetration other than through the door opening, eg by wall cavities and ceiling or roof voids.

8.9 Often the installation of -

(a) ventilation systems;

(b) recessed ceiling lights;

(c) the renewal of or changes to central heating systems; or

(d) rewiring;

may have weakened the integrity of the fire resistance, allowing smoke penetration.

8.10 To prevent heat and smoke passing initially from an area or room via gaps or crevices thus jeopardising the use of escape routes, these should be filled or 'stopped' to a standard equal to that of the element of construction.

8.11 In order to provide you with some guidance in the type of structure which would give a fire resistance of 30 minutes, some examples of suitable materials are given as follows -

(a) WALLS

(i) 75 mm reinforced concrete
(ii) 100 mm brick
(iii) 100 mm concrete block
(iv) 12.5 mm plasterboard both sides of timber frame
(v) 9.5 mm plasterboard both sides of timber frame plus 5 mm of gypsum plaster
(vi) 50 mm rockwool

(b) FLOORS

21 mm thickness of tongued and grooved boarding on timber joists not less than 175 mm deep by 50 mm wide with ceiling of one layer of plasterboard of minimum thickness of 12.5 mm finished with 5 mm layer of gypsum plaster.

SURFACES OF WALLS AND CEILINGS

8.12 Apart from small areas the surface of walls and ceilings should correspond to a standard not lower than the appropriate classification indicated below -

Class 0	In escape routes (see paragraph 8.14)
Class 1	In rooms, other than small rooms (see paragraph 8.15)
Class 3	In small rooms (see paragraph 8.16)

NOTES -

(i) Class 0 means the standard prescribed be A.8 of Approved Document B 2/3/4 of the Building Regulations.

(ii) Classes 1 and 3 means in accordance with British Standard 476 : Part 7.

(iii) The proper application of special coatings on existing surfaces to achieve a certified Class 1 rating may be suitable, subject to being maintained.

8.13 In the early stages of a fire in a building, the personal hazards to occupants can be severely affected by the internal linings, and finishes of walls and ceilings. Materials likely to be found in situ in existing buildings are often difficult to assess in terms of surface spread of flame and fire propagation. Some examples of these materials have therefore been broadly classified as follows.

CLASS 0

8.14 Acceptable in all locations -

(a) inorganic materials, ie brickwork, blockwork, concrete, plasterboard, ceramic tiles, plaster finishes (including rendering on wood or metal laths) and all other surfaces conforming to Class 0;

(b) woodwool slab;

(c) thin vinyl and paper coverings (other than heavy flock wallpapers), provided they are fixed to an inorganic surface described in (a) above.

CLASS 1

8.15 Flame retardent grade or treated to achieve Class 1 surface spread of flame rating and acceptable in all rooms provided evidence of suitable treatment is available -

(a) cellulosic materials, ie timber, particleboard (chipboard), hardboard, blockboard;

(b) thermosetting plastics (decorative laminates);

(c) heavy flock wallpapers.

These are not acceptable on escape routes ie stairways, corridors, entrance halls.

CLASS 3

8.16 (a) Materials mentioned in 8.15 but not flame retardent treated are acceptable as follows -

(i) in small rooms of floor area not exceeding 30 sq m.

(ii) in small areas of other rooms, these areas not exceeding half the floor area of the room or 60 sq m whichever is the lesser.

(b) plastics - thermoplastics, ie expanded polystyrene (provided it is not finished with gloss paint, and is on inorganic surfaces in thicknesses not exceeding 5 mm on walls or 12 mm on ceilings). (Any such surface which has been painted with gloss paint should be removed.)

These are not acceptable on escape routes ie stairways, corridors, entrance halls.

ADVICE ON FLOOR COVERINGS

8.17 Some floor coverings will, when involved in fire, react to produce large volumes of heat and toxic smoke although the surface spread of flame may be relatively slow. The possibility that the floor coverings may present a hazard to means of escape should not be overlooked and should feature in the overall assessment of suitability of surfaces, walls and ceilings to protected routes. If new floor coverings are to be installed to overcome this problem, they should comply with British Standard 5287 as conforming to the low radius of fire spread (up to 35 mm) when tested in accordance with British Standard 4790.

ADVICE ON FURNITURE AND FURNISHINGS

8.18 Furniture and furnishings which are easily ignited or demonstrate rapid spread of flame characteristics present a particular fire hazard and their presence will be a factor in determining the acceptability of escape routes and in particular of protected routes.

When replacing upholstered furniture always choose items incorporating combustion modified foam with coverings that are resistant to ignition. In the meantime, easily ignited foam filled furniture can be improved by fitting fire retardent coverings.

In the case of curtains or drapes in excess of 10 sq m in continuous runs, the advice of a fire prevention officer should be sought.

9. NOTICES AND SIGNS

EXIT AND DIRECTIONAL SIGNS

9.1 All fire safety signs, notices and graphic symbols should conform as far as possible with British Standard 5499 : Part 1 and with British Standard 2560 for internally illuminated exit signs. However, existing signs and notices need not be replaced immediately if they are fulfilling their purpose effectively. They should, however, be examined and replaced if they are found to be inadequate.

9.2 Any exit which is not a normal route of travel from a building should be indicated by a notice bearing the words "FIRE EXIT" in conspicuous lettering of appropriate size. The notice should be displayed immediately above the exit opening, wherever possible. Where this is not possible a position should be chosen where the notice is least likely to be obstructed and most likely to be seen.

9.3 At suitable points along an escape route where an exit cannot be seen or where a person escaping might be in doubt as to the location of an exit, a notice should be provided bearing, in lettering of appropriate size, the words "FIRE EXIT" and the necessary directional arrow. Such notices should be fixed in conspicuous positions, wherever possible between 2 m and 2.5 m above the floor level.

NOTICES ON DOORS

9.4 A door fitted with a panic bolt or panic latch should have the words "Push Bar to Open" printed on the door immediately above the pushbar.

9.5 A notice with the words "Fire Door - Keep Shut" should be permanently displayed at about eye level on both faces of all fire doors except those to cupboards. Fire doors which are normally open but which close automatically on the operation of fire detectors should bear the words "Automatic Fire Door - Keep Clear".

9.6 A notice with the words "Fire Door - Keep Locked" should be permanently displayed on the outside face of all fire doors not required to be self closing eg cupboards.

9.7 A notice with the words "Slide to Open" in conspicuous lettering of appropriate size with an arrow pointing in the appropriate direction should be permanently displayed at about eye level on the face(s) of all sliding doors which afford an exit or are situated across an escape route.

9.8 A notice with the words "Fire Escape - Keep Clear" should be permanently displayed at about eye level on the external face of all doors which are provided solely as a means of escape in case of fire and which, because they are not normally used, are liable to be obstructed.

SIZE OF LETTERS

9.9 The size of lettering on "FIRE EXIT", "EXIT" or "EMERGENCY EXIT" signs should be as follows -

Up to 10 m away	- 50 mm
Over 10 m and up to 20 m	- 75 mm
Over 20 m and up to 30 m	- 100 mm
Over 30 m and up to 40 m	- 125 mm
"Push Bar to Open"	- 50 mm
"Slide to open"	- 20 to 40 mm

10. MEANS FOR GIVING WARNING IN CASE OF FIRE

GENERAL

10.1 In any building or part of a building requiring registration there should be a means for giving a warning in case of fire to persons in the building.

FIRE ALARM STANDARDS

10.2 A fire alarm system should comply at least with the recommendations for type M of British Standard 5839 : Part 1 and where an alarm system is installed to comply with the British Standard a completion certificate should be provided.There may, however, be situations where a simpler means of raising the alarm could be regarded as adequate (see paragraph 10.3). (For automatic detection see paragraph 10.8.)

GUIDANCE ON CHOICE OF CLASSIFICATION

10.3 The following paragraph is for guidance only as each premise has its own differing factors, however, some idea of the type of fire alarm required should become clearer.

(1) In very small premises - of up to say 100 sq m, it may be reasonable to have no actual alarm and to rely on shouting etc. In this case it would be helpful if the premise had -

(a) an absence of internal walls (so that the call of FIRE could be heard throughout);
(b) short travel distances (so that easy egress can be made);
(c) only one storey.

(2) In small premises - say up to 150 sq m, it may be reasonable to have a simple mechanical alarm such as a handbell etc. In this case it would be helpful if the premise had -

(d) see (1) (a and b) above;
(e) not more than two storeys;
(f) an absence of noisy processes (so that the alarm could be heard above any background noise);
(g) an absence of high risk areas;
(h) easy all round access (so that possibly the alarm can be safely and easily raised from another position).

(3) In the majority of the remaining premises the system should be at least a manually operated (break glass) electrical system.

(4) Automatic detection would possibly be recommended if all or some of the following apply -

(i) travel distances are excessive;
(j) the building is more than two storeys high;
(k) there is more than one occupancy (using the same escape routes);
(l) there are high risk areas (depending on their nature and position):
(m) there are sleeping risks (flats etc);

NOTE - automatic fire detection is necessary in some situations, to which the following paragraphs refer - 2.9 (viii); 4.9 (ii); 6.11; 7.9; 8.2 and 8.3.

SMALL BUILDINGS

10.4 In addition to electrical alarms which will, of course, be suitable, it is sometimes found acceptable in smaller buildings, and subject to the approval of the Fire Brigade, for manually operated sounders to be used if each sounder can be sited in a place of safety and will give a warning which is audible throughout the building.

TWO-STAGE FIRE ALARMS

10.5 In office premises whether in single or multiple occupation, consideration may be given to provide for two different kinds of alarm signal, an `alert' signal (usually intermittent) which need not be treated as a signal for general evacuation, and an 'evacuation' signal (usually continuous), which may be given in the zone of origin of the alarm while other parts are receiving the `alert'. The approval of the Fire Brigade should be sought before such a system is installed.

STAFF ALARMS

10.6 In large shops and catering establishments an initial general alarm may be undesirable because of the number of general public present and the need for fully trained staff to effect pre-planned procedures for safe evacuation. Restricted alarms by means of sounders or other types of communication (including personal paging systems) supplemented by visual systems for staff recognition may be preferred. Provision should be made for sounding a general alarm for evacuation by sounders or the signal broadcast over the public address system. The evacuation alarm should be under the control of a responsible person specifically nominated to be responsible for deciding when the second stage should be put into effect.

AUDIBLE ALARMS BY PUBLIC ADDRESS SYSTEMS ETC

10.7 Where these systems are used to transmit a general alarm the signal should take priority and override other facilities of the equipment. The alarm signal, that may be followed by voice transmission of essential information for safe evacuation, should be distinct from other signals that may be in general use on the system. Section 9.12 of British Standard 5839 : Part 1 gives advice on the general requirements in this respect.

SEPARATE BUILDINGS

10.8 In establishments which consist of several separate buildings, the same system should be installed in all parts, but the system in each separate building may be self-contained, so that an alarm may be sounded in one part without automatically operating throughout the rest of the establishment.

TYPES OF ELECTRICAL SYSTEMS

10.9 This is the classification of the type and extent of protection given to a particular premise. The two major categories are those of life and property protection, these are sub-divided into categories of total and partial protection. It is important that the type of system required for a particular premise is decided upon before design of the system commences.

Each category has a type letter for easy reference as follows.

10.10 TYPE L systems are automatic detection systems intended for the protection of life.

They are further divided into -

(i) TYPE L3 which is installed only for the protection of corridors and escape routes. (This may also require detectors in rooms opening onto escape routes.)

(ii) TYPE L2 which is installed only in defined parts of the protected building where a fire could lead to a high life hazard eg sleeping areas without supervision or high risk areas. An L2 system should always include the coverage of an L3 system.

(iii) TYPE L1 which is installed throughout the protected building with the exception of -

(a) lavatories and water closets;

(b) voids less than 800 mm in height, unless the spread of fire between rooms or compartments can take place through it;

(c) roof spaces without services or storage space; and

(d) cupboards under 2 sq m with no special hazard such as switchgear or if positioned understairs.

10.11 **TYPE P** systems are automatic detection systems intended for the protection of property and may be required by an insurance company.

They are sub-divided into -

(i) TYPE P2 which roughly equates to L2; or

(ii) TYPE P1 which roughly equates to L1.

10.12 **TYPE M** systems are manual alarm systems and have no further sub-division.

10.13 Systems intended for use in multi-occupancy buildings are given the suffix letter X. Systems both of types L and P should also be provided with manual call points.

ZONING OF THE SYSTEM

10.14 To ensure a fast and unambiguous identification of the fire source the protected area should be divided into zones. When determining the area to be covered by a zone, consideration should be given to accessibility, size, the fire routine determined for the premises, and particularly in occupied premises, that each zone is accessible from the main circulation routes leading from where the control panel is sited. The control panel, or a repeater should be positioned where it can be seen by the Fire Brigade upon their arrival.

In general the following guidelines for the size of a zone should be observed -

(a) if the total floor area of the building is not greater than 300 sq m then the building need only be one zone, no matter how many floors it has;

(b) the total floor area of a zone should not exceed 2000 sq m;

(c) the search distance should not exceed 30 m. This means the distance that has to be travelled by a searcher inside a zone to determine visually the position of a fire should not exceed 30 m. The use of remote indicator lamps outside doors may reduce the number of zones required.

(d) where stairwells or similar structures extend beyond one floor but are in one fire compartment, the stairwell should be a separate zone;

(e) if the zone covers more than one fire compartment, then the zone boundaries should follow compartment boundaries;

(f) if the building is split into several occupancies, no zone should be split between two occupancies.

AUTOMATIC FIRE DETECTORS

TYPES OF DETECTORS

10.15 (a) IONISATION SMOKE detector - responds when smoke, having entered the detector causes a change in the ionisation currents within the detector. They are more sensitive to smoke produced by rapidly burning flaming fires.

(b) OPTICAL SMOKE detectors - have a photo-electric cell which responds when light is absorbed or scattered by smoke particles. They are more sensitive to smoke produced by smouldering fires.

(c) RATE OF RISE HEAT detectors - respond to a rapid rise in temperature, with a pre-set fixed maximum temperature, should the rise be slow.

(d) FIXED TEMPERATURE HEAT detectors - respond only to a pre-set fixed temperature, usually 60 degrees C or 90 degrees C.

CHOICE OF DETECTORS

10.16 When choosing the type of detector to be used in a particular area it is important to remember that the detector has to discriminate between fire and the normal environment existing within the building.

INCORRECT CHOICE

10.17 The incorrect use of a type of detector may cause unwanted alarms. Therefore smoke detectors should never be used where there is the likelihood of smoke or fumes being present in the normal working environment eg kitchens, boiler rooms, car parks, loading bays etc.

SMOKE DETECTORS

10.18 Whilst there are differences in the type of fire that the ionisation and optical smoke detectors are most suitable for, they are equally suitable for general detection taking into account the following provisos -

(a) ionisation detectors are more liable to false alarms from air currents, dust and gaseous substances.

(b) optical detectors are more liable to false alarms from tobacco smoke but are more suitable for sleeping risks in bedrooms, dormitories etc, and fires involving pvc or polyurethane foam products.

PROPERTY PROTECTION

10.19 When considering the type of detector to be used for property protection (P), the likely cost both in terms of the value of the property to be protected and the effect of disruption of the business that could occur from a serious fire, should be considered.

If these costs are relatively small then the installation of heat detectors may be considered. However, as heat detectors are far less sensitive than smoke detectors, if the costs are high then smoke detectors may be considered. Most systems are in fact a combination of smoke and heat detectors with heat detectors installed in lower risk areas.

LIFE PROTECTION

10.20 When dealing with systems installed for life safety (L) then in general it is advisable to install smoke detectors to give the earliest possible warning of a fire, especially with regard to escape routes and corridors. In order to reduce the possibility of false alarms, rate of rise detectors should be fitted in offices, work rooms etc.

FALSE ALARMS

10.21 It is essential that the utmost care should be taken by both installer and user to reduce the incident of false alarms. Common causes include as follows.

GENERAL

10.22 (a) Mechanical and electrical faults which may result from vibration, impact or inadequate servicing;

(b) Ambient conditions such as high air velocities, heat, smoke or flame from a process within a building;

(c) Contractor's employees working in a protected area unaware of the presence of a fire detection system;

(d) Communication faults arising from servicing and testing work carried out without prior notification to the Fire Brigade or arising from Guernsey Telecoms activity.

HEAT DETECTORS

10.23 False alarms may be causes by abnormal increases in temperature caused by space heating equipment, industrial processes and sunshine. They may be obviated by installing detectors with, where appropriate higher temperature settings, or in the case of direct sunshine, by introducing an appropriate shade.

SMOKE DETECTORS

10.24 False alarms may be caused by smoke and other fumes, dusts (including slow accumulations of dust and disturbed aerial dusts), fibres, steam and condensation produced by normal processes, activities and the environment, by vehicle engines and insect infestation. Self cleaning ovens may cause an ionisation detector to operate.

Very fast air flows eg in a warehouse exposed to windy conditions, may cause ionisation smoke detectors to give false alarms. Under such situations, special precautions may need to be taken by the system designer.

MANUAL CALL POINTS (BREAK GLASS)

10.25 The break glass call point is a device to enable persons to raise the alarm in the event of a fire, by simply breaking a frangible element and thus activating the alarm system. The following notes give guidance for the correct siting and positioning of break glass call points -

(a) break glass call points should be located on exit routes and in particular on the floor landings of staircases and at all exits to the open air;

(b) break glass call points should be located so that no person need travel more than 30 m from any position within the premises in order to give an alarm;

(c) generally, call points should be fixed at a height of 1.4 m above the floor, at easily accessible, well illuminated and conspicuous positions free from obstruction;

(d) the method of operation of all call points in an installation should be identical unless there is a special reason for differentiation.

ALARM SOUNDERS

10.26 An important component of any fire alarm system is the alarm sounder, normally a bell or electronic sounder, which must be audible throughout the building in order to alert and/or evacuate the occupants of the building.

The following notes give guidance for the correct use of alarm sounders -

(a) a minimum sound level of either 65 dBA or 5 dBA above any background noise likely to persist for a longer period than 30 minutes in any one day, whichever is the greater, should be produced by the sounders at any occupiable point in the building;

(b) all audible warning devices used in the same system should have a similar sound and be distinct from any other audible alarms used for a other purposes;

(c) a large number of quieter sounders rather than a few very loud sounders may be preferable to prevent noise levels in some areas from becoming too loud;

(d) it is unlikely that sounder noise levels in a room will be satisfactory if more than one dividing wall or door separates it from the nearest sounder. At least one sounder per fire compartment will be necessary;

(e) the level of sound provided should not be so high as to cause permanent damage to hearing;

(f) the number of fire alarm sounders used inside a building should be sufficient to produce the sound level recommended, but should in any case be at least two;

(g) in premises where the noise level may be excessive, or in any other situation where a normal type of sounder may be ineffective, visual signals should be used to supplement the audible alarms; they should not however be used on their own.

The sounders should be arranged on at least two separate circuits, so that failure of one circuit does not cause all sounders in the building to fail.

POWER SUPPLY

10.27 The power supply equipment for a fire alarm system should be exclusive to the fire alarm system. Where the fire alarm system is combined with other control or emergency systems, eg in computer controlled buildings, the reliability of the power supply should not be reduced by such non-exclusive use. In addition -

(a) connection to the mains supply should be via a switch-fuse reserved solely for the purpose, its cover being painted red and labelled 'FIRE ALARM - DO NOT SWITCH OFF';

(b) if the mains supply fails the standby supply must have a certain minimum duration after which sufficient capacity should remain to provide operation of the total alarm load for 30 minutes;

(c) for type L and M systems, if a mains failure will be recognised within 12 hours, then a standby duration of 24 hours is required. If the premises are likely to be unoccupied and not supervised to meet this 12 hour requirement, then the duration is required to be 24 hours after the detection of the fault;

(d) for type P systems, if the fault will be immediately recognised when it occurs (either in the building or over a remote link) then a standby duration of 24 hours is required. If the building has no remote link, and may be unattended at times, then the required duration is 24 hours longer than the building may remain unoccupied.

INSTALLATION ADVICE

10.28 In order to prevent incorrect provision of equipment, the following sequence should be followed -

(a) decide which classification is required (see paragraph 10.4);

(b) get quotes for the installation (at least three is advised);

(c) installers to provide details of equipment (preferably on plan, single line being sufficient);

(d) Fire Brigade to check details;

(e) decide which quote to accept;

(f) Fire Brigade to make site visit before installation to double check plan;

(g) installation;

(h) States Electricity Board to check installation and send in form to Fire Brigade;

(i) installer to send in form to Fire Brigade;

(j) Fire Brigade to test the installation.

ROUTINE TESTING

10.29 The system should be regularly tested and serviced in accordance with the requirements of British Standard 5839, as a guide the user should carry out the following tests and inspections at regular intervals -

(a) DAILY

(i) check that the panel indicates normal operation. If not, record any fault indicated in the event log and report the fault to a responsible person;

(ii) check that any fault recorded for the previous day has received attention.

10.29 (b) WEEKLY

(iii) operate a manual call point or smoke detector to ensure the system operates properly. Each week a different detector should be checked;

(iv) check that the sounders have operated and then reset the system;

(v) check the battery connections;

(vi) complete the event log with details of date, time, trigger device tested and enter `Routine Weekly Test' in the event section. Any defects should be entered under 'Action Required' and reported to a responsible person.

(c) QUARTERLY

(vii) check entries in the log book and take any necessary action;

(viii) examine the batteries and their connections;

(ix) operate a manual call point or detector to ensure the system operates properly, checking that all sounders are operating;

(x) check that all functions of the alarm control panel operate by simulating fault conditions;

(xi) visually check that structural alterations have not been made that could have an effect on the siting of detectors and other trigger devices;

(xii) complete the event log with details of date, time trigger device tested and `Quarterly Test' in the event section. Any defects or alterations to equipment should also be entered.

(d) ANNUALLY

(xiii) carry out an inspection as detailed for the quarterly inspection;

(xiv) every detector should be tested in situ;

(xv) all cable fittings and equipment should be checked that they are secure and undamaged.

The above maintenance programmes are for use as a guide only and the frequency of testing should be adapted to suit the environment that the equipment is working in.

NOTE - Fire Alarm connections to the Fire Station should only be tested by arrangement with the Brigade control room operator.

11. EMERGENCY ESCAPE LIGHTING

LIGHTING - GENERAL

11.1 In common escape routes including stairways, normal lighting with a suitable system of control should be provided so that people are able to move within and escape from areas which do not have the benefit of daylight and also escape from the building during the hours of darkness.

ESCAPE LIGHTING

11.2 Escape lighting should be provided in buildings where there is underground or windowless accommodation, core stairways or extensive internal corridors and in buildings where travel along escape routes would be made difficult in darkness. Generally the need for escape lighting will arise more frequently in shops than in factories and offices because of the greater likelihood of people in the building being unfamiliar with the means of escape. An escape lighting system should conform with the appropriate provisions including the certification provisions contained in British Standard 5266 : Part 1.

ARTIFICIAL LIGHTING

11.3 Adequate artificial lighting should be provided throughout the premises to ensure that persons may move directly to a place of safety.

MODE OF OPERATION

11.4 The mode of operation for emergency lighting luminaires and systems is normally categorised by the suffix M for maintained (operates from normal supply and emergency supply and can be switched), NM for non-maintained (emergency use only) and S for sustained (illuminated at all material times), followed by a '/' and the number of hours duration in the event of a mains failure, eg

M/1 is a maintained 1 hour duration system;
NM/3 is a non-maintained 3 hour duration system.

11.5 The type and category of the escape lighting to be used in any particular premises is dependent to some extent upon their size and function. For most types of premises either a maintained or non-maintained system will normally prove to be equally satisfactory. However, a maintained system should invariably be employed in premises where the normal lighting can be dimmed or reduced below the levels required for escape route identification and illumination whilst the premises are occupied, eg most places of public entertainment.

11.6 The cost difference between a 1 hour system and a 3 hour system, particularly for self contained luminaires, means that in most cases the designer would be well advised to design any system for a 3 hour duration.

POSITIONING OF LUMINAIRES

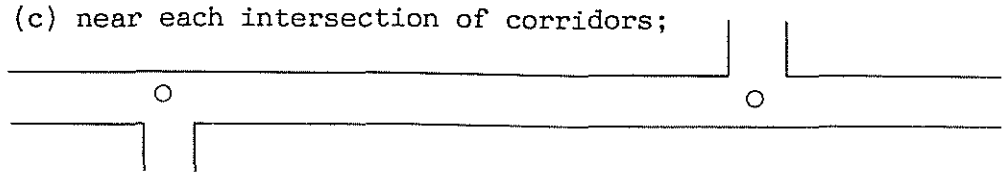
11.7 The correct positioning of emergency luminaires is essential in order to provide a system that not only complies with the various legislative requirements but provides a safe and effective way of evacuating a building in the event of a mains failure. Therefore apart from achieving the minimum light levels, various obstructions, hazards and routes must be covered. The following is a step by step guide to assist in the design of the system.

11.8 Luminaires and signs should be positioned -

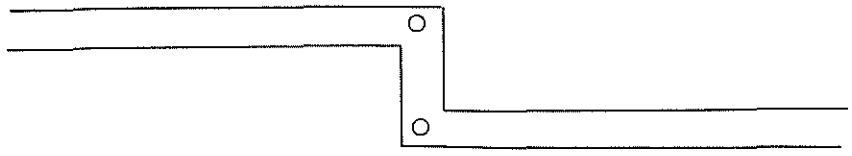
(a) to show exit routes and final exits from premises clearly. Signs should be illuminated;

(b) to ensure exterior areas of final exits are lit to at least the same level as the area immediately inside the exit to enable people to move away from the exit to areas of safety;

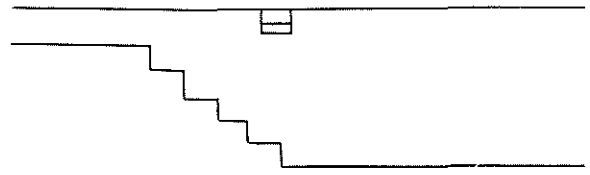
(c) near each intersection of corridors;



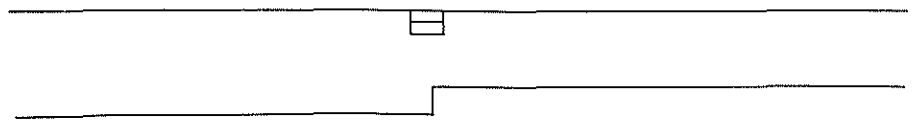
(d) near each change of direction;



(e) near each staircase so that each flight of stairs receives direct light;



(f) near any other change of floor level which may constitute a hazard;



(g) to illuminate fire alarm call points and fire fighting equipment at all material times;

(h) to ensure normal pedestrian escape routes from covered car parks are illuminated to the same standard as escape routes within buildings;

(i) in plant, switch and control rooms;

(j) within passenger lift cars. Only self contained emergency luminaires are suitable for this application;

(k) in toilets exceeding 8 sq m.

If considered appropriate, each luminaire can be positioned in order to illuminate more than one of the above if they are adjacent. Moreover, it is considered good practice to position the various items for fire safety (extinguishers, call points etc) together so that their position is readily known.

ILLUMINANCE LEVELS FOR DEFINED AND UNDEFINED ESCAPE ROUTES

11.9 British Standard 5266 : Part 1 1988 gives a detailed definition of the required illuminance of escape routes. Escape routes have been divided into two types - `defined' which can be thought of as a specific corridor or corridor area; and `undefined' which can be thought of as an open plan area on the escape route which has an open plan office or supermarket, where no defined escape route is convenient.

DEFINED ESCAPE ROUTES

11.10 In most instances the horizontal illuminance at floor level on the centre line of a defined escape route should not be less than 0.2 lux. In addition for escape routes up to 2 m wide, 50% of the route width should be lit to a minimum of 0.1 lux. Escape routes wider than 2 m can be treated as a number of 2 m wide bands.

11.11 The 0.2 lux is a minimum level and within certain premises there may be areas where an illuminance level well in excess of that figure may be required eg where aged or partly sighted people are likely to be present.

11.12 To avoid abrupt changes between excessive dark and light areas on the floor of the escape route, it is necessary to illuminate the route reasonably uniformly.

UNDEFINED ESCAPE ROUTES

11.13 Undefined escape routes must be lit to an average of 1 lux. This may sound like a higher lighting level, but in practice, it is very similar to the 0.2 lux minimum needed in `defined' escape routes. An advantage of using this concept is that the layout of the particular area may be altered, ie by moving furniture, low level partitions, shelving units etc without the need to alter the emergency lighting system.

11.14 The use of a fewer number of high output emergency luminaires is normally the most cost effective way of illuminating an undefined escape route. The convertalite type is ideally suited for this application.

ROUGH GUIDE TO WATTAGE REQUIRED

11.15 The system requires detailed planning as to the type and numbers of luminaires required but a rough guide to the total wattage required can be got by dividing the floor area in square metres by 2.

NUMBERS REQUIRED

11.16 This should be decided by the installer, but as a rough guide, one unit is required for each 6 metres. This distance can be increased by installing better units, but on the other hand, care has to be taken to avoid installing lesser powered units such as those designed for toilets or lifts etc.

SERVICING

11.17 All emergency escape lighting requires regular testing and servicing and a record showing the date of each routine examination and test, and its result should be kept on the premises.

(a) CENTRAL BATTERY SYSTEMS. Simulation of a failure of the normal lighting supply for a continuous period of at least 1 hour should be carried out twice a year. During this period all luminaires and/or signs should be checked for proper function. For systems with specified duration categories in excess of 1 hour, it is recommended that a test for the full duration should be carried out every 3 years.

(b) SELF CONTAINED LUMINAIRES/SIGNS. Simulation of a failure of the normal lighting supply for a short period of time should be carried out once a month, and for 1 hour twice a year. Luminaires and signs with a specified time in excess of 1 hour should be tested for the full duration time once in every 3 years.

12. FIRE FIGHTING EQUIPMENT

12.1 All premises should be provided with means for fighting fire for use by persons in the building.

12.2 Fires involving ordinary combustible materials such as wood, cloth and paper are the most likely type of fire to occur in the majority of premises. Water is the most effective agent for extinguishing these fires and the appropriate equipment will therefore be hydraulic hose reels, water type extinguishers or extinguishers containing fluoroprotein foam (FP), aqueous film forming foam (AFFF), film forming fluoroprotein foam (FFFP) or light water.

HOSE REELS

12.3 If hose reels are installed they should be located where they are conspicuous and always accessible, eg in corridors. The hose should comply with Type 1 hose specified in British Standard 3169 and hose reel installations should conform with British Standard 5306 : Part 1 and British Standard 5274. For further details ask for Guernsey Fire Brigade appendix FP 52.

CHOICE OF EXTINGUISHER

12.4 There are several factors to consider in selecting the right kind of portable extinguishers for your premise but the most important is the kind of fire for which they are likely to be required. Guidance on this major point is given below. Other considerations which the buyer of extinguishers should bear in mind and on which this code provides guidance follow.

METHOD OF OPERATION

12.5 All extinguishers in the same premises (or in a group of companies) should, where possible, operate by the same method. For example, where water and foam extinguishers are provided it will avoid confusion if all the extinguishers operate in the `upright' position. (Note - all extinguishers conforming to British Standard 5306 : Part 3 operate in an upright position.)

OPERATING ANGLE OF JET

12.6 Extinguishers may be required to fight a fire where the jet has to be directed below the level of the extinguisher (eg under floorboards) or upwards (eg into fume hoods) and to meet such requirements extinguishers fitted with a hose are needed.

EFFECTIVE RANGE

12.7 Where the approach to a fire may be restricted the range of extinguishers is important (see paragraph 12.19).

SHAPE OF JET

12.8 A spray is more suitable than a jet where a fairly large area has to be covered and where the penetration of a solid jet is not needed. Purely surface fires in ordinary solid combustible materials are more effectively dealt with by a spray. A few water extinguishers are fitted with dual purpose nozzles designed to emit either a spray or jet.

EASE OF HANDLING

12.9 Nine litre water extinguishers, the most common sized extinguisher in general use, weigh between 15 to 18 kg and most people are capable of using such extinguishers without too much difficulty.

However, these extinguishers may be too heavy or cumbersome for some people, eg the elderly. In such instances 4.5 litre extinguishers should be installed.

ENVIRONMENT

12.10 High or low temperatures (above 43 degrees C and below 4 degrees C) may have a detrimental effect on some extinguishers. Care must be taken to choose extinguishers which will not prove dangerous or damaging in certain situations eg having a foam extinguisher near a heat treatment bath containing molten salts, or a water extinguisher near high voltage equipment.

LOW TEMPERATURES

12.11 Water and foam extinguishers are liable to be affected by low temperatures. Protection can be given by installing the extinguishers in heated cabinets, or for a limited period in insulated cabinets.

With water (gas cartridge), water (stored pressure) and certain types of foam (mechanical) extinguishers a non corrosive anti-freeze agent may be used as an alternative, to protect them from freezing, but the manufacturer of the extinguishers should first be consulted.

HIGH TEMPERATURES

12.12 High temperatures may lead to the rupturing of carbon dioxide, halon and stored pressure type extinguishers. Gas cartridges may also rupture. The suppliers should be consulted if the temperature of rooms where extinguishers are to be installed is likely to exceed 43 degrees C for old extinguishers or 60 degrees C for extinguishers conforming to British Standard 5423.

CORROSIVE ATMOSPHERES

12.13 Extinguishers sited in damp or chemically corrosive atmospheres need more frequent inspection and maintenance than is recommended below. They may need to be put in special enclosures.

SUITABLE EXTINGUISHERS FOR VARIOUS TYPES OF FIRE

ORDINARY COMBUSTIBLE MATERIALS

12.14 (a) WATER

The effectiveness of an extinguishing agent on fires in ordinary solid combustible materials (eg wood, paper, textile fabrics) depends principally upon its cooling action. Water has better cooling properties than other agents and is best for use on fires in these materials which may re-ignite if not adequately cooled. Also, water can penetrate readily to reach a deep-seated fire. This penetrating ability can be enhanced by the addition of wetting agents but these agents should be added only after consultation with the extinguisher supplier.

NOTE - Water is a conductor of electricity and must not be used on live electrical equipment.

(b) DRY POWDER

Multi-purpose dry powders based on mono-ammonium phosphate have a better performance on fires involving solid materials than ordinary dry powders based on sodium bicarbonate or potassium bicarbonate. After the powder cloud has knocked down the flames on a burning solid, it melts and forms a skin on the material. The melting has some cooling effect on the material and the skin has a smothering effect, reducing the rate at which flammable vapours are produced from the material.

FLAMMABLE LIQUIDS

12.15 (a) DRY POWDER

Dry powder is generally the best type of extinguisher for dealing with fires in flammable liquids. By extinguishing the flames over the liquid, dry powder acts more rapidly than foam and is particularly suitable for dealing with fires which may spread to surrounding materials before a complete foam blanket could be formed over the burning liquid. These extinguishers deal more effectively with large areas of burning liquid than other extinguishers of comparable size. They are effective too on fires in free-flowing liquids, especially where the liquid spills and spreads over a fairly large area. Dry powder is a non-conductor of electricity and can safely be used on fires when there is a risk of electric shock.

NOTE - The cooling properties of dry powder are limited and it gives no protection against re-ignition which may occur after application ceases. It is not as effective as foam on fires in liquid containers where the liquid has overheated either because it has been burning for some time or because it has been heated in a process.

12.15 (b) FOAM

Foam extinguishes a fire by forming a blanket on the surface of a burning liquid. The foam blanket remains in position for sufficient time to prevent re-ignition and to allow the liquid to cool. Foam extinguishers are, therefore, especially suitable for dealing with fires in which a liquid has been overheated, either because it has been burning for some time or because it was being heated in a process. Examples include; oil quench tanks, oil-filled boilers (where a sill is provided), and frying ranges.

12.15 (c) LIGHT WATER

`Light water' (a type of foam made by mixing a perflucarbon surface active agent, water and air) is particularly suitable for dealing with fires in low flash point liquids such as petrol on which a 9 litre extinguisher is capable of extinguishing a greater area of fire than the same size extinguisher containing protein foam. It has less resistance to burn back than protein foam, when a fire is not completely extinguished. Liquid surfaces are covered more readily with light water, and the surface active agent causes some of the water from the foam to form a thin layer on the surface of the flammable liquid which reduces the likelihood of re-ignition.

NOTE - It is difficult to form a blanket of foam on free-flowing liquid and quite impossible to do so when the liquid is flowing over a vertical surface. Liquids spilled on the floor or other horizontal surface may spread over a larger area than the normal discharge from a foam extinguisher can cover. A large number of liquids, such as alcohols, break down the foam produced by an ordinary portable extinguisher and prevent the formation of an effective blanket. Foam is a conducter of electricity and should not be used on live electrical equipment.

12.15 (d) CARBON DIOXIDE

Carbon dioxide, by extinguishing the flames over the liquid, acts more rapidly than foam and is more suitable for dealing with fires which may spread to surrounding materials before a complete foam blanket can be formed over the burning liquid. Carbon dioxide extinguishers are suitable for dealing with small fires involving escaping liquids on both horizontal and vertical surfaces. They are also suitable where the over-riding factor is to avoid damage or contamination by dry powder deposits or foam. Examples of risks where they are

especially suitable include; coating and spreading machines, delicate laboratory equipment. Carbon dioxide is a non-conductor of electricity.

NOTE - The cooling properties of carbon dioxide are limited and it gives no protection against re-ignition which may occur as the gas disperses rapidly. It is not as effective as foam on fires in liquids in containers where the liquid has over-heated because it has been burning for some time or because it has been heated in a process.

12.15 (e) HALONS

Halons, by extinguishing the flames over the liquid, act rapidly, and they are useful on fires in flammable liquids. They have a similar range of useful applications to carbon dioxide extinguishers but an important application is for dealing with fires in petrol and oil-driven engines. Halons are non-conductors of electricity.

NOTE - Should not be used or kept in confined spaces or any place where there is a risk that someone may inhale the vapours or the products formed when the vapours are heated by fire. Because of the damage to the ozone layer, the vapours should not be released for training purposes.

12.15 (f) FIRE BLANKETS

Fire blankets extinguish fire by smothering, and are suitable for small fires involving burning liquids and for cooking fat fires. They are also suitable where clothes are alight or to protect combustible material when sparks are likely, such as in welding or grinding operations.

FLAMMABLE GASES

12.16 No special provision can be made for dealing with fires involving gases because the only effective action against such fires is to stop the flow of gas. Indeed there will be a risk of an explosion if a fire involving escaping gas is extinguished before the flow of gas has ceased.

METALS

12.17 None of the extinguishing agents referred to in the preceding paragraphs will effectively deal with a fire involving metals. Special powders are available for dealing with burning metals and should be provided wherever there is a risk of fires involving such metals, for example, aluminium, magnesium, sodium and potassium.

12.18 CARBON DIOXIDE, HALONS AND DRY POWDER

Carbon dioxide, dry powder and halon extinguishers are suitable for use on live electrical equipment. The current should be turned off immediately the fire has been extinguished to prevent re-ignition. If the current can be turned off before the fire is tackled this is much the most effective course. Water or foam (which are conductors of electricity) should not be used on live electrical equipment because of the risk of shock. It is not always necessary to provide special extinguishers to supplement the protection given by water appliances in departments and buildings having limited quantities of electrical equipment eg where there are lights, wiring and a few small motors only. But of course the occupants must be taught to isolate the equipment whereupon water may be used.

Carbon dioxide and halon extinguishers are most suitable for dealing with fires involving electronic equipment in view of its delicate nature.

NOTE - Dry powder does not readily penetrate the spaces inside equipment.

USUAL CAPACITIES

12.19 The following are the normal capacities of extinguishers used although other sizes are available.

Type	Water	Foam	Dry Powder	Carbon Dioxide	Halon
Typical capacity	9 litres	9 litres	4 kg/9kg	2 kg	1.5 kg
Horizontal range	7m	5m	5m/6m	1m	3m
Total weight	15-18 kg	15-18 kg	8.5/18 kg	15 kg	2-3 kg
Area of flammable liquid fire extinguished		1 sq m	4.5/7 sq m	0.5 sq m	0.5 sq m

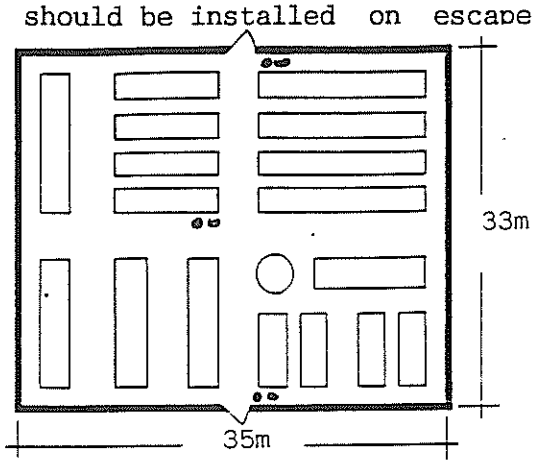
NUMBERS REQUIRED

12.20 As the most likely fire will be in ordinary combustible materials, water is normally the best agent. One extinguisher should be provided for each 210 sq m of floor area with a minimum of 2 to each storey (excepting premises with storey floor areas of less than 100 sq m when 1 extinguisher will be sufficient). In premises where the main risk is likely to be different (eg flammable liquids) then other extinguishers (eg dry powders) should be supplied at least at the same ratio.

SITING

12.21 Extinguishers for general protection should be as near as possible to exits or on staircase landings. They should be positioned within 30 m of one another. Where large undivided floor areas necessitate positioning appliances away from exits or outer walls, they should be installed on escape routes (see diagram 12.21).

diagram 12.21

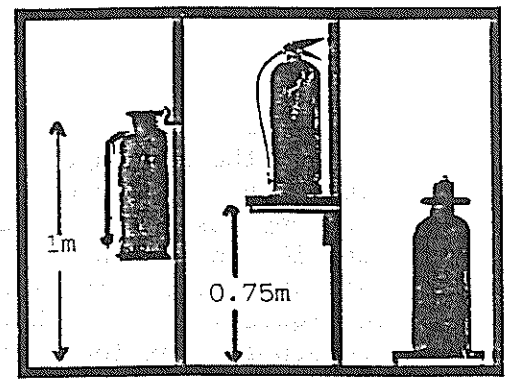


12.22 In buildings where there are perhaps hose reels, fire buckets, fire blankets, fire alarm call points and fire instruction notices as well as portable extinguishers, it is advantageous to group the equipment and notices together at fire points. Fire points make larger displays so that the equipment is easier to locate in an emergency, and valuable time can be saved if someone can go to one place to raise the alarm and collect the fire fighting equipment. However, where there are major flammable liquid and electrical equipment risks, the appropriate extinguishing equipment should be installed close to these risks.

INSPECTION AND TESTING

12.23 Extinguishers, spare gas cartridges and replacement charges should be examined at least monthly by a responsible person to make sure that appliances are in their proper positions and have not been discharged, or lost pressure (in the case of extinguishers fitted with a pressure indicator), or suffered obvious damage. The provision of brackets, shelves or base blocks will help to show if any appliance is missing (see diagram 12.23).

diagram 12.23



12.24 A more thorough inspection should be carried out at least once a year by a competent person eg a service man from the extinguisher suppliers, or from a firm specialising in this kind of work.

12.25 The dates of inspection and refilling should be indelibly recorded on a label securely attached to the extinguisher or painted on the body (it should not be stamped into the body of the extinguisher). Alternatively, the date may be recorded in a special register, each extinguisher should have an identification to correspond with the item in the register.

13. PHYSICALLY DISABLED AND SENSORY IMPAIRED PEOPLE

13.1 It is essential to identify the special needs of disabled people when planning fire precautions and means of escape in places of work.

13.2 British Standard 5588 : Part 8 Code of practice for means of escape for disabled people, provides guidance on the measures to be incorporated into new buildings or existing buildings which have been altered, to enable the safe evacuation of disabled people in the event of fire. It is accepted that it may not always be possible to fully comply with the code in existing buildings and in these circumstances alternative ways of meeting its objectives should then be sought.

13.3 Management should draw up fire precautions for the work place in consultation with staff who have disabilities and/or sensory impairments and by obtaining any necessary specialist advice.

PEOPLE WITH IMPAIRED VISION

13.4 People with impaired vision or colour perception may experience difficulty in recognising fire safety signs. Such signs should therefore be sited so that they are easily seen and readily distinguishable. Management may obtain advice about the siting of notices from the Royal National Institute for the Blind or the National Federation of the Blind of the UK.

13.5 Management should ensure that any employees with impaired vision familiarise themselves with escape routes, especially those which are not in general daily use.

13.6 Where possible, management should arrange for a normally sighted person to work near any employee with impaired vision to warn and reassure them in the event of fire and to accompany them along the escape route. It is recommended that the sighted person should lead, inviting the other person to grasp their elbow or shoulder lightly as this will enable the person being assisted to walk half a step behind and thereby gain information about doors and steps, etc. Assistance should be offered to guide dog owners and it is recommended that the helper holds the leash and not the dog's harness.

13.7 After leaving the building, people with impaired vision will generally head in the direction most familiar to them. It is important that management ensure that they are not abandoned at this point but led to a place of safety, with a normally sighted person remaining with them until the emergency is over.

PEOPLE WITH IMPAIRED HEARING

13.8 People with impaired hearing may experience difficulty in hearing a fire alarm. However, impairment of hearing does not mean that a person is completely insensitive to sound. Many people with severe impairment have sufficiently clear perception of some types of conventional audible alarm signals to require no special provision. Where this is not the case management should ensure that a person with normal hearing is available to alert any with impaired hearing to the need of evacuation.

13.9 In certain situations, such as premises where profoundly deaf people form the majority of employees, alternative types of alarm signal may be necessary, eg lights or other visual signals, vibrating devices, or sound signals within certain selected frequency bands. Management may obtain technical advice on the selection of suitable devices from the Royal National Institute for the Deaf. As alternative alarm signals may have unwanted side effects they should only be installed following consultation between management and employees.

INDUCTION LOOP SYSTEMS

13.10 Induction loop systems, used in some premises for audio communication with people with suitable hearing aids, are not considered acceptable means of alerting hearing-impaired people in the event of fire. Where such systems are in normal use, however, they may be used to supplement the alarm.

WHEELCHAIR USERS AND PEOPLE WITH IMPAIRED MOBILITY

13.11 The safety of wheelchair users and people with impaired mobility in the event of fire will normally be assured provided the recommendations of British Standard 5588 : Part 8 are followed and the requirements of the Fire Brigade are fully met.

MENTALLY HANDICAPPED PEOPLE

13.12 Management should ensure that any mentally handicapped people are reassured in the event of fire and led to a place of safety. They should not be left unattended.

USE OF LIFTS

13.13 Disabled people may rely on a lift as a means of escape only if it is an evacuation lift or a firefighting lift operated under the direction and control of management using an agreed evacuation procedure. The recommendations in paragraph A.3 of appendix A to British Standard 5588 : Part 8 should be followed.

SOURCES OF ADVICE

13.14 Access Committee for England/Centre on Environment for the Handicapped, 35 Great Smith Street, London SW1P 3BJ;

Disabled Living Foundation, 380-384 Harrow Road, London W9 2HU;

Guernsey Bailiwick Association for the Hard of Hearing and Deaf, Tel 38303;

Guernsey Blind Association, Tel 20646;

Liaison Officer for the disabled. Guernsey Telecomms Tel 711221

Motor Neurone, Tel 57291;

Multiple Sclerosis Society, Tel 63834;

National Federation of the Blind of the UK, Unity House, Smyth Street, Westgate, Wakefield, West Yorkshire WF1 1ER;

Royal Association for Disability and Rehabilitation, 25 Mortimer Street, London WI9 8AB;

Royal National Institute for the Blind, 224 Great Portland Street, London WIN 6AA;

Royal National Institute for the Deaf, 105 Gower Street, London WC1E 6AH;

Society for Physically Handicapped, Tel 24333.

14. ADVICE TO MANAGEMENT ON FIRE INSTRUCTION AND DRILLS

14.1 It is possible that the information in this chapter, more than any other, will affect the safety of persons in the building. No matter how high the inbuilt standard of protection from fire, careless or uninformed persons can always negate the safeguards against fire by blocking exits, wedging fire doors open, misusing fire extinguishers, panicking during an emergency etc. It also needs to be said that fire conscious and well informed staff can sometimes compensate for unexpected failure of normal precautionary measures.

14.2 All persons employed in buildings for which registration is required should be instructed and trained to ensure that they understand basic fire precautions and the action to be taken in the event of a fire. This should include persons on regular duties or shift duties outside normal working hours, including part time staff, cleaners etc. Training should be based on written instructions but is is important that they are specific to individual premises. Reliance upon a standard instruction of a type used by many large organisations may not be satisfactory without modification to suit individual needs. (See paragraph 14.10 for example.)

NOTE: Where an application for registration has been made, and you are awaiting a Fire Brigade inspection, interim measures should be made to secure that instruction and training is given.

14.3 Instruction should be given frequently by competent persons, at such intervals as will ensure that all employed persons are instructed preferably at least twice and in all cases at least once in each period of twelve months. It is particularly important that newly appointed staff are made aware of the means of escape and fire procedures at the commencement of their employment.

14.4 Instruction and training should provide for the following -

(a) the action to be taken upon discovering a fire;

(b) the action to be taken upon hearing the fire alarm;

(c) raising the alarm, including the location of the alarm call points, the internal fire alarm telephones and the location of the alarm indicator panels;

(d) the correct method of calling the Fire Brigade;

(e) the location and use of fire equipment;

(f) knowledge of escape routes, particularly any not in regular use;

(g) knowledge of the method of operation of special escape door fastenings;

(h) appreciation of the importance of fire doors and the need to close all doors at the time of a fire and on hearing the fire alarm;

(i) stopping machines and processes and isolating power supplies where appropriate;

(j) during staff drills and training, all escape doors, not in regular use, should be operated to ensure that they function satisfactorily and this will also assist in staff awareness of all facilities;

(k) evacuation of the building (where members of the public are present, this will include reassuring them and escorting them to exits etc) and where appropriate, an assembly point.

NOTE - It is important that all members of staff take part in fire drills. False alarms which could be of nuisance value only can be used to good effect if they are treated as a drill. With no one being aware that it is a false alarm, the full procedure can be gone through including full evacuation and calling of the Fire Brigade (although the Fire Brigade should not be called if it is a known false alarm).

14.5 In addition to the above, certain categories of staff should be instructed and trained in matters peculiar to their particular responsibilities at the time of a fire. Examples are -

(a) heads of departments;

(b) engineering and maintenance staff;

(c) floor supervisors;

(d) security staff;

(e) telephonists (this is particularly relevant where two stage alarm arrangements are employed).

DRILLS

14.6 At least once a year a practice fire drill should be carried out simulating conditions in which one or more of the escape routes from the building is obstructed. During these drills the fire alarm should be operated by a member of staff who is told of a supposed outbreak, and thereafter the fire routine should be rehearsed as fully as circumstances allow.

RECORDS

14.7 Such details as are necessary to show the training and instruction given should be recorded in a logbook. The following are examples of matters which may need to be included in such a record -

(a) date of the instruction;

(b) duration;

(c) name of the person giving the instruction;

(d) names of the persons receiving the instructions; and

(e) the nature of the instruction, training or drill.

14.8 In all premises one person should be responsible for organising fire instructions and training and in larger premises a person or persons should be nominated to co-ordinate the actions of the occupants in the event of a fire.

FIRE INSTRUCTION NOTICES

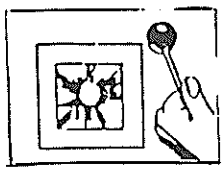
14.9 At conspicuous positions in all parts of the building printed notices should be exhibited stating in concise terms the essentials of the action to be taken upon discovering a fire and on hearing the alarm. (See 14.10 for example.)

14.10

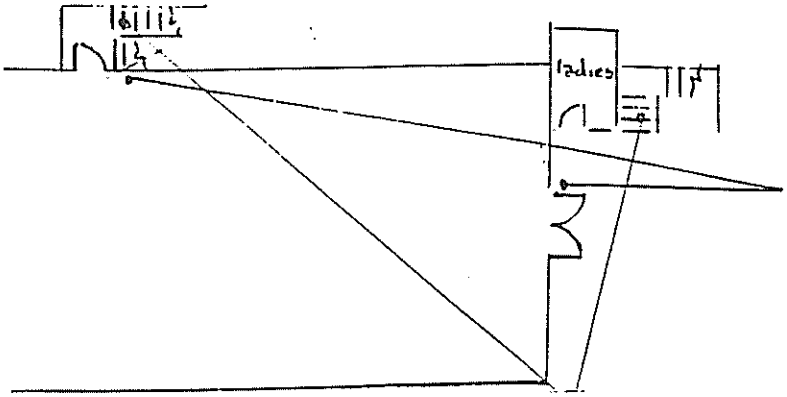
F I R E

What you should do !

If you discover a fire



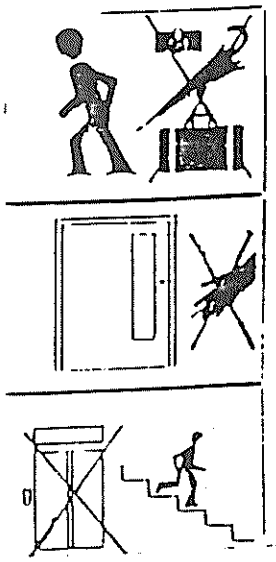
Raise the alarm by breaking the glass of the nearest fire alarm operating point



Attempt to extinguish the fire. Extinguishers are located, but DO NOT RISK PERSONAL INJURY

On hearing the fire alarm

Leave the building at once, quickly and calmly by the nearest available route



DO NOT stop to collect personal belongings

If you suspect that there is a fire on the other side of a door

DO NOT open it

DO NOT use the lifts

When clear of the building

DO NOT re-enter

Proceed to assembly point at .....