

Fire Safety in Nursing Homes

**A Guide to Fire Safety in Existing
Nursing Homes and Similar Type
Premises**

Dublin

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Foreword

In recent years advice has been published on fire safety in various types of premises including hotels, guesthouses, places of assembly and flats. This Guide to Fire Safety in Nursing Homes is now added to the series of fire safety publications.

The Guide is intended to assist persons in charge of nursing homes in meeting their responsibilities for fire safety. I would urge them to study carefully and to apply the guidance in this publication.

Le blianta beaga anuas, foilsíodh comhairle maidir le sábháilteacht ó dhóiteáin i gcineálacha éagsúla áitribh, ar a n-áirítear óstáin, tithe aíochta, ionaid tionóil agus árasáin. Anois, tá treoir faoi shábháilteacht ó dhóiteáin i dtithe banaltrais le fáil sa tsraith foilseachán faoi shábháilteacht ó dhóiteáin.

Tá an Treoir ceaptha cabhrú le daoine atá i mbun tithe banaltrais a bhfreagrachtaí i ndáil le sábháilteacht ó dhóiteáin a chomhlíonadh. D'iarrfainn orthu grinnstaidéar a dhéanamh ar na treoracha san fhoilseachán seo agus iad a fheidhmiú.



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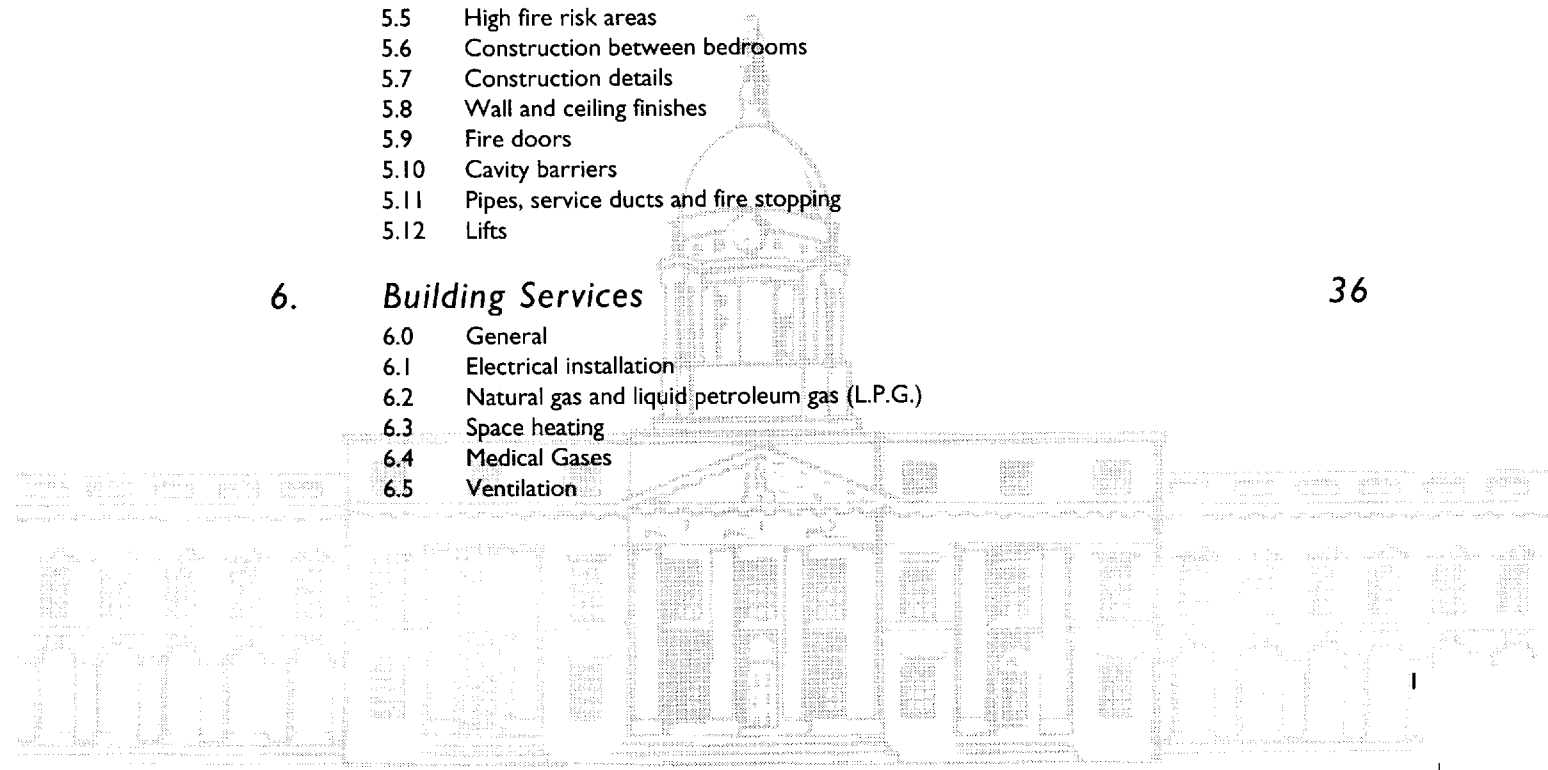
I am glad to record my appreciation of their assistance.

A handwritten signature in black ink, appearing to read 'Brendan Howlin'.

Brendan Howlin T.D.,
Minister for the Environment
July, 1996

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Chapter 1

Introduction

1.1 Reason for this Guide

The purpose of this Guide is to assist persons in discharging their statutory fire safety responsibilities under the Fire Services Act, 1981 in relation to nursing homes.

Section 18(2) of the Act places a duty on persons having control over premises to which the section applies to

"take all reasonable measures to guard against the outbreak of fire on such premises" and

"ensure as far as is reasonably practicable the safety of persons on the premises in the event of an outbreak of fire".

Section 18(3) places a duty on every person on such premises to conduct himself in such a way as to

"ensure that as far as is reasonably practicable any person on the premises is not exposed to danger from fire as a consequence of any act or omission of his".

Premises to which Section 18 applies include those used

- for the provision of sleeping accommodation,
- as an institution providing treatment or care, and
- for any purpose involving access by the public, on payment or otherwise.

While the Guide is aimed primarily at persons in control such as owners and managers it also has application to staff, residents, visitors, maintenance personnel. The Guide may also assist persons responsible in discharging many of their fire safety duties under the Nursing Home (Care and Welfare) Regulations.

1.2 Interpretation

Users of the Guide are advised that the interpretation and application of the technical recommendations of the Guide

should be entrusted to suitably qualified and competent persons. The recommendations contained in Chapters 4 to 9 in particular are of a technical nature. They are primarily intended to be used by advisers to the persons having control over nursing homes and by officers of fire authorities. It is recognised that as existing nursing homes are located in many different building types there will be a need for flexibility in the implementation of the Guide's recommendations in particular cases. The provisions of the document are an aid to, and not a substitute for, professional judgement and common sense.

This Guide refers to a number of technical standards and codes of practice. It is important for users of the Guide to refer to the latest edition of a standard or code, together with the latest published amendments.

The diagrams in this Guide are not drawn to scale. They are intended to illustrate points under discussion and should not be interpreted in any other way.

1.3 Principles of Fire Safety

The fire safety principles on which the Guide is based are adopted primarily to protect life. These principles may be summarised as follows:

- management of fire safety
- avoidance of outbreaks of fire
- early detection of fire and early warning to staff to facilitate an adequate response
- compartmentation of building and provision of escape routes, which are protected from fire and smoke
- limitation of the development and spread of fire
- containment of fire and smoke to the compartment where the fire originates
- early suppression of fire, where this is feasible
- effective evacuation procedures and
- access and facilities for the fire service.

1.4 Legal Provisions

The primary legislation relating to fire safety in buildings in Ireland is the Fire Services Act, 1981, and the Building Control Act, 1990, and regulations made under these Acts. The Nursing Homes Regulations, 1993 and 1994, are also relevant.

The recommendations in this Guide are advisory only and are not statutory requirements, compliance with them does not confer immunity from statutory obligations nor exempt a person from the need to ensure that any relevant statutory requirements are complied with.

The Fire Services Act, 1981

This Act makes provision for the establishment of fire authorities and the organisation of fire services and for fire safety, fire fighting, the protection and rescue of persons and property, and related matters. The main provisions of the Fire Services Act, as it relates to premises such as nursing homes, are set out in Appendix A to this guide.

The Building Control Act, 1990

The Building Control Act, 1990, provides for matters relating to the construction, alteration, extension or change of use of buildings.

The Building Regulations, 1991, set out the requirements, including fire safety requirements, to be observed in the design and construction of certain buildings or works.

The Building Control Regulations, 1991, prescribe certain procedures to be observed in relation to the design and construction of certain buildings or works, including application for fire safety certificates and notice of commencement of works.

In an existing building, where works are required to achieve the standards of fire safety in accordance with the recommendations of this Guide, such works are not exempt from the requirements of Building Control legislation. However, in the case of a material alteration of an existing building used as a nursing home, the requirements of certain

parts of the Building Regulations in relation to such works may be met by the application of the provisions of this Guide.

The main provisions of the Building Control Act and related regulations, as they relate to nursing homes, are set out in Appendix B to this Guide.

The Health (Nursing Homes) Act, 1990

This Act places a statutory duty on nursing home proprietors to apply for registration and on health boards to register nursing homes and their proprietors and to maintain a register of such homes; it brings voluntary and private nursing homes under a common system of registration and inspection; it provides for regulations to govern the standards of care in nursing homes and introduces new subvention arrangements for the maintenance of dependent persons in nursing homes by health boards.

The Nursing Homes (Care and Welfare) Regulations, 1993 and the Nursing Homes (Care and Welfare) (Amendment) Regulations, 1994, contain provisions for the purposes of ensuring that adequate and suitable care and accommodation are provided for dependent persons in nursing homes. The regulations contain requirements in relation to fire precautions and fire records.

The main provisions of the Health Care (Nursing Homes) Act and related regulations, as they relate to nursing homes, are set out in Appendix C to this guide.

Copies of the above mentioned Acts and Regulations may be purchased from the Government Publications Sale Office, Sun Alliance House, Molesworth Street, Dublin 2.

Chapter 2

Scope and Application

2.1 Scope of the Guide

This Guide addresses fire safety in existing nursing homes and similar type premises. It discusses and makes recommendations on building layout, construction, fire protection facilities, fire safety management and other measures to minimise the danger to life and damage from fire.

It should be noted that the recommendations on fire safety management (see Chapter 3) apply to all existing nursing homes, while the other recommendations of the guide are intended to apply to nursing homes which were constructed and in use as nursing homes prior to the coming into operation of the Building Regulations, 1991.

2.2 Premises to which the Guide applies

Subject to paragraph 2.1, this Guide applies to existing nursing homes, and similar type premises, which provide sleeping accommodation and care for dependent persons.

2.3 Application of the Guide

The Guide sets out general principles of safety which should be applied having regard to the individual circumstances of each premises. Factors, such as the number of storeys, the form of construction, internal layout and the number of persons to be accommodated, affect life safety and, consequently the level of fire protection required in a particular case.

In each case it is necessary to consider:

- the effects of a fire occurring in any room or part of the building;
- the danger that this poses to life safety;
- the fire protection provided in the premises; and
- the capacity of staff to respond effectively to an outbreak of fire.

Maximum benefit will be obtained only when the recommendations of the Guide as a whole are applied as part of a comprehensive approach to life safety. If the recommendations are correctly applied this should minimise the occurrence of fires in nursing homes and the potential for fatalities, injuries and damage.

Persons having control over nursing homes are urged to review the fire safety of their premises by reference to the recommendations in this Guide. In many cases, the persons concerned will have been fully aware of the need for such precautions and will have taken action to ensure fire safety by measures of the type recommended in the Guide, or their equivalent.

Some of the recommendations of the Guide (e.g. fire safety management measures) are unlikely to involve significant additional expenditure. However, where major investment may be necessary to implement the Guide's recommendations, immediate steps should be taken to draw up in consultation with the fire authority where appropriate, a programme for the elimination of deficiencies on a planned basis, with a view to achieving a structured remedying of deficiencies as soon as possible.

2.4 Equivalent Fire Safety

Guidance contained in this document with respect to the use of a particular material, method of construction, standard or other specification does not preclude the use of any other suitable material, method of construction, standard or specification which would achieve an equivalent level of fire protection.

The methods used to demonstrate equivalency should be based on fire safety engineering principles and the application of professional judgement. Guidance on the use of a fire safety engineering approach is contained in Technical Guidance Document B published under Article 5 of the Building Regulations, 1991.

Chapter 3

Management of Fire Safety

3.0 Fire Safety Management: General

As indicated in 1.1 persons in control of nursing homes have a statutory responsibility to take all reasonable measures to prevent the occurrence of fires and to ensure as far as is reasonably practicable the safety of the occupants in the event of fire occurring on the premises. Staff, residents and all other persons on the premises also have responsibilities in relation to fire safety.

The following sections provide guidance for the fire safety management of nursing homes.

3.1 Management Duties

The implementation of a "Fire Safety Programme" should be an integral part of the day-to-day management and operation of a nursing home. A fire safety programme incorporating arrangements for the following should be prepared for each individual premises:

- (i) prevention of outbreaks of fire, through the establishment of fire prevention practices (see 3.2);
- (ii) instruction and training of management and staff in all matters relating to fire safety (see 3.3);
- (iii) emergency procedures, including fire and evacuation drills (see 3.4);
- (iv) maintenance of fire protection equipment (see 3.5);
- (v) maintenance of the building and its fittings and services (see 3.6);
- (vi) maintenance of escape routes (see 3.7);
- (vii) liaison with the fire authority and assisting the fire brigade (see 3.8);

(viii) maintaining a fire safety register (see 3.9) and

(ix) provision and maintenance of fire safety signs and notices (see 3.10)

A responsible person should be designated as Fire Safety Manager for the implementation and overseeing of the fire safety programme for the nursing home. Deputy Fire Safety Manager(s) should be appointed to deputise or assist, as necessary.

The fire safety programme should set out fire safety management policy including a brief statement listing the names and positions of the persons responsible for these arrangements.

The fire safety programme will be a confirmation of the good housekeeping practices in the nursing home. The implementation of the fire safety programme should result in the continued monitoring and application of effective fire safety practices in the nursing home.

3.2 Fire Prevention

Fire prevention measures are a key element. They involve the identification and elimination of potential fire hazards both inside and outside the building and the establishment of good housekeeping practices. The following fire prevention measures are recommended for all nursing homes.

3.2.1 Disposal of Waste

Arrangements should be made for the collection and removal of waste material and refuse at regular intervals. Pending removal, waste should be stored in suitable non-combustible containers, at a designated location, away from sources of ignition. Waste containers should never be stored in escape routes. Staff should be made aware of the importance of not accumulating rubbish or waste on any part of the premises and especially in escape routes.

3.2.2 Smoking

Smoking should be restricted to particular areas in the nursing home such as a lounge, sitting room or conservatory. Smoking should not be permitted in bedrooms, kitchens or laundries. In areas where smoking is permitted suitable ashtrays should be provided. Ashtrays should be emptied frequently into metal bins, with smouldering material being first extinguished.

3.2.3 Electrical Installations and Appliances

The inspection and testing of electrical installations and appliances is dealt with in Chapter 6 of this guide. Staff should be trained to use electrical equipment correctly and safely. Defective equipment should not be used; repairs as appropriate should always be carried out by competent persons. Care should be taken with the use in bedrooms of electrical appliances, such as electric blankets, heaters, televisions, hair-dryers, etc.

3.2.4 Kitchens

Good housekeeping practices are critical to fire safety in kitchens. Cookers, extract fans, fume extraction hoods, filters, ducts and any other machinery should be regularly cleaned of oil, grease and dust. All kitchen equipment should be serviced regularly. Gas, oil and electrical cut-off switches and valves should be provided in clearly marked and accessible areas at a safe distance from the equipment which they serve. Kitchen staff should be particularly vigilant when using oil and fats for cooking. They should also be familiar with the location and correct use of first-aid fire-fighting equipment, such as fire extinguishers and fire blankets, and with the operation of any fixed suppression systems.

3.2.5 Open Fires and Portable Heaters

Open fires should not be provided in bedrooms. Where an open fire is provided in a sitting room or lounge it should be protected by a strong spark-proof fireguard. In some nursing homes it may be prudent not to provide open fires at all, having regard to the state of health, mobility, etc., of the residents. Fuel and lighting materials should be stored safely. Portable heaters should not be used in nursing homes.

3.2.6 Renovation and Maintenance Work

Building work, decorating and maintenance can give rise to an increased risk of fires. The nature of any proposed work in or around a premises should be considered and should be supervised by a competent person to ensure that safe systems of work are followed. Escape routes should not be blocked. Access by residents to areas of work should be restricted. Where work involves removing or switching off fire protection facilities, alternative arrangements should be made to maintain safety levels. Hot works of all type, but particularly where roofing materials are involved, are particularly hazardous and should be treated with extreme care to avoid accidental ignition. Hazardous equipment and materials should be removed from the building at the end of each working day and a final check should be made to ensure that no fire danger remains after work finishes.

3.2.7 Laundries

In nursing homes a separate room may be dedicated for use as a laundry or utility room. Such rooms pose particular fire hazards, such as:

- (a) spontaneous combustion of compacted linen which has been tumble dried. This problem may be prevented in a number of ways. Ideally tumble driers should have automatic cooling at the end of the drying cycle. This is especially important where laundry work is programmed to avail of night-rate electricity charges. Linen should not be over-dried and tumble driers should be unloaded immediately after use and left empty. Operators should separate and fold tumble dried material as soon as practicable, but in any case it should be loosened to dissipate heat on being taken from the machine.
- (b) solvents which are highly flammable are sometimes used for spot cleaning. Only small quantities needed for immediate use should be kept in the laundry. The main bulk of this type of liquid and general cleaning solvents should be stored in the open air or in specially designed stores. Containers for solvents should be kept closed to prevent the vapours leaking. Smoking should be

prohibited in laundries and signs to this effect should be displayed.

- (c) fluff or lint which is extremely flammable can accumulate in laundries. A programme should be instituted to remove build-up of such materials, especially from hot areas such as electric motors, and other hidden locations.

3.2.8 Fuel Storage

Solid fuel for open fires should be stored in special storage areas outside the building, except for small amounts for immediate use. Only staff should be permitted to put fuel on open fires. Fuel should not be kept in escape routes or in areas where it could be ignited accidentally. Other fuels, such as heating oils or liquified petroleum gases, should be stored in accordance with the requirements of the relevant standard indicated in Chapter 6 to this Guide.

3.2.9 Use of Medical Gases

Fire can occur when flammable materials are exposed to an ignition source in the presence of atmospheric oxygen. The use of medical gases, such as oxygen or nitrous oxide, can produce an oxygen-enriched atmosphere that greatly increases the risk of combustion. Special precautions are necessary where these gases are in use or stored, to avoid contact with flammable materials and sources of ignition. Where oxygen therapy equipment is in use, fire and safety warning signs should be conspicuously displayed.

3.2.10 Fire Doors

Fire doors play an important role in the fire safety strategy for nursing homes. Fire doors should normally be kept closed, unless they are held open by electro-magnetic devices connected to the fire detection and alarm system. Fire doors should never be held open by wedging or propping.

Each door fitted with an automatic door release should be closed at a predetermined time each night and remain closed throughout sleeping hours. If this is impracticable, it should be the responsibility of a competent member of staff to operate the release mechanism at least once a week to

ensure that the mechanism is working effectively and the doors close correctly onto their frames.

3.3 Fire Safety Management and Staff Training

For a fire safety programme to be effective both management and staff need to know and understand their individual and collective roles in the fire safety management of the nursing home. Comprehensive instructions and training should be given to all concerned. A record of all training given and training courses attended should be kept in the fire safety register.

3.3.1 Staff Training

All staff, including temporary and part-time staff, should receive training and instruction in relation to the following:

- fire prevention duties (see 3.2);
- emergency procedures, including fire and evacuation drills (see 3.4);
- the layout of the building including escape routes;
- the location of fire alarm call points, and first-aid fire-fighting equipment;
- arrangements for the evacuation of residents, including phased evacuation, and the location of places of relative safety;
- arrangements for calling the fire brigade and the ambulance service;
- arrangements for assisting the fire brigade;
- fire control techniques including:
 - the use of fire extinguishers, fire blankets and hose reels;
 - closing doors and windows to inhibit fire growth and spread;
 - shutting off electricity and fuel supplies where appropriate;
- the role of fire doors and the importance of not wedging or propping them open (see 3.2.10).

3.4 Emergency Procedures

If a fire occurs in a nursing home it is imperative that management and staff are able to respond effectively by calling the fire brigade and beginning the evacuation procedures (3.11), as appropriate.

The fire safety programme should include a predetermined plan, setting out emergency procedures for the nursing home. The nature of the occupancy is such that effective emergency evacuation procedures are crucial. The predetermined plan of emergency procedures should include:

- a procedure for raising the alarm;
- a procedure for investigating automatic alarms;
- a procedure for calling the fire brigade and the ambulance service;
- an evacuation procedure (see 3.11);
- a procedure for fighting the fire using first-aid fire-fighting equipment if it is safe to do so;
- a procedure for reporting to a designated location;
- a procedure for accounting for each person on the premises;
- a procedure for assisting the fire brigade on their arrival.

3.4.1 On Discovering a fire

In the event of an outbreak of fire, staff should be trained to follow pre-determined procedures and arrangements, including the following:

- assessment of the situation (see 3.11.2);
- operation of the alarm system;
- calling the fire brigade;
- alerting of management and other staff;
- initiation of evacuation (see 3.11), if appropriate;
- fighting the fire if it is safe to do so using the nearest suitable equipment;
- closing all doors as areas are vacated, checking that nobody is left behind;
- assembling at the designated assembly point;
- assisting the fire brigade on arrival.

The order and extent of the pre-determined procedures to be carried out will depend on the initial assessment of the emergency situation and on the particular circumstances.

3.4.2 On hearing an alarm or other warning

On hearing the alarm or on being alerted to an emergency fire situation, staff should:

- implement the appropriate actions (see 3.4.1);
- report to the designated persons or location;
- carry out any specific assigned tasks or other instructions.

3.4.3 Fire and Evacuation Drills

Fire and evacuation drills should be held with the objectives of:

- familiarising staff with their roles;
- testing the availability and effectiveness of staff;
- identifying shortcomings in the procedures.

Practice fire drills should be carried out at least twice a year. It should be assumed, in as far as is practicable, that a fire situation has occurred and the actions expected to be performed should be rehearsed. These would include raising the alarm, checking of escape routes and simulated evacuation (using staff as "residents"), use of fire extinguishers, etc.

Those participating in fire and evacuation drills should be encouraged to apply the procedures efficiently and promptly. Each drill should be reviewed afterwards and the procedures modified if necessary. Each drill should be recorded in the fire safety register (3.9).

3.5 Inspection and maintenance of fire protection equipment

The safety and protection of the residents and staff of a nursing home will depend greatly on the reliable functioning of fire protection equipment such as fire detection and alarm systems, emergency lighting systems and fire extinguishing equipment. In existing buildings there may be a high degree of reliance upon these "active" fire precautions. A high level

of responsibility rests therefore with the person in control of a nursing home to ensure that fire protection equipment is installed, tested and maintained to the highest standards.

Details and reference standards for inspection and maintenance procedures for fire protection equipment are given in Chapter 4: Means of Escape and in Chapter 8: Fire Fighting Equipment.

All information relating to the inspection, testing and maintenance of fire protection systems and equipment should be recorded in the fire safety register (see 3.9).

3.6 Maintenance of the building and its services

The condition of a building may deteriorate over time thereby reducing fire protection levels. The integrity of walls, doors or floors, which are part of fire compartmentation or the protection of escape routes, must always be maintained. Fire doors in particular should be checked regularly to ensure that they are in effective working order.

The fittings, equipment and services in a building can cause or contribute to fire. Arrangements should be made for the regular checking of furnishings and fittings, electrical installations and appliances, and heating, kitchen and laundry equipment. A record of these checks and deficiencies and remedial and maintenance work should be kept in the fire safety register (see 3.9).

3.7 Maintenance of escape routes

Residents of a nursing home cannot be evacuated quickly and safely if escape routes are obstructed or exits locked. It is an essential element of fire safety management that all escape routes are kept free from obstruction and safe from smoke and fire. This can be achieved only if escape routes are not obstructed, if fire-resisting doors are kept closed and if exit doors are readily usable at all times. Escape routes should be inspected on a regular basis. If an obstruction is noticed in an

escape route it should be removed immediately and any necessary steps taken to prevent a recurrence.

The following precautions should be taken in relation to all escape routes:

- escape routes should not be obstructed and should be available for use at all times;
- escape routes should not be used for storage of any type;
- upholstered furniture should not be provided in corridors or within stairway enclosures;
- doors on escape routes should be capable of being readily and easily opened at all times;
- curtains, drapes or hangings should not be placed across or along an escape route in a manner which would impede or obstruct escape;
- floor coverings should not present a slip or trip hazard in the escape routes;
- external areas at or near exits should never be obstructed.

3.8 Liaison with the fire authority and assisting the fire brigade

It may be appropriate to liaise and consult with the fire authority with the following objectives:

- familiarisation of the fire brigade with the premises;
- to ensure the availability of access and appropriate facilities for the fire brigade;
- assistance on fire safety management;
- advice on fire safety matters generally.

3.9 Fire Safety Records

A fire safety register for the premises should be established and maintained. The register, which is a complete record of all fire safety matters for the premises, should be kept on the premises at all times. It should be kept up-to-date and made available for inspection by authorised officers of the fire authority.

The following information should be recorded in the fire safety register:

- the name of the nursing home owner;
- the name of the matron or person in charge;
- the name of the fire safety manager and deputy fire safety manager(s);
- details of specific fire safety duties that have been assigned to specified staff members;
- details of instruction and training given to staff, and by whom;
- details of each fire and evacuation drill;
- details of fire protection equipment and systems in the premises;
- details of inspection and testing of fire protection equipment and systems, with brief comments on the results of the checks and actions taken to remedy defects;
- details of all fire incidents and false alarms that occur and the actions taken as a result.

3.10 Fire Safety Signs and Notices

Signs should be provided which indicate the direction of escape and the location of exit doors. They should be prominently displayed and should be visible on failure of the mains electrical supply (see 4.6).

Signs should be provided to indicate the position of fire-fighting equipment and fire alarm call points.

Signs, in accordance with BS 5499: Part 1: 1990, should be provided on fire doors, except those held open by electro-magnetic devices connected to the fire alarm, to indicate that they should be kept shut.

No-smoking signs also should be provided at appropriate locations.

Notices should be provided at appropriate locations to indicate the procedures to be followed by staff in an emergency such as "on discovering a fire", or "on hearing the

fire alarm". Staff should be familiar with the content of such notices.

Attention is drawn to Statutory Instrument S.I. No. 132 of 1995: Safety, Health and Welfare at Work (Signs) Regulations, 1995. Emergency escape signs, fire-fighting equipment signs, and no smoking signs should be in accordance with the provisions of these Regulations. Other signs may also be required for the purpose of these Regulations, but these are outside the scope of this guidance document.

3.11 Evacuation Procedures

3.11.1 General

The principles of means of escape in case of fire are discussed in Chapter 4 of this guide. The emergency procedures (see 3.4) include evacuation plans for the building. All members of staff should be familiar with the details of these plans. It is also essential that the plans are practised on a regular basis to ensure that evacuation can be carried out effectively in a real emergency.

Familiarity with the requirements of evacuation is essential for all staff members. Because of differences in the layout of buildings, the evacuation methods should be developed to suit the individual circumstances. The procedures and techniques involved should be as simple as practicable and easily performed by a minimum number of staff.

The presence of an adequate number of staff at all times to deal effectively with any emergency and to carry out evacuation as required is essential. This is particularly important at night, when there are minimum staff levels. The number of staff may need to be supplemented if the residents are highly dependent. Trained staff must be able to respond promptly and effectively to any emergency and this is a vital factor in limiting the consequences of an outbreak of fire. Staff should be trained in the methods of evacuation appropriate to the degree of dependency of those under their care.

3.11.2 Assessing the Situation

The situation should be assessed before the decision to evacuate is made. In doing this, consideration should be given to :

- the location of the fire;
- the seriousness and extent of the fire;
- the presence and extent of smoke;
- the proximity of flammable materials;
- whether the immediate action taken to control the fire is having the desired effect;
- the nature and type of resident in the vicinity.

IF IN DOUBT, EVACUATE!

The authority to order the evacuation should be clearly established in the emergency procedures. The authorised persons should act on their own initiative, pending the arrival of the fire brigade. Evacuation should be conducted in distinct stages, as outlined at section 4.1, having regard to the priorities outlined at 3.11.3 below.

3.11.3 Evacuation Priorities

The first priority is to move any residents who are in immediate danger to a safe area. For the purpose of speedy evacuation, it is normal to carry out the evacuation of residents in the following order of priorities:

- (a) ambulant residents, requiring only a member of staff to guide or direct them;
- (b) semi-ambulant residents, requiring minimum assistance;
- (c) non-ambulant residents who have to be physically moved or carried.

3.11.4 Evacuation Techniques

Special care will be needed in the evacuation of non-ambulant residents and staff should be trained to cope with these difficult situations. Various items of equipment may be employed to assist with evacuation, including wheeled trolleys and wheelchairs, blankets, carry sheets, stretchers,

evacuation sheets, etc. It is important to ensure that a sufficient number of staff are available for effective evacuation, when required.

Attention is drawn to the provisions in relation to manual handling of loads contained in the Safety, Health and Welfare at Work (General Applications) Regulations, 1993 (S.I. No. 44 of 1993). Patient handling requires specialist training and is outside the scope of this guidance document.

Staff members should be trained in the evacuation techniques that are most appropriate to the particular circumstances.

Chapter 4

Means of Escape

4.0 Means of Escape: General Principles

When a fire occurs in a building, large quantities of smoke and gases are produced. Smoke and hot gases may travel considerable distances within a building and will present a direct threat to life. Visibility also is considerably reduced, thereby affecting the viability of escape routes within and from the building.

In nursing homes, many of those who will require to escape may be partially or totally reliant upon the assistance of staff or other able-bodied people to leave the premises. In many cases it will not be practicable, or necessarily desirable, to immediately evacuate persons from the building. The time and effort required for evacuation may be considerable and it will generally be necessary to carry it out in a phased manner.

Because of the constraints, the strategy generally adopted in nursing homes is to initially evacuate only those who are immediately at risk from the fire. These are those persons in the areas immediately adjacent to where the fire has started. It is necessary to move them quickly to a place of relative safety within the building. It may not be necessary, initially, to evacuate these persons from the building.

Places of relative safety are areas which are sufficiently remote and adequately protected from fire to ensure that persons will not be immediately threatened by the fire. Such areas should be available on all storey levels to facilitate horizontal evacuation away from the area where the fire has started. Protection from fire can be provided by appropriate structural fire protection provisions (see Chapter 5) and by additional fire resisting construction, including suitably located fire doors, for the purpose of protecting escape routes.

Places of relative safety include:

- an adjacent fire compartment on the same storey as the fire,

- a protected stairway,
- a lobby to a protected stairway, or
- a storey below the storey where the fire is located.

The degree of safety offered by such places will depend on their position relative to the fire incident, but this situation must be constantly monitored during an emergency.

Ultimately, a place of safety is a place outside the building, where a person is not in any danger from the fire. A fire may develop to the stage where it may be necessary to evacuate some or all of the residents from the building. The extent of the evacuation required will depend on the nature and extent of the particular fire incident and on pre-determined procedures.

Evacuation decisions should be based on a strategy which is determined for every nursing home. Further guidance on fire safety management, including how to deal effectively with evacuation, is contained in Chapter 3 of this Guide.

4.1 Principles of Escape Route Design

Means of escape are provided to facilitate evacuation in the event of an outbreak of fire. In examining the means of escape, it is necessary to consider the evacuation process. Evacuation of nursing homes can be sub-divided into distinct phases, as follows:

- Phase 1: Evacuation from the room/area of origin of the fire;
- Phase 2: Evacuation to a place of relative safety;
- Phase 3: Evacuation of parts of building; and
- Phase 4: Total evacuation of building.

Phases 1 and 2 involve horizontal movement away from the immediate danger of the fire and limited vertical movement. Phases 3 and 4 involve horizontal movement, and vertical movement in the case of upper storeys. Vertical movement will be by way of protected stairways from upper floors, to a place of safety outside the building. In limited circumstances (see 4.3.8), evacuation from the building may be by way of an

external escape stairway. In the case of single storey buildings, evacuation from the building will be by way of storey exits directly to the open air.

4.1.1 Number of escape routes

Where possible, a choice of escape routes should be available. Alternative escape routes are provided to allow, in as far as is practicable, escape in a direction away from the fire location. Each storey of the building should be provided with alternative escape routes. This is based on the possibility that in the event of an outbreak of fire, one of the escape routes may become unavailable for use. Escape routes from a storey should be remote from each other, to provide alternative routes.

In addition to a minimum of two alternative escape routes required from every storey, the floor layout with respect to the travel distance criteria (see 4.2.2) will also influence the number of escape routes required for any situation. Alternative escape routes may not be possible from all rooms or areas in a storey. The limitations on travel distance will depend on whether escape is possible in one direction or in more than one direction. The number of escape routes will also be influenced by the capacity of those routes to evacuate each area, taking into account the possibility of an escape route being unavailable for use as a result of the fire.

In certain very limited circumstances, one escape route may be adequate from a storey. This is acceptable only where there is little likelihood of this route being unavailable for use and an alternative escape route cannot readily be provided (see 4.3.4).

4.1.2 Sub-Division of Storeys

Each storey should be divided into a minimum of two fire compartments (see Chapter 5) to facilitate horizontal evacuation to a place of relative safety in an adjoining fire compartment (see *Diagram 1*).

In the case of a small building served by a single escape stairs (see 4.3.4), horizontal evacuation to an adjoining

compartment will not be possible and in these situations a suitable refuge area adjoining or within the escape stairway should be provided to facilitate evacuation downwards.

4.1.3 Width of Escape Routes

Escape routes should be sufficiently wide to enable evacuation of the building, taking into account the physical condition of residents and the evacuation methods likely to be employed (see Chapter 3). Minimum widths for escape routes are indicated in 4.2.4.4 and 4.3.3.

4.1.4 Means of Escape: General Requirements

4.1.4.1 General provisions relating to escape routes are indicated in 4.4.

4.1.4.2 Fire detection and alarm systems (see 4.5) are required to give early warning in the event of an outbreak of fire to facilitate an early and effective staff response.

4.1.4.3 Emergency lighting (see 4.6) is required to ensure that there is sufficient lighting in the event of full or partial failure of the power supplies to the normal lighting systems.

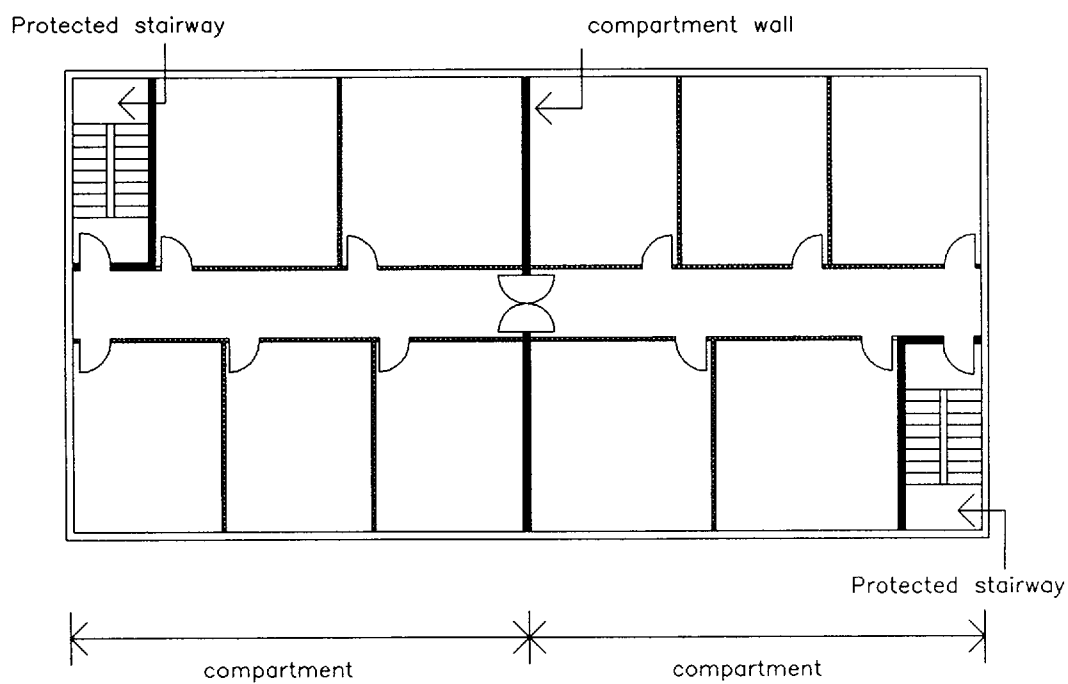
4.1.5 Components of Escape Routes

The means of escape provisions in nursing homes consist of the following components:

- horizontal escape routes (see section 4.2); and
- vertical escape routes (see section 4.3).

In single storey buildings, the means of escape will consist of horizontal escape routes only while multi-storey buildings will require a combination of these two components.

Diagram 1
Storey sub-division



KEY		60 minutes fire resisting construction
		30 minutes fire resisting construction
		fire door FD 30 S
		fire door FD 60 S

Notes

- (1) See 4.2.2. for travel distance limitations
- (2) See 4.2.4. for escape corridor provisions
- (3) See 4.3.2. for number and location of escape stairways
- (4) See chapter 5 in relation to fire doors and structural fire precautions

4.2 Horizontal Escape Routes

4.2.1 Components of Horizontal Escape

The horizontal escape routes in nursing homes may also be considered in two stages, as follows:

- travel within rooms; and
- horizontal travel from rooms to a place of relative safety or to a final exit.

4.2.2 Travel Distance

For the purposes of means of escape, the travel distances along an escape route from any point in a building should be restricted to an extent which is dependent on the availability of alternative escape routes. For this purpose, a distinction is made between:

- travel from any point from which escape can be made in one direction only (sometimes referred to as dead-end travel); and
- travel from any point from which escape can be made in more than one direction, by way of alternative escape routes.

The limitations on travel distance depend on whether travel is available in one direction only or in more than one direction. The former is more restrictive, due to the increased risk of a single escape route becoming unusable in a fire. Travel distances from all parts of a nursing home should generally be within the maximum values indicated in Table 4.1 below.

TABLE 4.1

Limitations on travel distance	
Available escape routes	Maximum travel distance (metres)
In one direction only	10
In more than one direction	20

Diagram 2 illustrates the limitations on travel distance for escape in one direction only and in more than one direction for a typical corridor arrangement.

Travel distance from any point is measured along the escape route to the nearest:

- (a) final exit;
- (b) door to a protected escape stairway;
- (c) door to an external escape stairway, where permitted (see 4.3.8); or
- (d) where escape is possible in more than one direction, to a door into an adjacent fire compartment on the same storey, where that compartment has an independent alternative escape route. The alternative escape route may be by way of a third compartment provided that compartment contains a storey exit as at (a), (b) or (c) above (see Diagram 3).

An escape route may consist of travel which is initially in one direction only, for example from a room to a door on a corridor, from which point escape may be possible in more than one direction. In this case, the dead-end section should not exceed 10 m and the total travel distance should be limited to 20 m. Alternatively the total travel may be in one direction only and is therefore limited to 10 m.

The maximum travel distances indicated in Table 4.1 should be regarded as guidelines, rather than strict limits. However, any departure from the tabulated values should be on the basis of professional judgement, taking into account the existence of any compensating fire safety measures.

4.2.3 Escape from a room

Alternative escape routes are required from a room in the following situations:

- (i) from any bedroom which is occupied by more than 6 persons; or

- (ii) from any other habitable room which is occupied by more than 20 persons; or
- (iii) from any room where the travel distance within the room (travel in one direction only) exceeds 10 m.

Bedrooms should not be inner rooms, ie. it should not be necessary to pass through another room to reach an escape corridor.

Diagram 4 illustrates the restrictions required for rooms provided with a single means of escape.

Where alternative escape routes from a room lead to the same corridor, they should be separated from each other by means of a self closing fire door across the corridor and should lead to separate storey exits.

The width of an exit from any room which may be occupied by persons having walking aids or using wheelchairs should be such as to permit the adoption of the planned evacuation procedure and should normally be not less than 900 mm. Where it is likely that persons will require bed or mattress evacuation, door widths should be adequate for such movement out of the room.

4.2.4 Escape Corridors

4.2.4.1 Corridors which form part of an escape route should be constructed in 30 minutes fire-resisting construction. Corridor walls should extend to the underside of the roof or floor above or, where there is a fire-resisting ceiling, be provided with cavity barriers above the walls on the line of the corridor. Doors onto escape corridors (except a door from a toilet containing no fire risk, provided the toilet is separated from the remainder of the building by fire resisting construction) should be fire resisting (see Chapter 5).

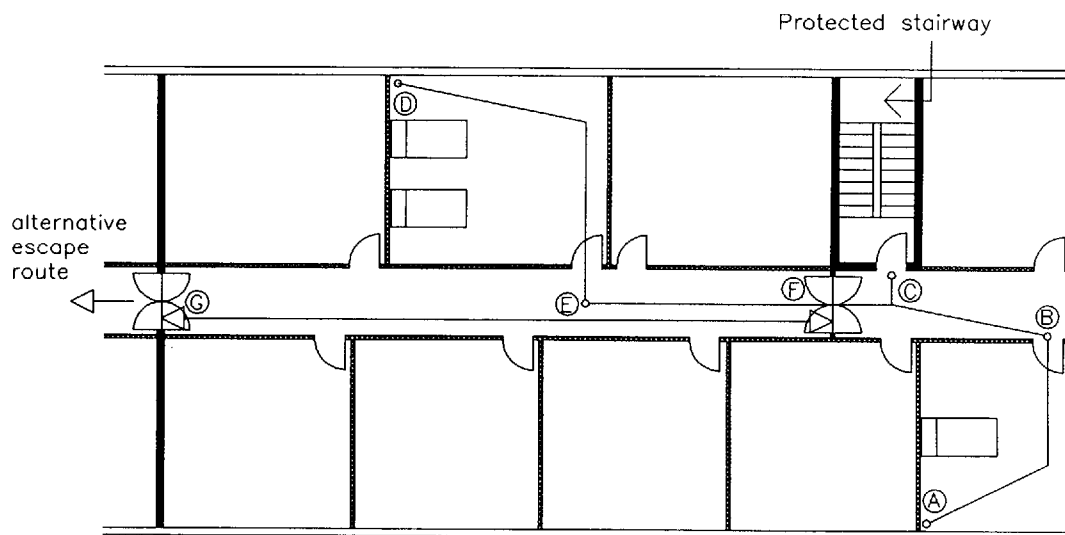
4.2.4.2 Escape corridors should be effectively sub-divided by fire doors (see Chapter 5) between storey exits so as to restrict the spread of smoke along their length. Corridors

should be sub-divided so that no undivided corridor section exceeds 15 m (see *Diagram 2*).

4.2.4.3 Dead-end corridors are corridors where escape is possible in only one direction (see 4.2.2). In the event of fire, dead-end corridors increase the danger of persons being unable to escape. The length of dead-end corridor is restricted to the difference between the total travel in one direction only (10 m) and the travel within the room. Except in a building permitted to be served by a single escape stairway (see 4.3.4), dead-end corridors which lead to a protected escape stairway should be arranged so as to allow access to an alternative storey exit, without having to pass through the stairway enclosure. The dead-end part of the corridor should be separated from the remaining section by fire doors, at a position which ensures that the door to the stairs enclosure is within the dead-end section (see *Diagram 5*).

4.2.4.4 The width of escape corridors should generally be not less than 1150 mm. A lesser width may be acceptable, provided that any door which sub-divides its length is not less than 900 mm, and there is adequate width for the purpose of evacuation.

Diagram 2
Travel distance



Travel distance

A to B to C : 10m maximum

D to E : 10m maximum

D to E to F to C : 20m maximum

Corridor sub-division (see 4.2.4.2)

G to F : 15m maximum

KEY  60 minutes fire resisting construction

 30 minutes fire resisting construction

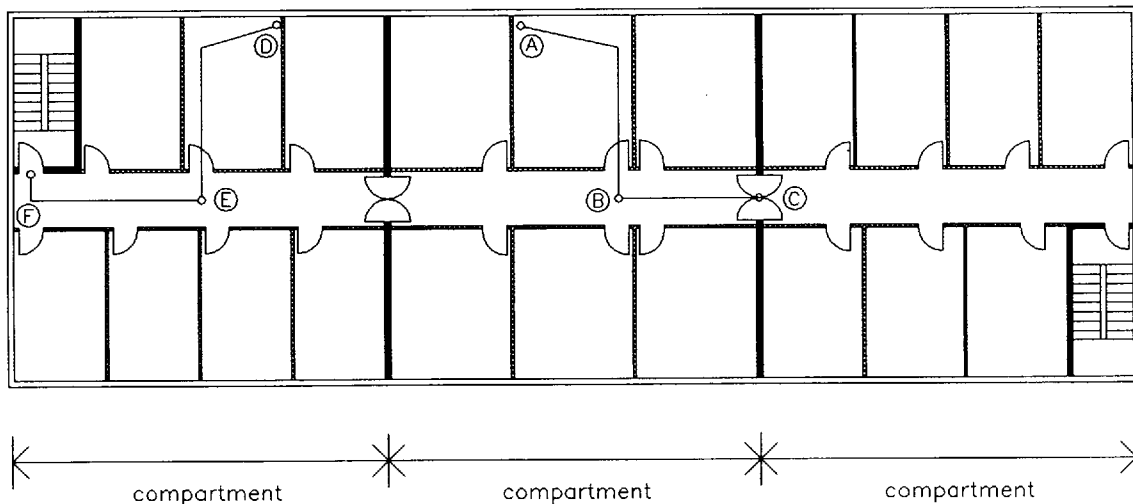
 fire door FD 30 S

 fire door FD 60 S

Notes

- (1) See 4.2.2. and Table 4.1 on travel distance limitations
- (2) See 4.2.4. for escape corridor provisions
- (3) See 4.3.2. for number and location of escape stairways
- (4) See chapter 5 in relation to fire doors and structural fire precautions

Diagram 3
Escape to an adjoining compartment



KEY

- 60 minutes fire resisting construction
- 30 minutes fire resisting construction
- fire door FD 30 S
- fire door FD 60 S

Travel distance

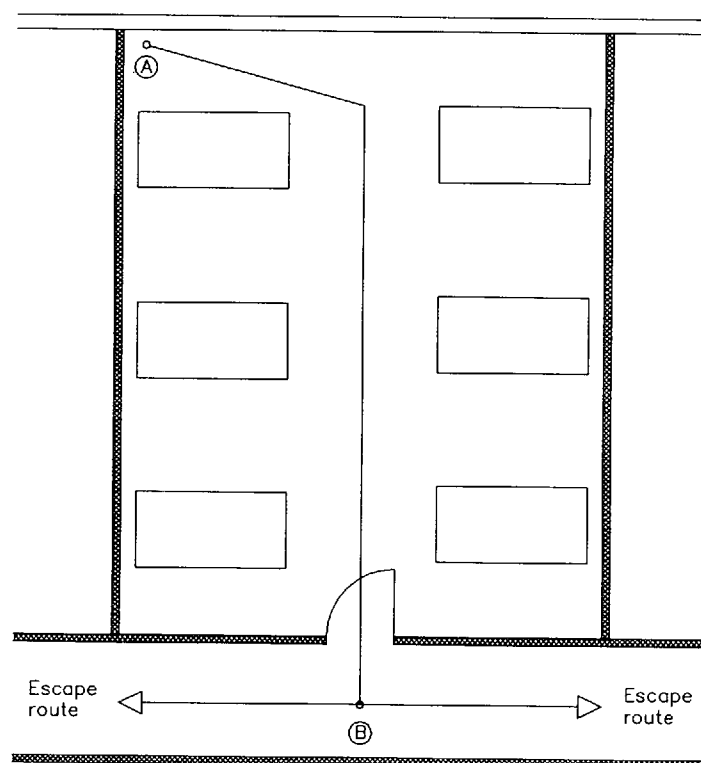
From A to B to C : 20m maximum

From D to E to F : 20m maximum

Notes

- (1) See 4.2.2. and Table 4.1 for travel distance limitations
- (2) See 4.2.4. for escape corridor provisions
- (3) See 4.3.2. for number and location of escape stairways
- (4) See chapter 5 in relation to fire doors and structural fire precautions

Diagram 4
Escape from a room



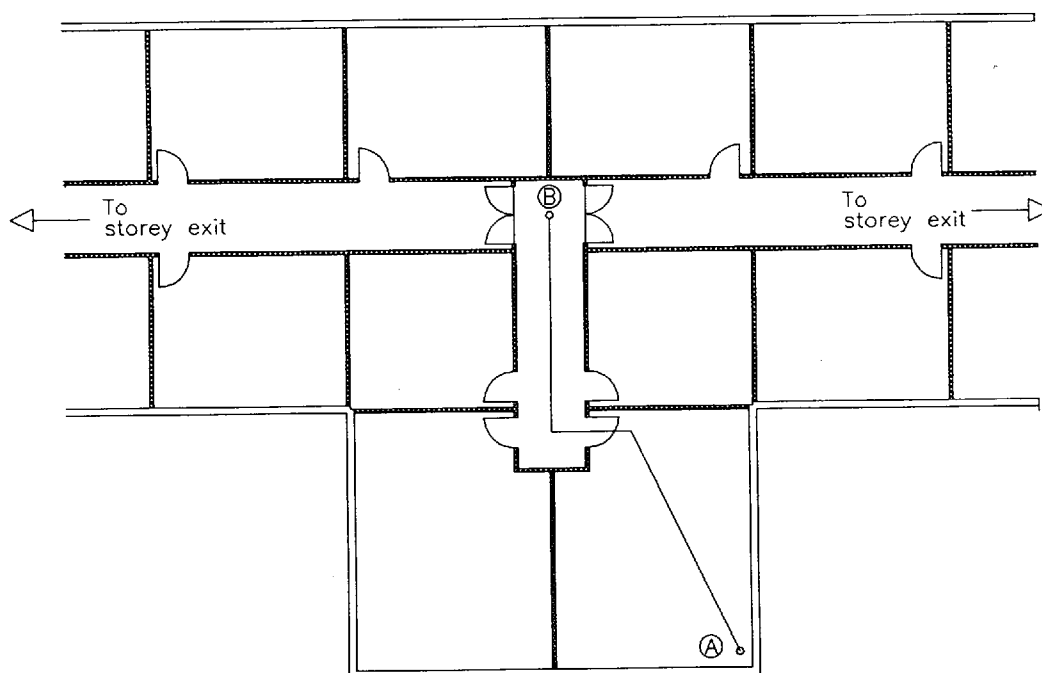
KEY  30 minutes fire resisting construction

 fire door FD 30 S

Notes

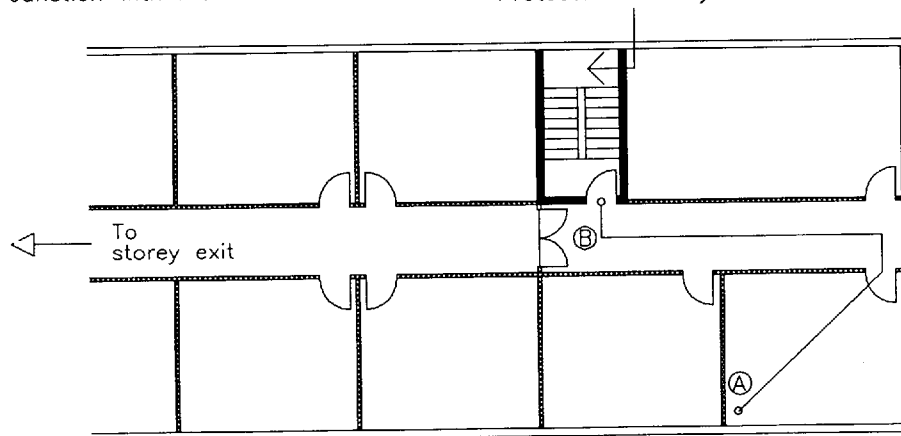
- (1) Maximum travel distance from A to B is 10m
- (2) Maximum number of persons occupying a bedroom should not exceed 6
- (3) Maximum number of occupants in any other habitable room should not exceed 20
- (4) See 4.2.4. for escape corridor provisions
- (5) See 4.3.2. for number and location of escape stairways
- (6) See chapter 5 in relation to fire doors and structural fire precautions

Diagram 5
Dead end corridors



(a) Junction with main corridor

Protected stairway



(b) Continuation past protected stairway

KEY

 60 minutes fire resisting construction

 30 minutes fire resisting construction



fire door FD 30 S



fire door FD 30 S

Travel distance from A to B : 10m maximum

4.3 Vertical Escape Routes

Vertical escape routes are those parts of the escape routes which lead from the upper storeys of the building to a place of safety in the open air at ground floor. They enable persons to evacuate the building from upper storeys or to evacuate to a place of relative safety on a lower storey level.

Vertical escape routes should be by way of stairways which are protected from fire by means of fire resisting construction. The protection is provided to the enclosure to the stairway at all storeys and by the provision of protected lobbies, where required, between the stairs enclosure and the accommodation.

In general, due to the likely health condition of the residents, external escape stairs are not acceptable in nursing homes. However, in some limited situations (see 4.3.8) this may be the only practicable way of providing an alternative means of escape from a building.

4.3.1 Protection of vertical escape routes

The protection of vertical escape routes by enclosing stairways in fire resisting construction is essential, to prevent ingress of smoke which would render these unusable for escape. Protection of stairways also restricts the spread of fire between the storeys of a building. Guidance on fire resisting construction is contained in Chapter 5 of this Guide.

To restrict smoke entering a protected stairway, doors opening into it must be self-closing fire doors (see Chapter 5). In some situations it will also be necessary to provide a protected lobby between the stairs enclosure and the accommodation. The performance of fire doors (see 5.9) in protecting the vertical escape routes is a critical element in the fire safety provisions of a nursing home.

In general, doors from rooms should not open directly into escape stairways. Rooms should connect to the escape stairways only by way of protected corridors or protected lobbies. However, a toilet or bathroom which is a low fire risk and is separated from other rooms by fire-resisting construction may connect directly to the stairs enclosure.

Circulation routes on a storey should be excluded where possible from escape stairways. Escape stairways should lead directly to a place of safety in the open air at ground floor level.

Where a stairway is the only protected escape stairway in a building, it should not extend down to any basement storey. Where there is more than one protected stairway in a building, at least one should terminate at ground floor level. Where an escape stairway extends to a basement or lower-ground floor storey, it should be separated from any accommodation at the lower level by fire resisting lobbies and the section between the ground and basement or lower-ground floor storeys should be separated from that serving the upper stories by fire resisting construction.

Escape stairways should have windows openable to the open air, to allow for ventilation of smoke which may enter it from the accommodation. Stairways which are not provided with openable windows should have an appropriate smoke ventilation facility, with a suitable means of opening, provided at the top of the stairway enclosure.

No storage of any kind should be provided in escape stairways. This includes hot presses and storage cupboards which present a high fire risk. There are also restrictions on the location of some building services in escape stairways (see Chapter 6).

4.3.2 Number and location of escape stairways

There should be a minimum of two independent escape routes from every storey (4.1.1), except in very limited circumstances (4.3.4).

The number of escape stairways should be adequate to safely evacuate the building, if required, on the basis of any one stairway being unavailable for use on account of a fire. Escape stairways should be located so as to provide alternative escape routes and to reduce to a minimum the dead-end travel (4.2.2).

The number and location of escape stairways required will

also be determined by the restrictions in travel distance indicated in Table 4.1.

4.3.3 Width of stairways

The width of escape stairways will depend largely on the method which is likely to be used for evacuation purposes (see Chapter 3). Escape stairways should preferably be 1150 mm, but generally not less than 900 mm, in width.

Where it is considered that it will be necessary to evacuate persons in beds or on mattresses, the stairways and associated landings should be of adequate width and depth to facilitate movement downwards.

The adequacy of all escape routes, including stairways, door openings and escape corridors should be checked against the method of evacuation likely to be used. Where chair lifts are provided on stairways, these should not obstruct the means of escape in an emergency.

4.3.4 Small premises with single escape stairway

In some small premises it may not be practicable to provide an alternative protected escape stairway. However, it may be possible to provide an alternative escape route by way of an external escape stairway (see 4.3.8).

Where it is not practicable to provide a second protected escape stairway or an external escape stairway, a single protected stairway may be adequate where all of the following conditions are met:

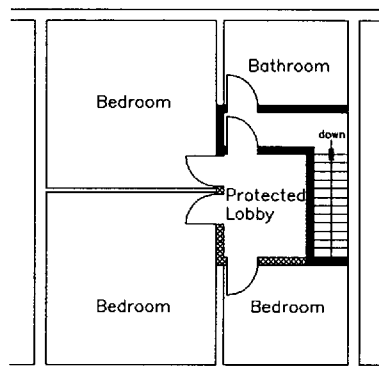
- (a) the building does not have more than three storeys above ground level;
- (b) non-ambulant persons, or any persons who are dependant on the assistance of staff for evacuation, are not accommodated above the ground floor storey;
- (c) all accommodation is separated from the stairway enclosure by means of protected lobbies or protected corridors. Toilet/bathroom accommodation which does not contain a fire risk and is separated from other

accommodation by fire resisting construction may connect directly to the stairs enclosure;

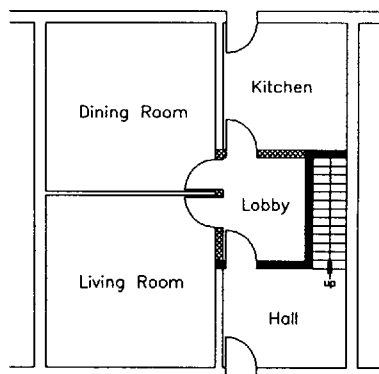
- (d) the stairway enclosure is provided with a final exit at ground floor level;
- (e) the floor area of any storey above the ground does not exceed 150 m² and not more than 12 persons are accommodated above the ground floor storey;
- (f) all habitable rooms have openable windows (minimum opening size of 850 mm high x 500 mm wide, with the bottom of the opening not more than 1000 mm above the floor level of the room) which are accessible for the purpose of rescue, if required;
- (g) travel distances to the stairs enclosure are within the limits for escape in one direction only, indicated in Table 4.1;
- (h) no storage of any kind is provided within the stairs enclosure or in protected lobbies; and
- (j) the stairway is protected by means of fire resisting construction (with self-closing fire doors) and the stairway does not connect the ground storey with any basement storey (4.3.6).
- (k) a suitable refuge area within or adjacent to the stairs enclosure is provided on all storeys to facilitate evacuation.

Diagram 6 illustrates a typical arrangement at ground and an upper storey in a small premises with a single escape stairway.

Diagram 6
Small premises with a single stairway



First Floor Plan



Ground Floor Plan

KEY		60 minutes fire resisting construction
		30 minutes fire resisting construction
		fire door FD 30 S

Notes

- (1) Conditions which apply to the premises served by a single escape stairway are outlined in paragraph 4.3.4.
- (2) See chapter 5 in relation to fire doors and structural fire precautions

4.3.5 Accommodation stairways

Accommodation stairways are stairways that connect storeys but are not suitable as escape stairways. Accommodation stairways should be enclosed at all storey levels in fire resisting construction, with self-closing fire doors (see Chapter 5). Doors to accommodation stairways should not be held in the open position, except by means of magnetic devices connected to the fire alarm system (see 4.5).

4.3.6 Stairways to basements and lower-ground floor storeys

Generally, a basement, other than one of very limited area, requires a minimum of two escape stairways to a place of safety at ground floor level. In the case of lower-ground floor storeys, it may be possible to provide one or more exits directly to the open air. Stairways serving upper storeys which extend down to basement or lower-ground floor level present an increased risk of fire spread by way of the stairway. Additional protection by way of protected lobbies between such stairways and the accommodation, is required at the ground and basement or lower-ground stories. Where a stairway is the only protected stairway serving a building, it should not continue down to any basement or lower-ground storey.

4.3.7 Escape Stairways: General provisions

An internal stairway may be acceptable as an escape stairway where:

- the width of the stairway and dimensions of steps are adequate for the purposes of means of escape, taking into account the methods of evacuation that will be required in the event of fire (4.3.3);
- the stairway is of sound construction and is capable of affording safe passage for the users of the building;
- the stairway is a protected stairway and leads directly to a place of safety at ground floor level (see 4.3.1);
- the pitch of the stairway does not exceed 38° and is constant throughout its length;
- the number of treads in a flight is not more than 16 nor less than 3;

- continuous handrails, which provide firm support, are provided on both sides of stairway and on landings. The top of the handrail should be between 840 mm and 1000 mm vertically above the pitch line of the flight and landings;
- storage of any kind is not provided within the stairway enclosure; and
- the stairway is not a spiral stairway.

4.3.8 External escape stairways

An external escape stairway is acceptable as an alternative means of escape in the following limited situation only:

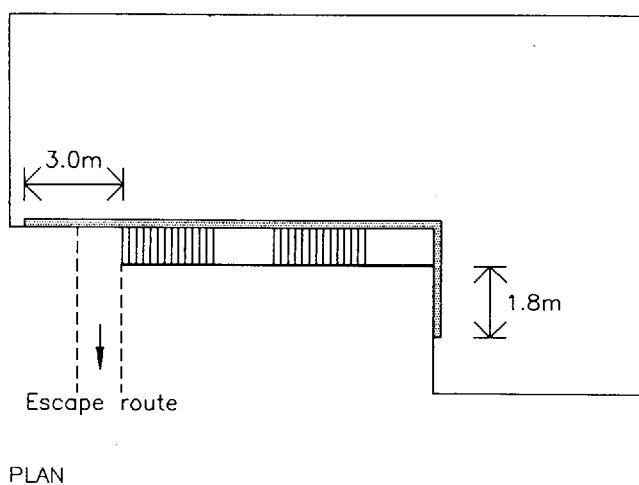
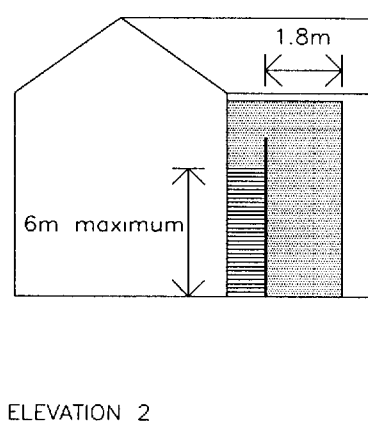
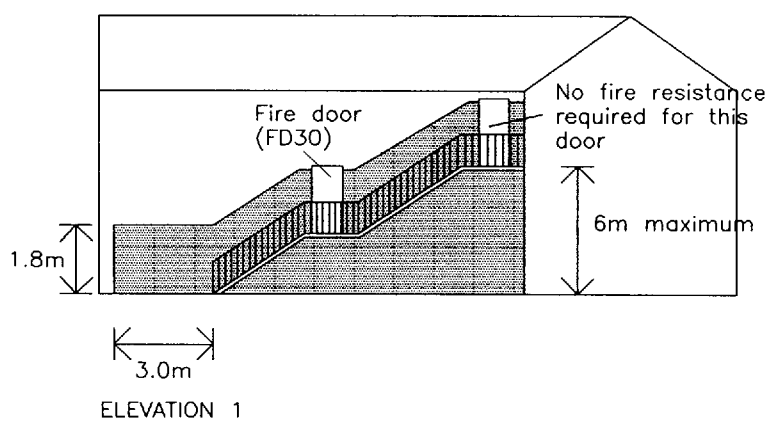
- (a) the building, including any basement or lower-ground storey, does not have more than three storeys; and
- (b) a suitable alternative internal protected escape stairway cannot be practicably provided.

New external escape stairways must comply with Part K of the Building Regulations, 1991. Guidance as to how to comply with Part K of the Building Regulations is contained in Technical Guidance Document K, Stairways, Ramps and Guards.

External stairways should also comply with the following conditions (see *Diagram 7*):

- (i) all doors affording access to the stairway should be fire resisting, unless it is located at the head of the stairway, leading downwards;
- (ii) any part of the external walls within 1.8 m of, and vertically below, the flights and landings of a stairway leading downwards should be of fire-resisting (minimum 30 minutes) construction; and
- (iii) protection should be provided, by means of fire resisting construction, for any part of the building (including doors) within 3 m of the escape route from the foot of the stairway to a place of safety.

Diagram 7
External escape stairway



Zone of fire resisting construction

4.3.9 Lifts

A lift which is designed for normal use is not suitable for the purpose of means of escape in the event of fire. Where practicable, those persons who are unable to use stairways, should be accommodated on the ground floor storey. For seriously incapacitated residents, it may be necessary to provide a lift which is suitably designed for emergency use. Satisfactory arrangements must be made to ensure continuity of power supplies to such a lift. Other arrangements may also be necessary to ensure that proper safeguards and procedural arrangements have been incorporated in the means of escape scheme.

Lifts should be contained within an enclosure with fire resisting construction (see Chapter 5). A protected lobby should be provided between lift doors and corridors. Where a lift is contained within a stairway enclosure, it should do so for its full travel and should not communicate directly with accommodation at any storey level.

Lift machine rooms should be separated from the lift enclosure with fire resisting construction and any openings for the operation of the lift should be as small as possible. Lift motor rooms should not be used to provide storage or other use and should be provided with automatic smoke detection (see 4.5).

4.4 Escape Routes: General Provisions

4.4.1 Floor surfaces on escape routes

The floors of corridors, lobbies, landings and stairways forming parts of escape routes should have non-slip even surfaces. Where it is necessary to provide ramps for use by physically handicapped persons, they should comply with Technical Guidance Document M to the Building Regulations, 1991.

4.4.2 Height of escape routes

Escape routes should have a minimum clear headroom of 2.0 m from floor to ceiling and should have no obstructions or projections, except any door frame, below this height.

4.4.3 Doors on escape routes

All doors on escape routes should generally open in the direction of escape. Doors should not open across stairways, or obstruct the width required for escape of corridors, landings, or lobbies when open. However, doors serving rooms may open into the accommodation.

A fire-resisting vision panel should be provided in fire doors which are located on corridors.

4.4.4 Door Fastenings

Exit doors should be readily openable at all times. However, in some cases there may be an over-riding need to protect some patients, due to their state of health, by restricting the use of final exit doors to staff members. In such circumstances each member of staff should carry a master key for any locking devices, and a suitable key should also be provided in a break-glass box adjacent to the door.

4.5 Fire Detection and Alarm Systems

The provision of an appropriate fire detection and alarm system is an essential element of the fire safety measures in nursing homes. It provides early warning of the occurrence of fire and thereby facilitates the activation of appropriate emergency procedures, including evacuation. Early detection also improves the chances of restricting the growth and spread of fire within the building by the use of first-aid fire-fighting equipment, where safe to do so, and by early call-out of the fire services.

A fire detection and alarm system should be provided in all nursing homes. It should meet the requirements for an LI type system complying with Irish Standard I.S. 3218:1989. The system should incorporate automatic fire detection (heat or smoke type detectors, as appropriate) throughout the premises and suitably located manual activation facilities. An LI type fire detection and alarm system requires automatic detection in escape routes, all rooms and other fire risk areas. Consideration may also be given to the design of a two-stage system which initially alerts staff, who will respond in a pre-determined manner, on activation of the system.

Special attention may also be required for the type and disposition of sounding devices, having regard to the particular circumstances.

The building should be divided into fire alarm zones, as required by the standard, which will facilitate identification of the fire source. Some installations, particularly in larger premises, may be of a type (ie "addressable" or "intelligent") which will identify the precise location of the first detector or manual call point to be activated. Control and indicating equipment should be located in positions where there is maximum supervision. A procedure should be developed to ensure that the panel is attended immediately the alarm is raised. The fire warning system should be designed to be an integral part of the evacuation strategy and to minimise distress and disturbance of occupants and staff.

The fire alarm system may be required to actuate other fire protection systems in a building, such as the closure of fire doors which are held open by magnetic devices. The automatic closure of such fire doors within pre-determined fire zones is an essential fire safety requirement. Facilities should be provided at the control equipment to both automatically and manually release fire doors. Fire doors enclosing stairways, should not generally be held open.

It is essential that reliable means are established for ensuring that, when an alarm of fire occurs, the fire brigade is called with the minimum of delay. This will normally be done by telephone by a designated staff member. Consideration should also be given to the provision of a suitably designed monitoring facility for this purpose on the fire detection and alarm system.

The fire detection and alarm system should be designed, installed and maintained in accordance with the requirements of I.S. 3218 and certification to that effect should be kept on the fire safety register (see Chapter 3). Management and staff should be familiarised with the mode of operation of the fire detection and alarm system and of the user responsibilities in relation to periodic inspection, testing and maintenance, as outlined in the standard. On completion of

any new or modified system, a commissioning certificate in the form specified in the standard should be obtained. Existing systems may require to be examined to determine the extent of compliance with the recommendations of this Guide and remedial work undertaken where necessary.

4.6 Emergency Lighting

In the event of failure of the electrical supply to the normal lighting, emergency lighting is necessary in a nursing home to provide sufficient lighting to:

- indicate clearly and unambiguously the escape routes within the building and along external escape routes where necessary;
- provide illumination along escape routes to allow safe movement towards and through exits;
- ensure that fire alarm call points and fire fighting equipment provided along escape routes can be readily located;
- assist fire and emergency services in rescue, evacuation and fire fighting operations.

Emergency lighting should be provided in all nursing homes in accordance with the recommendations of Irish Standard I.S.3217:1989.

Emergency lighting is normally provided by means of suitably located self-contained lighting units. The emergency power supply (constantly charged batteries) is contained within self-contained units. Other systems may be based on a centrally located emergency supply source. Careful attention should be given to the siting of emergency lighting units, to provide for the required level of illuminance and to indicate changes in direction and in level along escape routes.

There are different modes of operation for emergency lighting systems. "Maintained" and "combined" or "sustained" systems are illuminated at all material times (ie. when the building is occupied), while a "non-maintained" system is only illuminated on failure of the normal power supplies. Generally within a nursing home, a combination of both these

types will be provided, with the emergency lighting on the common escape routes (escape corridors, stairways, etc.) being illuminated at all material times.

The duration of the emergency lighting system should be three hours, minimum. The levels of illuminance provided by the system should take into account the physical and mental condition of the occupants and, in general, these should exceed the minimum values specified in I.S. 3217: 1989.

The emergency lighting system should be designed, installed and maintained in accordance with the requirements of I.S. 3217: 1989. Management and staff should be familiar with the mode of operation of the emergency lighting system and of the user responsibilities in relation to periodic inspection, testing and maintenance, as outlined in the standard.

A commissioning certificate, in the form specified in that standard, should be obtained on completion of any new or modified system. Existing systems may require to be examined to determine the extent of compliance with the recommendations of this guide and remedial work undertaken where necessary.

Chapter 5

Structural Fire Precautions

5.0 General

Structural fire precautions are required to prevent premature structural failure and to limit fire spread within the building. Structural fire precautions are also necessary to protect the means of escape (see Chapter 4). For these purposes, the following provisions are necessary:

- sub-division of the building into a number of fire compartments (5.1);
- elements of structure (5.2) to be provided with appropriate fire resistance (5.4);
- compartmentation of high fire risk areas (5.5);
- restrictions to linings of walls and ceilings so as to limit their contribution to the development of fire and to have adequate resistance to the spread of fire along their surfaces (5.8);
- the provision of fire doors to limit the spread of fire and smoke (5.9);
- limitation of fire spread at junctions between building components, service penetrations and in cavities (5.7, 5.10, 5.11).

5.1 Compartmentation

The spread of fire within a building can be restricted by sub-dividing it into fire compartments, separated from one another by walls and/or floors of fire resisting construction. The object of such compartmentation is to prevent the rapid spread of fire and to reduce the chance of fires becoming large. Walls common to two buildings require special consideration to reduce the chance of fire spread between buildings.

Every compartment floor and compartment wall should form a complete barrier to fire between the compartments they separate and should have the appropriate fire resistance. Compartment walls that are common to two or more buildings should run the full height of the building in a continuous vertical plane and should be completely imperforate.

In nursing homes, all floors should be compartment floors, so that each storey forms one or more fire compartments. Any high risk areas (5.5) should also be compartmented by means of fire resisting construction.

Every storey in a nursing home should be sub-divided into at least two fire compartments, to facilitate horizontal evacuation in the event of an outbreak of fire. Where, due to the size of a building, it is not practicable to provide at least two fire compartments on every storey, suitable refuge areas should be provided at every storey where residents can be temporarily placed prior to evacuation downwards (see Chapter 3). Such refuge areas should be adequate for their intended purpose and be protected from fire by means of 30 minutes minimum fire-resisting construction.

5.2 Elements of Structure

The following elements are regarded as elements of structure:

- (a) any member forming part of the structural frame of a building or any other beam or column not being a member forming part of a roof structure only;
- (b) floors not being the lowest floor of a building;
- (c) compartment floors and walls and walls separating buildings;
- (d) a load-bearing wall or load-bearing part of a wall;
- (e) any structure enclosing a protected shaft or stairway.

5.3 Fire Resistance

The fire resistance of an element of structure is a measure of the ability of that element to withstand the effects of fire for a specified duration, when it is tested to a particular standard. The standard test methods normally employed are those contained in British Standard BS 476: Parts 20 – 24.

The recommendations for fire resistance are intended to provide the structural elements with resistance to exposure to fire, for reasonable periods. The element of structure should either be:

- (a) constructed to the same specification as that which, if exposed to test by fire in accordance with BS 476 Parts 20 – 24, would fulfil its function in relation to loadbearing capacity, integrity and insulation for not less than the required duration, or
- (b) conform with one of the specifications set out in the Building Research Establishment Report "Guidelines for the construction of fire-resisting structural elements" for the required periods of fire resistance.

The fire resistance of a door is a measure of its ability to withstand the effects of fire under specified test conditions, for a specified duration. The standard test methods normally employed are those contained in British Standard BS 476: Parts 20 – 24.

Elements of construction should not generally be treated in isolation. The interaction of one element on another should not lessen the fire resistance for the composite construction. The junction of elements, such as walls and ceilings, may present points of weakness and care should be taken to ensure the integrity of such areas in fire conditions.

Guidance on increasing the fire resistance of existing timber floors is given in Building Research Establishment Digest Number 208.

Guidance on methods to increase the fire resistance of existing timber doors is available from the Timber Research and Development Association.

5.4 Fire Resistance for Elements of Structure

Recommendations for the fire resistance of the elements of structure in a building used as a nursing home are contained in Table 5.1 below.

Table 5.1

Location of Element	Fire Resistance
Compartment Floor; Compartment Wall	60
Enclosure to Protected Stairway or Protected Shaft	60
Enclosure of High Fire Risk Area (Boiler Room, Laundry Room, Storage Area, Kitchen, Refuse Area)	60
Enclosure to lift and Lift Motor	60
Enclosure to Protected Lobby	30
Enclosure to refuge area	30
Enclosure to Escape Corridor	30
Walls between Bedrooms	30

Note: Fire resistance are minimum values and relate to performance, expressed in minutes, in terms of loadbearing capacity, integrity and insulation by reference to BS 476: Parts 20 – 24.

5.5 High Fire Risk Areas

Areas which present a high fire risk should be compartmented by means of construction having a minimum fire resistance of 60 minutes. Examples of such areas include kitchens, laundry rooms and electrical switch rooms. Doors into such areas, except where they open directly to the outside, should have a fire resistance of 60 minutes, be fitted with self closing devices and should not be held permanently open. A heating boiler should preferably be located in a separate outside building, but if it is within the building it should open directly to the outside and should not communicate with other accommodation. The compartmentation of any such boiler rooms should be by means of solid non-combustible construction.

Small store rooms, including linen presses, should be separated by means of 30 minutes minimum fire resisting construction, with 30 minutes self-closing fire doors.

All high fire risk areas should be fitted with automatic fire detection, connected to a fire alarm system for the building (4.5).

5.6 Construction Between Bedrooms

If a fire occurs in a bedroom it is important that spread to adjoining rooms is restricted to allow sufficient time for evacuation of residents. Walls separating bedrooms should have a fire resistance of not less than 30 minutes.

5.7 Construction Details

Junctions between elements of construction, cavities, pipe-ducts and lifts frequently constitute points of weakness for fire spread and should be checked carefully in existing buildings. Junctions between building components should not be such as to transfer fire from one side to the other. Suitable firestopping should be provided in these areas.

Cavities and hidden spaces, such as hollow walls and suspended ceilings, can provide a route for fire spread between rooms and throughout buildings. Cavity barriers should be provided to restrict the spread of smoke and fire within cavities. Large cavities may also need to be protected by automatic fire detection.

The provision of cavity barriers and fire-stopping should generally comply with the recommendations contained in section 3.4 of Technical Guidance Document B, to the Building Regulations, 1991.

5.8 Wall and Ceiling Finishes

It is necessary that wall and ceiling linings should have adequate resistance to spread of flame over their surfaces and do not contribute to the development of a fire. The surface of walls and ceilings should comply with the classifications indicated in Table 5.2, for the different locations.

Surface spread of flame may be tested by reference to the method specified in BS 476: Part 7, under which a material may be classified as Class 1,2 or 3, Class 1 being the highest rating.

To restrict to a minimum the use of materials which ignite easily or which produce a high rate of heat release when

ignited, "fire-propagation" indices are specified, by reference to the method of test specified in BS 476: Part 6. Index of performance (I) relates to the overall test performance, whereas sub-index (i) is derived from the first three minutes of the test.

The highest product performance classification, based on the above criteria, is Class 0. This is achieved if a material or the surface together with it's substrate of a composite product is either:

- (a) composed throughout of materials of limited combustibility (see Appendix D) or
- (b) a class 1 material which has a fire propagation index (I) of not more than 12 and sub-index (i) of not more than 6.

Table 5.2

Location of Wall or Ceiling Linings	Classification
Circulation Spaces, including Protected Corridors, Protected Lobbies and Protected Stairways	Class 0
Habitable Rooms exceeding 30m ² in area	Class 0
Kitchens and other High Risk Areas	Class 0
Bedrooms or Other Habitable Rooms not exceeding 30m ² in area.	Class 1
Fixed or Moveable Screens in Bedrooms	Class 1
Toilets, Bathrooms and other Small Rooms not exceeding 4m ² in area	Class 3

Notes

- 1. Parts of walls in a room may have a lower classification (but not less than Class 3) provided these areas are restricted to half the floor area of the room or 20 m² (divided into 5 m² sections separated from each other by 2 m), whichever is least.
- 2. Toilet areas within a protected stairwell should have a Class 0 rating.

5.9 Fire Doors

Fire doors are provided to restrict the spread of fire and smoke in a building and form an important part in the defence against fire. They are provided in openings to

compartment walls and the enclosures of protected stairways and lifts. They are also provided along and across protected escape routes (see Chapter 4).

The provision of fire doors in nursing homes should be in accordance with Table 5.3 below.

Table 5.3

Type of Fire Door	Location
FD30S	1. A door forming part of the enclosure to a protected stairway, a protected lobby or a protected corridor.
	2. A door forming part of a lift enclosure, unless within the enclosure of a protected stairway.
	3. A door from a bedroom to an escape corridor.
	4. A door sub-dividing a protected corridor.
	5. A door to a small store room (see 5.5).
FD60S	1. A door forming part of an enclosure to a high risk area (store room, kitchen, laundry, boiler room, refuse area, electrical room, etc.).
	2. A door forming an opening in a compartment wall.

Notes:

FD30, FD60 denote fire door assemblies ("door-sets"), for durations 30 and 60 minutes respectively.

Periods of fire resistance relate to performance in terms of integrity by reference to BS 476: Parts 20 and 22.

The suffix "S" denotes an appropriate cold smoke seal between the door and door-frame. These doors should have leakage rates not exceeding 3 m³/m/hour at the heads and jambs.

A fire door includes the door frame and associated ironmongery, such as hinges, locks, catches, seals and door-closures. The complete assembly, often referred to as a fire door-set, constitutes a fire door. The fire resistance of a fire door must be achieved, when it is part of a door-set, in its

location within a building. It is therefore critical that a fire door-set is installed correctly and in accordance with any relevant test certification.

New fire doors should be selected and installed in accordance with the following standards:

- BS 8214 : 1990, Code of Practice for Fire Door Assemblies with NonMetallic Leaves;
- BS: PD 6512: Part 1: 1985, Guide to Fire Doors; and
- BS: PD 6512: Part 3: 1987, Guide to the Fire Performance of Glass.

The upgrading of existing doors to achieve the performance requirements for a fire door may be feasible in some cases. This should only be undertaken in accordance with tested and approved methods, such as the Timber Research and Development Association's Wood Information Sheet: Section 1: Sheet 32, "Fire resisting doors by upgrading" together with the specifications contained in TRADA Wood Information Sheet 11, D5 to D12, "Timber building elements of proven fire resistance".

Fire doors (except to a cupboard or service duct) should be fitted with self closing devices, which are capable of closing the doors from the fully-open position, with any latches fitted. In the case of bedroom doors, the provision of self-closing devices may give rise to difficulties for occupants and staff. Consideration may be given to their omission where:

- the doors are latched and are generally closed; and
- provision is made for a procedure to ensure that, in the event of a fire in a bedroom, the door is closed after evacuation of the occupants.

Self-closing devices may cause particular problems due to the physical incapacity of some occupants. Care should be taken in the selection of these devices to minimise the difficulties for such persons. The closure should be adequate to perform its required function, without undue closing force, taking into account any necessary latching devices. Self-closing devices with a delayed closing action are available for these situations.

Where it is necessary to hold fire resisting doors in the open position (eg. doors across a corridor), this should be only be done by means of electromagnetic type devices linked to an automatic fire detection and alarm system. Any hold open systems should incorporate an automatic release mechanism complying with BS 5839: Part 3. The automatic release mechanism should release the door to close automatically in the event of any one of the following:

- (i) the detection of smoke by a detector on the fire detection and alarm system which is located adjacent to the door;
- (ii) the failure of the mains power supply;
- (iii) the operation of the manual or automatic fire alarm system;
- (iv) the operation of any timing devices installed for that purpose.

Automatic door releases should be provided with a ready means of manual operation from a position at the door.

Fire doors (except where held open by a holdopen device complying with the above) should be marked, at about eye level, with the appropriate fire safety sign to the effect that they should be kept closed when not in use.

Limited amounts of un-insulated fire-resisting glazing may be incorporated into a fire door in the situations indicated in Table 5.4 below,

Table 5.4

Location of Fire Door	Un-Insulated F.R. Glazing
Between sleeping accommodation and a corridor, or lobby	Small (0.05m ² max.) vision panel above 1.1m
Between a protected stairway and a protected lobby or protected corridor	Unlimited above 1.1m

It is important that fire doors as installed in the building are in accordance with the relevant test certificate which demonstrates that they will meet the required performance.

5.10 Cavity Barriers

Hidden voids in the construction of a building provide a ready route for smoke and flame spread. This is particularly so in the case of voids above other spaces in a building, e.g. above a suspended ceiling or in a roof space. As the spread is concealed, it presents a greater danger than would a more obvious weakness in the fabric of the building. Provisions are required to restrict this by interrupting cavities which could form a pathway around a barrier to fire, and sub-dividing extensive cavities. Guidance on the provision of cavity barriers for this purpose are contained in Section 3.3 of Technical Guidance Document B to the Building Regulations, 1991.

Care should be taken to prevent fire spread from a room into an escape corridor, escape stairway or protected lobby, by way of ceiling voids over such areas. Fire spread between rooms by way of ceilings or other concealed spaces should also be restricted. In these situations it is preferable that walls and partitions be constructed up to the underside of the floor above or to the underside of the roof. Large cavities may also need to be protected by automatic fire detection.

5.11 Pipes, Service Ducts and Fire Stopping

Junctions between elements of construction, cavities, pipe-ducts and lifts frequently constitute points of weakness for fire spread. Junctions between building components should not be such as to transfer fire from one side to the other. Suitable firestopping should be provided in these areas.

Pipes, service ducts and other building services which penetrate elements of construction should be properly protected so as not to afford a means of fire spread between different parts of a building. Pipes of non-combustible

material such as cast iron or steel should be firestopped between the pipes and the element. Pipes with a low softening temperature (eg. plastic pipes) should either be enclosed in a fire resisting duct or be provided with a proprietary fire collar or seal at the point of penetration.

Ducts used for the passage of building services should be of fire-resisting construction. Ducts should be adequately fire stopped at each floor level. Ducts containing gas services should be provided with adequate ventilation to the outside of the building and should not also contain electrical services. Ventilation duct-work passing through compartment walls or floors should be provided with suitable automatic fire-resisting dampers at these locations.

Guidance on the provision of fire-stopping is contained in section 3.4 of Technical Guidance Document B, to the Building Regulations, 1991.

5.12 Lifts

Unless a lift is contained in the enclosure to a protected stairway, it should be contained within an enclosure having a fire resistance of not less than 60 minutes (Table 5.1). Lift enclosures should be provided with a permanent ventilation opening to the outside of the building at the top. The lift machine room should be separated from the lift enclosure by fire resisting construction. Any openings necessary for the operation of the lift should be as small as is practicable.

Chapter 6

Building Services

6.0 General

Some building services are potential sources of fire, and equipment associated with them should be installed and maintained in accordance with the relevant standards and codes of practice. The importance of correct installation is emphasized because these services are often concealed above ceilings and in ducts and any fire caused by them is unlikely to be discovered for some time. The building services considered in this chapter are electrical installations and appliances, gas installations and appliances including medical gases, space heating systems and ventilation systems.

6.1 Electrical Installation

The electrical installation comprising wiring, sockets, switches, distribution boards and other equipment should be installed, fitted and maintained in accordance with the Electro-Technical Council of Ireland (ETCI) National Rules for Electrical Installations (ET 101). The completion certificate issued should be kept on the fire safety register.

The electrical installation should be inspected regularly, tested and an appropriate entry made in the fire safety register. Existing installations may need to be upgraded. It is important that all extensions and repairs to the electrical installation are carried out in accordance with the E.T.C.I. National Rules and an appropriate entry made in the fire safety register. Sufficient socket outlets should be provided for all the electrical appliances in use.

6.1.1 Electrical Appliances

Electrical appliances should conform with an appropriate standard in use at the time of manufacture and be installed according to the relevant standards and codes of practice.. All electrical appliances should be inspected and serviced on a regular basis and an appropriate entry made in the fire safety register.

Electrical appliances with flexible cables should be checked regularly for damage and cables should be replaced, not

repaired, if defective. Plugs on flexible cables should be correctly wired, with the flexible cable secured in the cord grip. Broken plugs should be replaced and fuses should be correctly sized to suit the load of the appliance.

Electrical appliances supplied through permanent cables should have an isolator on the supply line. Special care is required in kitchens and laundries where appliances can be significant sources of ignition for combustible materials.

6.2 Natural Gas and Liquid Petroleum Gas (L.P.G.)

It is essential that the gas installation comprising storage tanks, cylinders, pipe lines, flues and other equipment is installed, fitted and maintained in accordance with the appropriate standards and codes of practice. (See Appendix F). The certificate of compliance issued should be kept on the fire safety register. The gas installation should be inspected at regular intervals and an appropriate entry made in the fire safety register. It is important that all extensions and repairs to the gas installation are carried out in accordance with the relevant codes and standards and an appropriate entry made in the fire safety register.

As a general principle, gas installations, including pipework, should not be positioned in escape routes. LPG gas cylinders should be located outside the building in a well ventilated designated secure area away from openings to basements, cellars and drains. Two shut-off safety valves should be installed on the gas supply pipeline to a building, one inside and the other outside the building. These valves should be manually or automatically operated and their location, purpose and mode of operation should be clearly indicated.

6.2.1 Gas Appliances

Gas appliances should conform with an appropriate standard in use at the time of manufacture and be installed according to the relevant standards and codes of practice. They should be inspected and serviced on a regular basis and an

appropriate entry made in the fire safety register. The use of gas appliances in kitchens and laundries requires special care as they can be significant sources of ignition for the combustible materials present.

6.3 Space Heating

Space heating should preferably be by means of a hot water central heating system. Central heating boilers, whether fired by gas, oil or solid fuel, should be separated from the rest of the building by fire resisting construction and access to them should be preferably from outside the building. Fuel supplies to oil and gas burners should be fitted with fusible link operated shut-off valves. Oil and gas storage tanks should be situated at a safe distance from the building in accordance with the relevant standards (See Appendix F)

6.4. Medical Gases

Cylinder use, storage and permanent installations for medical gases where provided should comply with Chapter 8 of Health Technical Memorandum 83 (UK)(See Appendix F)

6.5. Ventilation

Where a ventilation system is provided it should not be capable of spreading fire or smoke within the building and any associated ducting should meet the provisions of Section 5.11 of this document.

Chapter 7

Bedding and Furnishings

7.0 General

The ignitibility and flammability properties of the contents of nursing homes are important in determining the ease with which fire can start, and also its rate of development. The type and quantity of smoke and toxic gases which results from combustion of bedding and furnishings can have a significant bearing on the safety of the occupants of the building. Generally, bedding and furnishings are made of materials which are combustible, and only a degree of safety can be attained by utilizing components based on resistance-to-ignition properties as assessed according to the recommended Standards. In general, fabrics made from cotton, wool, linen, viscose and rayon are safer than fabrics made from polyester, nylon, polypropylene and polyacrylics.

All replacement bedding and furnishings should meet the standards set out in the following sections. The Industrial Research and Standards (Fire Safety) Domestic Furniture Order 1995 (SI 316 of 1995) is also relevant. Children's sleepware should comply with the Industrial Research and Standards (Section 44) (Children's Nightdresses) (Amendment) Order 1979 (SI 215 of 1979).

7.1 Flame Retardant (FR) Fabrics

There is a choice of flame retardant (FR) fabrics though it is recognised that these are usually more expensive than non flame retardant (FR) fabrics. The most common flame retardant (FR) fabrics available are durably FR treated cotton, FR polyester, modacrylic and durably FR treated wool.

The durability of the FR properties of fabrics should be checked by Water Soaking (BS 5651:1989 clause 3) and/or Dry Cleaning (BS 5651:1989 clause 4) prior to testing. The in situ treatment of fabrics to make them flame retardant is not recommended.

7.2 Fabric Cleansing

Fabrics which have been chemically treated to impart flame retardancy should be laundered or dry-cleaned with an

appropriate process in accordance with the manufacturer's instructions in order to maintain the effectiveness of the treatment.

Only appropriate processes which do not damage inherent or upgraded flammability properties should be used for cleaning or laundering fabrics.

7.3 Bedding

Bedding may be ignited by flaming and/or smouldering ignition sources such as matches, cigarettes, radiant heaters or by electric blankets. As a general functional requirement bedding materials should not easily ignite, and if ignition does occur, fire should not spread.

Mattresses, bed-bases and divans should resist ignition sources 0 and 5 when tested in accordance with BS 6807 :1990. Section 2. Filling materials should meet the requirements of I.S. 419 Clause 2 or Clause 3.

Mattress cases and waterproof covers, pillowslips, bedspreads, continental quilt covers and counterpanes should resist ignition sources 0 and 5 when tested in accordance with BS 7175 Section 3. Continental quilt covers and counterpanes meeting the requirements of BS 5815 Part 3 are also acceptable.

Pillows, continental quilts and duvets should resist ignition sources 0 and 5 when tested in accordance with BS 7175 Section 2. Filling materials should meet the requirements of I.S. 419 Clause 2 or Clause 3.

Blankets should resist ignition sources 0 and 5 when tested in accordance with BS 7175 Section 3. Blankets meeting the requirements of BS 5866 Part 4 are also acceptable.

Bed assemblies where the sheets, blankets, quilt and/or counterpanes are made from 100% polyester should be avoided.

7.4 Upholstered Furniture

Upholstered furniture can be ignited by a discarded lighted cigarette or match. It can also be ignited by ignition of materials on, underneath or adjacent to it. As a general functional requirement all upholstered furniture should be constructed of materials which cannot be easily ignited by a lighted cigarette or a small flaming source.

Upholstery in seating should, when tested in accordance with I.S./EN 1021-1:1994 (smouldering cigarette), indicate non ignition. When tested in accordance with I.S. 254: 1983: Flame resistance requirements for upholstery, should pass Ignition Source Grade 5. Filling materials should comply with I.S. 419: 1988 Clause 2 or Clause 3.

The covering fabrics of upholstered furniture should be maintained free of cuts and tears and filling materials should not be exposed. Polypropylene chair shells should resist Ignition sources 0 and 5 of I.S. 254 : 1983.

7.5 Curtains, Drapes and Blinds

As a general functional requirement vertical hangings should be made from materials which do not easily ignite, or which, if ignited, transmit flame for a short distance only.

Curtains, drapes, blinds and any lining fabrics used should comply with the performance requirements Type B of BS 5867: Part 2:1980 (1993) when subjected to Test 2A and 2B (face and edge) of BS 5438:1989.

7.6 Textile Floor Coverings

Floor coverings may be ignited by flaming and/or smouldering ignition sources, i.e. matches, cigarettes, etc., and may assist fire spread to furniture and fittings. As a general functional requirement, floor coverings should not ignite easily and if ignition does occur the fire should not spread.

Textile floor coverings (e.g. carpets) should be tested according to the method specified in BS 4790:1987: Method for the determination of the effects of a small source of

ignition on textile floor coverings - and assessed according to BS 5287:1988: Assessment and labelling of textile floor coverings tested to BS 4790:1987. The use of textile floor covering with a 'low radius of effects of ignition' is recommended.

7.7 Miscellaneous

Waste receptacles and ashtrays can pose a hazard if combustible materials in them are ignited. They should be made from materials which are not combustible. In common areas, waste receptacles with a separate ashtray top should be used.

Chapter 8

Fire Fighting Equipment

8.0 General

Strategic positioning of portable extinguishing equipment throughout a nursing home enhances the fire protection of the building, by enabling an attack to be made on a developing fire in its early stages by the staff. Portable extinguishing equipment does not itself offer protection, unless personnel are trained in its proper, safe, and effective use.

Fire fighting equipment in nursing homes should be provided using :

- portable fire extinguishers,
- hose reels,
- fire blankets.

8.1 Portable Fire Extinguishers

Water type portable fire extinguishers should be provided in sufficient numbers to give adequate cover on each floor. The number will depend on the size and layout of the building. On each floor there should be one water type extinguisher of 9 litres capacity for every 100 m² of floor area or part thereof. Two extinguishers of 4.5 litres capacity may be used instead of one of 9 litres. At least one extinguisher suitable for fires in electrical equipment should also be provided for each floor. This may be a carbon dioxide or general purpose (ABC) dry powder extinguisher.

Portable fire extinguishers should be manufactured to an appropriate standard, such as I.S. 290: 1988 or equivalent and be installed in accordance with the recommendations of I.S. 291 or equivalent. They should comply with the following general requirements:

- they should generally be located in conspicuous positions on brackets, stands or purpose-made housings where they can be readily seen and easily available for use.

- the most suitable locations for siting extinguishers are near to room exits, escape corridors, escape stairways, lobbies and landings. Extinguishers should not be positioned away from exits unless they are necessary to cover a particular hazard.
- extinguishers should be readily accessible and available for immediate use at all times, and should be so sited that it is not necessary to travel more than 20 m to reach an extinguisher.
- extinguishers should be mounted so that the carrying handle of large, heavy extinguishers is not more than 1 m from the floor, and smaller extinguishers should be mounted so that the handle is not more than 1.5 m from the floor.
- the operation of extinguishers is affected by temperature, and they should not be exposed to storage temperatures outside the operational range marked on the extinguisher. In particular, extinguishers should not be placed over or close to heat producing appliances.
- it is necessary that fire extinguishers are regularly inspected, maintained and recharged in accordance with the appropriate standards. Fire extinguishers that comply with I.S. 290 : 1986 should be inspected and maintained in accordance with I.S. 291, and other extinguishers with BS 5306 : Part 3 : 1985 and appropriate entries made in the fire safety register.

8.2 Hose Reels

Hose reels for fire-fighting should be installed in large premises in addition to water type fire extinguishers as they provide a continuous flow and allow for a longer period for fire-fighting. The number will depend on the size and layout of the building. In general where a compartment exceeds 400 m² in floor area hose reels should be provided.

Hose reels should comply with the requirements of I.S./EN 671-1:1995: Fixed firefighting Systems - Part 1: Hose reels with semi-rigid hose - and be installed to BS 5306: Part 1 1976 (1988) Hydrant systems, hose reels and foam inlets.

The distribution of hose reels should be such that a nozzle can be taken to within 6 m of the most remote part of the compartment. As in the case of fire extinguishers hose reels should be sited in prominent and accessible positions adjacent to escape routes. They should not form obstructions on escape routes, if necessary being installed in recessed cabinets.

8.3 *Fire Blankets*

At least one light duty fire blanket to BS 6575: 1985, or I.S. 415: 1988, should be fitted in kitchens for dealing with small cooking fires.

8.4 *High Risk Areas*

At least one portable fire extinguisher (carbon dioxide, dry powder or other type) suitable for electrical and flammable liquid fires should be provided to deal with each special risk, e.g. kitchen, laundry and central heating boiler. These should be sited near the risk concerned, but not so close as to be inaccessible in the event of fire. If the special risk is contained in a confined space or small room, it is generally advisable to place the extinguisher outside that space or room.

Large cooker hoods in kitchens should be fitted with an appropriate automatic extinguishing system .

Chapter 9

Access and Facilities for the Fire Service

9.0 General

Facilities should be available at nursing homes to enable effective rescue and fire fighting to be carried out in the event of a fire on the premises. Fire service response will also be enhanced where familiarisation visits to the premises by the fire brigade have been conducted (see 3.8).

For effective fire service response to a fire in a nursing home, there should be reasonable access to the building for fire appliances. In some situations, such as in the case of large buildings or where there are large numbers of occupants, and where the circumstances so warrant, special facilities may need to be provided to assist the fire service. These may include dry-rising mains for high buildings and in some cases firefighting lifts, to facilitate effective rescue and fire-fighting operations. High-fire risk areas, such as basement boiler rooms, may need special facilities such as foam inlets to be provided. There should also be access to reasonable sources of water for firefighting.

9.1 Access

In the event of an outbreak of fire in a nursing home, ease of access to the perimeter of the building for fire brigade appliances is important. This will greatly facilitate early commencement of rescue and fire fighting operations. Access is required to within a reasonable distance of the main entrance of the building and in larger buildings access to a number of points on the building perimeter is desirable. In the case of high buildings, access may be required for high-reach appliances to one or more elevations of the building. Gateways, access roadways and parking areas should be of adequate width and carrying capacity to facilitate access. It is advisable to liaise and discuss with the relevant fire authority the access facilities to every nursing home.

It is important that access is not restricted by car parking along access roadways and in areas which may be designated to be kept clear for fire appliances.

9.2 Facilities for the Fire Service

Facilities for the fire service in a nursing home will depend on the size and height of the building and the number of occupants. In very many cases, no special facilities will be required.

Where the floor of any storey is more than 20 m above the ground floor, a dry rising internal fire main, which is used to facilitate the provision of water for fire fighting on the upper floors, will be required. Where there are boiler rooms without external access in basement areas, it is normal to provide a foam inlet pipe to facilitate fire fighting in these areas.

Access to the building for fire fighting personnel will generally be by way of the normal entrance and exit facilities but in some exceptional cases, the provision of specially equipped lifts may be warranted. Familiarisation visits by the fire brigade (see 3.8) will allow an assessment of any such facilities to be made.

A supply of water should be readily available to enable the commencement of fire fighting operations, without undue delay. Water for fire-fighting, in addition to those quantities carried on fire brigade appliances, is normally made available from a number of possible sources, as follows:

- hydrants on external water mains, provided by the local authority in public areas, or which may be private mains within the grounds of the nursing home;
- sources such as rivers, canals, ponds, etc., where adequate access for pumping appliances is available, and which are within a reasonable distance of the nursing homes; or
- static storage tanks or reservoirs provided for this purpose.

The adequacy of the available water supplies for fire fighting should be determined following consultation with the relevant fire authority and any such additional facilities as may be found to be necessary in the particular circumstances should be provided.

Glossary

The following terms or expressions, where they are used in the Guide, have the meaning assigned to them below, unless otherwise stated in the text.

BASEMENT STOREY:	a storey, the floor of which is situated at such a level or levels that some point on its perimeter is more than 1.2 m below the level of the finished surface of the ground adjoining the building in the vicinity of that point.
CAVITY:	any space enclosed by the elements of a building, including a suspended ceiling, or contained within an element other than a room, cupboard, circulation space, protected shaft or the space within a flue, chute, duct, pipe or conduit.
CAVITY BARRIER:	construction provided to close a cavity or other concealed space against penetration of smoke or flame or provided to restrict the movement of smoke or flame within such a space.
CIRCULATION SPACE:	a space, mainly used as a means of access or egress, between any room and a final exit door from the building, including corridors, lobbies and stairway enclosures.
COMPARTMENT:	part of a building comprising one or more rooms, a storey or part of a storey, constructed to limit the spread of fire to or from another part of the building.
DUCT:	an enclosed space provided for the distribution of services in a building and includes a ventilation duct.
ESCAPE ROUTE:	a route by which a person may reach a place of safety, and, in relation to any point in a building, a route from that point to a place of safety.
FINAL EXIT:	the termination of an escape route from a building giving direct access to a place of safety, such as a street, passageway, walkway, or open space sited so as to ensure that persons are no longer in danger from fire or smoke.
FIRE DOOR:	a door, together with its frame and ironmongery, as installed in a building, which is intended to resist the passage of fire and/or gaseous products of combustion and which is capable of meeting specified fire performance criteria.
FIRE HAZARD:	the potential for loss of life or injury in the event of fire.
FIRE PROTECTION:	design features, forms of construction, components, systems or equipment in a building, provided to reduce the fire hazard to persons and property by detecting, extinguishing or containing fire.
FIRE RESISTING CONSTRUCTION:	construction or elements of construction which are intended to meet specific test criteria under specified fire exposure conditions for a specified duration.
FIRE RISK:	the probability of a fire occurring.

FIRE STOPPING:	a seal provided to close an imperfection of fit or design tolerance between elements, components, or construction in a building so as to restrict the penetration of smoke and flame.
HABITABLE ROOM:	any room in a building, with the exception of any kitchen, utility room, store room, bathroom, or toilet.
HIGH FIRE RISK AREA:	a room or space which because of its contents, or the activity carried on therein, poses an increased risk of fire occurring, or a danger of a more severe fire (eg. a kitchen, store room or laundry).
IGNITION SOURCE:	heat source or flames which will cause the ignition of combustible materials.
NURSING HOME:	has the meaning assigned to it in 2.2 of this Guide.
PLACE OF SAFETY:	a place in which persons are no longer in danger from fire.
PROTECTED LOBBY/CORRIDOR:	a circulation area consisting of a lobby or corridor enclosed with fire resisting construction and forming part of an escape route, or affording additional protection to an escape route.
PROTECTED ROUTE:	an escape route within a building leading to a final exit which is enclosed by fire resisting construction or an external wall.
PROTECTED SHAFT:	a shaft which enables persons, air or things to pass between different compartments, enclosed by fire resisting construction.
PROTECTED STAIRWAY:	a stairway, including any hall or space between the foot of the stairs and the final exit, which is adequately protected from fire in the accommodation through which it passes by fire-resisting construction and which leads through a final exit to a place of safety.
SERVICES:	installations for the introduction into and distribution within a building or structure of water, air, gas, liquid fuel, electricity, telecommunications, heat or other sources of energy and installations for fire protection.
STOREY:	any of the parts into which a building is divided horizontally above or below ground level but excluding any structure situated above the level of the roof or in the roof-space, or below the level of the lowest floor, which is intended for the protection of a water tank or lift motor or similar use and is not used for habitable purposes or as a workroom or store room.
TRAVEL DISTANCE:	the distance to be travelled by a person along an escape route.
STOREY EXIT:	a final exit or a doorway giving direct access to a protected stairway or external escape route.

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Appendix A

The Fire Services Act, 1981 - Outline of Main Provisions

The following is a brief outline of the main provisions of the Fire Services Act, 1981, as it relates to premises such as nursing homes. It is not intended to be a legal interpretation of the Act.

A.1 Legal Responsibilities

Section 18(2) of the Fire Services Act imposes a duty on persons having control over certain premises, including nursing homes, to:

"take all reasonable measures to guard against the outbreak of fire on such premises, and to ensure as far as is reasonably practicable the safety of persons on the premises in the event of an outbreak of fire."

Section 18(3) of this Act imposes a duty on every person on such premises, including occupants and visitors, to:

"conduct himself in such a way as to ensure that as far as is reasonably practicable any person on the premises is not exposed to danger from fire as a consequence of any act or omission of his".

A.2 Penalties

The Act provides for substantial penalties with fines of up to ten thousand pounds (£10,000) and/or two years imprisonment for persons convicted on indictment of an offence under the Act.

A.3 Fire Safety Notices

Under Section 20 of the Act, a fire authority may serve a fire safety notice on the owner or occupier of a "potentially dangerous building".

A "potentially dangerous building" is defined in Section 19 of the Act as a building which constitutes a serious danger to

life in the event of a fire occurring therein for a number of reasons outlined in that section.

A fire safety notice may prohibit the use of a building (or part of it) and may require the owner or occupier to carry out specified fire precautions in that building. There is provision in Section 21 of the Act for a person on whom a fire safety notice is served to appeal against the notice in the District Court.

In a situation of serious concern about fire safety, a fire authority may apply, under Section 23 of the Act, to the High Court for an order to restrict or prohibit use of such a building.

It is an offence under the Act to fail to comply with the terms of a fire safety notice, and penalties similar to those outlined above may be imposed on a person convicted of such an offence.

A.4 Powers of Inspection

Section 22 of the Act gives powers to any "authorised person" of a fire authority to inspect premises, including nursing homes. It is an offence under Section 22(6) to:

- refuse entry, at any reasonable time, to an authorised person, in the exercise of his duty;
- obstruct or impede an authorised person;
- fail or refuse to give information which a fire authority or an authorised person is entitled to require;
- provide false or misleading information to a fire authority or an authorised person.

An authorised person of a fire authority should be in a position to produce satisfactory identification, if so requested.

Appendix B

The Building Control Act, 1990

The following Regulations have been made under the above Act and are relevant to new works carried out in existing nursing homes.

S.I. No. 305 of 1991; BUILDING CONTROL REGULATIONS, 1991

S.I. No. 306 of 1991; BUILDING REGULATIONS, 1991

S.I. No. 111 of 1992; BUILDING CONTROL ACT, 1990 (APPEALS) REGULATIONS, 1992

S.I. No. 112 of 1992; BUILDING CONTROL ACT, 1990 (FEES) REGULATIONS, 1992

S.I. No. 182 of 1992; BUILDING CONTROL ACT, 1992 (FEES) (AMENDMENT) REGULATIONS, 1992

S.I. No. 153 of 1994; BUILDING CONTROL (AMENDMENT) REGULATIONS, 1992

S.I. No. 154 of 1994; BUILDING REGULATIONS (AMENDMENT) REGULATIONS, 1994

The Building Regulations, 1991 - First Schedule: Part B (Fire)

B1 Means of Escape

A building shall be so designed and constructed that there are adequate means of escape in case of fire, from the building to a place of safety outside the building, capable of being safely and effectively used.

B2 Internal Fire Spread (Linings)

For the purpose of inhibiting the spread of fire within a building, the internal linings:

- (a) shall offer adequate resistance to the spread of flame over their surfaces, and

- (b) shall have, if ignited, a rate of heat release which is reasonable in the circumstances.

B3 Internal Fire Spread (Structure)

- (1) A building shall be so designed and constructed that, in the event of fire, its stability will be maintained for a reasonable period.

- (2)(a) A wall common to two or more buildings shall be so designed and constructed that it offers adequate resistance to the spread of fire between those buildings.

- (b) A building shall be sub-divided with fire resisting construction, where this is necessary to inhibit the spread of fire within the building.

- (3) A building shall be so designed and constructed that the unseen spread of fire and smoke within concealed spaces in its structure or fabric is inhibited where necessary.

- (4) For the purposes of sub-paragraph 2(a), a house in a terrace and a semi-detached house are each to be treated as being a separate building.

B4 External Fire Spread

The external walls and roof of a building shall be so designed and constructed that they afford adequate resistance to the spread of fire to and from neighbouring buildings.

B5 Access and Facilities for the Fire Service

A building shall be so designed and constructed that there is adequate provision for access for fire appliances and for other such facilities as may be reasonably required to assist the fire service in the protection of life and property.

Material Alteration

The Building Regulations will apply to a material alteration of an existing building (Article 10 of the Building Regulations, 1991):

10(1) Subject to Articles 6 and 7, these Regulations shall apply-

- (a) to all works in connection with the material alteration or extension of an existing building (whether or not such building was erected before the operative date); and
- (b) to every part of an existing building as affected by a material alteration or extension, but only to the extent of prohibiting any works which would cause a new or greater contravention, in the existing building, of the provisions of these [Building] Regulations.

10(2) For the purposes of this article, "material alteration" means an alteration (other than a repair or renewal) where the work, or any part of the work, carried out by itself would be subject to a requirement of Part A (Structure) or Part B (Fire) of the First Schedule [to the Building Regulations].

Technical Guidance Document B

Technical Guidance Document B (Fire) has been published under article 5 of the Building Regulations, 1991, for the purpose of providing guidance on how to comply with Part B of the First Schedule to the regulations.

Where a material alteration is required in an existing building for the purpose of the Fire Services Act, 1981, the use of the relevant sections of this guide are regarded as satisfying the relevant fire parts of the Building Regulations in respect of those alterations.

Building Control Regulations: Fire Safety Certificates

Parts III and IV (articles 8 to 18 inclusive) of the Building Control Regulations, deal with fire safety certification.

A fire safety certificate is required for a material alteration, to which the requirements of Part B of the first schedule to the Building Regulations apply.

A fire safety certificate granted under the Building Control Regulations may be construed as certifying that the building, if constructed in accordance with the plans, documents and information submitted, would comply with the requirements of Part B of the First Schedule to the Building Regulations.

A fire safety certificate refers only to the design of a building or works. It does not apply to the building or works as constructed.

Commencement notices

Part II (articles 5 to 7 inclusive) deals with commencement notices.

Commencement notices allow a building control authority to monitor construction for compliance with the Building Regulations. Where a fire safety certificate is required, a commencement notice is also required. They do not relieve the person who carries out the work of responsibility to comply with the requirements of the Building Regulations. A commencement notice is served on the building control authority not less than 7 days and not more than 21 days before the commencement of the works.

Appendix C

Nursing Homes (Care and Welfare) Regulations, 1993 - (S.I. No. 6 of 1993) as amended by Nursing Homes (Care and Welfare) (Amendment) Regulations, 1994 (S.I. No. 147 of 1994)

Fire Precautions

27.1 The registered proprietor and the person in charge of the nursing home shall:

- (a) take adequate precautions against the risk of fire, including the provision of adequate means of escape in the event of fire and make adequate arrangements for detecting, containing and extinguishing fires, for the giving of warnings and for the evacuation of all persons in the nursing home in the event of fire, and for the maintenance of fire fighting equipment;
- (b) make adequate arrangements to secure by means of fire drills and practices that the staff, and so far as is practicable, dependent persons in the nursing home, know the procedure to be followed in the case of fire;
- (c) take all reasonable measures to ensure that materials contained in bedding and the internal furnishings of the nursing home have adequate fire retardancy properties and have low levels of toxicity when on fire;
- (d) ensure that emergency lighting is provided in the home.

27.2 The registered proprietor shall:

- (i) supply to the health board with the application for registration of the nursing home, written confirmation from a competent person that the requirements of article 27.1 (a), (b), (c) and (d) and articles 28.1 and 28.2 have been complied with, or
- (ii) where, in the opinion of a competent person, the home does not comply with the requirements of article 27.1 (a), (b), (c) and (d) and articles 28.1 and 28.2, supply to

the health board a written schedule prepared by a competent person of measures which would enable the home to comply with the provisions of the above articles by a date to be agreed by the health board.

27.3 A written confirmation provided in accordance with Article 27.2 (i) shall suffice on any subsequent registration of the nursing home, save where structural alterations to the home have been carried out, in which case, a new written confirmation in accordance with Article 27.1 (i) shall be produced to the Health Board.

Fire records

28.1 In every nursing home there shall be kept in a safe place a record of:-

- (a) all fire practices which take place at the home;
- (b) all fire alarm tests carried out at the home together with the result of any such test and the action taken to remedy defects;
- (c) the number, type and maintenance record of firefighting equipment.

28.2 In every nursing home the procedure to be followed in the event of fire shall be displayed in a prominent place in the nursing home.

Appendix D

Materials of Construction

Non-Combustible Materials

- (a) Any material which when tested to BS 476: Part 11: 1982 (1988) does not flame and there is no rise in temperature on either the centre (specimen) or furnace thermocouple.
- (b) Totally inorganic materials such as concrete, fired clay, ceramics, metals, plaster and masonry containing not more than 1 per cent by weight or volume of organic material. (Use in buildings of combustible metals such as magnesium/aluminium alloys should be assessed in each individual case).
- (c) Concrete bricks or blocks meeting I.S. 20 : 1974; I.S. 20 Part 1 : 1987 or I.S. 189 : 1974.
- (d) Products classified as noncombustible under BS 476: Part 4: 1970 (1984).

Non-combustible materials may be used whenever there is a requirement for materials of limited combustibility.

Materials of Limited Combustibility

- (a) Any non-combustible material listed above.
- (b) any material of density 300 kg/m³ or more which when tested to BS 476: Part 11, does not flame, and the rise in temperature on the furnace thermocouple is not more than 20°C.
- (c) Any material with a non-combustible core at least 8 mm thick having combustible facings (on one or both sides) not more than 0.5 mm thick. (When a flame spread rating is specified, these materials must also meet the appropriate test requirements).
- (d) Any material of density less than 300 kg/m³, which when

tested to BS 476: Part 11, does not flame for more than 10 seconds and the rise in temperature on the centre (specimen) thermocouple is not more than 35°C and on the furnace thermocouple is not more than 25°C.

Typical Performance Ratings of Some Generic Materials and Products

RATING	MATERIAL OR PRODUCT
Class 0	1. Any non-combustible material or material of limited combustibility.
	2. Brickwork, block-work, concrete and ceramic tiles.
	3. Plasterboard (painted or not, with or without an air gap or fibrous or cellular insulating material behind).
	4. Woodwool cement slabs.
	5. Mineral fibre tiles or sheets with cement or resin binding
Class 3	6. Timber or plywood with a density more than 400 kg/m ³ , painted or unpainted.
	7. Wood particle board or hardboard, either treated or painted.
	8. Standard glass reinforced polyesters.

- NOTES: (1) Materials and products listed under Class 0 also meet Class 1.
- (2) Timber products listed under Class 3 may be brought up to Class 1 with appropriate proprietary treatments.

Appendix E

Fire Safety Register

The Fire Safety Register should contain the following detailed information

1. Premises Details

Address,
Owner,
Matron,
Fire safety manager,
Deputy fire safety manager(s)

2. Staff Training Details

3. Fire and Evacuation Procedures

4. Details of Fire and Evacuation Drills

Dates,
Times,
Description,
Follow-up

5. Fire Fighting Equipment

Inventory,
Inspection details,
Maintenance details

6. Fire Detection and Alarm System

Zone details,
Location of detectors,
Location of manual call points,
Inspection details,
Maintenance details,
Details of works carried out.

7. Emergency Lighting

Inventory of fittings,
Inspection details,
Maintenance details,
Details of works carried out.

8. Fire Doors

Inventory of fire doors in building,
Inspection details,
Maintenance details,
Details of works carried out.

9. Bedding and Furniture

Inventory, suppliers, specifications and test certification for:

Bedding,
Upholstered furniture,
Curtains, drapes and blinds,
Floor coverings.

10. Electrical Installations

Completion certificate,
Details of routine inspections and testing,
Details of any alterations,
Details of servicing of appliances.

11. Gas Installations

Certificate of compliance,
Details of routine inspections,
Details of any repairs or alterations,
Details of servicing of appliances

Appendix F

Reference Standards

Irish Standards

National standards Authority of Ireland

IS 254: 1983	Flame resistance requirements for upholstery
I.S. 265 : 1989	Installation of gas service pipes
I.S. 290 : 1986	Portable fire extinguishers
I.S. 291: 1986	The use, siting, inspection and maintenance of portable fire extinguishers
I.S. 327: 1990	Domestic installations using LPG
I.S. 415: 1988	Fire Blankets
I.S. 419: 1988	Fire safety requirements for components of furniture.
I.S. 3212: 1987	Code of Practice for piped installation of fixed gas fired space heaters.
I.S. 3213: 1987	Code of Practice for the Storage of LPG Cylinders and Cartridges.
I.S. 3216: 1988	Code of Practice for the Bulk Storage of LPG
I.S. 3217: 1989	Code of Practice for Emergency Lighting
I.S. 3218: 1989	Fire Detection and Alarm Systems
I.C.P.3: 1989	Domestic installations for manufactured and natural gas
I.C.P.4: 1989	Non-Domestic Installations for Manufactured and Natural Gas
I.S./EN 671	Fixed Fire Fighting Systems Part 1: 1985 Hose Reels with Semi-rigid hose

I.S./EN 1021

Furniture - Assesment of the ignitibility of upholstered furniture
Part 1:1994 Smouldering cigarette

British Standards

British Standards Institution

BS 476	Fire tests on building materials and structures Part 4: 1970 (1984) Non-combustibility test for materials Part 6: 1989 Method of test for fire propagation for products Part 7: 1987 (1993) Method for the classification of the surface spread of flame of products Part 11: 1982 (1988) Method for assessing the heat emission from building products Part 20: 1987 Method for determination of the fire resistance of elements of construction (general principles) Part 21: 1987 Methods for determination of the fire resistance of loadbearing elements of construction Part 22: 1987 Methods for determination of the fire resistance of nonloadbearing elements of construction Part 23: 1987 Methods for determination of the contribution of components to the fire resistance of a structure Part 24: 1987 Method for determination of the fire resistance of ventilation ducts
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	Part 31: Section 31.1: 1983 Methods of measuring smoke penetration through door-sets and shutter assemblies. Method of measurement under ambient temperature conditions	BS 5651:1989	Method for cleansing and wetting procedures for use in the assesement of the effect of cleansing and wetting on the flammability of textile fabrics and fabric assemblies.
BS 4790:1987	Method for the determination of the effects of a small source of ignition on textile floor coverings(hot metal nut method)	BS 5720: 1979	Code of practice for mechanical ventilation and air conditioning in buildings
BS 5287:1988	Specification for the assessment and labelling of textile floor coverings tested to BS 4790.	BS 5815:	Sheets, sheeting, pillowslips, towels, napkins, counterpanes and continental quilt covers suitable for use in the public sector
BS 5306	Fire extinguishing installations and equipment on premises Part 1: 1976 Hydrant systems, hose reels and foam inlets Part 3: 1985 Code of practice for the selection, installation and maintenance of portable fire extinguishers.		Part 3: 1991 Specification for counterpanes and continental quilt secondary covers including flammability performance.
BS 5410	Code of Practice for oil firing Part 1:1977 Installations up to 44 KW output capacity for space heating and water supply purposes.	BS 5866:	Blankets suitable for use in the public sector. Part 4: 1991 Specification for flammability performance
		BS 5867:	Specification for fabrics for curtains and drapes. Part 2 :1980 (1993) Flammability Requirements
		BS 6575: 1985	Specification for Fire Blankets
BS 5438: 1989 (1995)	Methods of test for flammability of textile fabrics when subjected to a small igniting flame applied to the face or bottom edge of vertically oriented specimens.	BS 6807: 1990	Methods for test for the assesement of the ignitibility of mattresses, divans and bed bases with primary and secondary ignition sources
BS 5588	Fire precautions in the design, construction and use of buildings Part 9: 1989 Code of practice for ventilation and air conditioning duct-work	BS 7175: 1989 (1994)	Methods for test for the ignitibility of bedcovers and pillows by smouldering and flaming sources of ignition
		PD 6520: 1988	Guide to fire test methods for building materials and elements of construction

Appendix G

Reference Publications

Technical Guidance Document B, Fire, to the Building Regulations, 1991.

Technical Guidance Document K, Stairways, ramps and guards, to the Building Regulations, 1991.

Increasing the fire resistance of existing timber floors. BRE Digest 208, 1988.

Fire test results on building products: fire propagation. FPA, 1980 (updated 1986).

Fire test results on building products: fire resistance. FPA, 1983.

Regulations for Electrical Installations, 15th Edition, 1981
Institution of Electrical Engineers.

Guidelines for the construction of fire-resisting structural elements.

Building Research Establishment, 1988 (BR128).

Increasing the Fire Resistance of Existing Timber Floors.
Building Research Establishment, 1988 (Digest 208)

Fire Protection of Timber Floors

The Association of Specialist Fire Protection Contractors and Manufacturers.

Fire Protection for Structural Steel in Buildings

The Association of Fire Protection Contractors and Manufacturers, Fire Test Study Group and the Steel Construction Institute.

National Rules for Electrical Installations (ET 101, 2nd Edition 1991)

The Electro-Technical Council of Ireland (ETCI)

NHS Estates, Firecode Health Technical Memorandum 83

Fire safety in healthcare premises - General fire precautions

HMSO: London

Industrial Research and Standards (Fire Safety) Domestic Furniture Order, 1995 Order (S.I. No 316 of 1995)

Industrial Research and Standards(Section 44) (Childrens Nightdresses) (Amendment) Order 1979 (S.I. No 215 of 1979)

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