Housing Learning and Improvement Network

Housing LIN

Fire Safety in Extra Care Housing in the UK

This technical brief looks at fire avoidance and control strategies in Extra Care Housing developments implemented at design and construction stages with particular reference to lessons learnt and current day legislation.

The technical brief concludes with an overview in respect of a building owner or manager's responsibility as 'a responsible person' when actively managing the 'fire risk assessment' throughout the lifetime of an Extra Care Housing development with particular consideration to the developing frailty of the residents.

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Introduction

Outside of the fire fighting and emergency services, few people have had first-hand experience of a fire and it is difficult to explain the terror, panic and threat that one feels when a fire is first encountered and especially so when an outbreak becomes uncontrollable. In both Extra Care and specialist housing developments, the terror effect is heightened when dependent and sometimes frail and confused residents are involved. Apart from the risk to life and property damage, a serious fire disrupts resident care, well being and leaves residents with feelings of insecurity leading to a loss of confidence in the building and their neighbours.

The financial and organisational ramifications from fire damage can be considerable for the landlord, often costing many thousands of pounds together with the unquantifiable and possible long term consequences in terms of income loss from void properties that potential bad publicity may cause.

A thorough fire avoidance and control strategy when designing Extra Care Housing developments combined with an appreciation of the fire risks, both during construction by building contractors and upon occupation by the building owners/managers will ensure that all aspects of fire safety will be covered from design inception through to construction, completion, occupation and beyond throughout the lifetime of the building.

It is essential to minimise the likelihood of fires occurring and that if they do, they can be controlled by being contained quickly, effectively and safely without risk to the occupants. Furthermore, if a fire does occur and grows, everyone in the building must be able to escape to a place of total safety easily and quickly as part of a structured evacuation process with due consideration given to the age, disabilities and frailty of the residents.

It is vital that building designers, building contractors, managers and owners, by the implementation of a structured assessment processes when applying the regulations understand that they have a duty to:-

- Reduce deaths and injury from fire.
- Promote fire prevention awareness and activity, particularly amongst the most vulnerable sectors of the community which includes older persons in receipt of care in their accommodation.

This technical briefing will endeavour to address these issues, illustrated with options for consideration as part of the design and management processes associated with Extra Care Housing developments in the UK.

1.0 Recent Fire Statistics –

It is estimated that each year in the UK there are between 800 and 900 fires in premises providing care for older persons. During the decade preceding 2007, more than 45 people died in such fires with over 1,000 being injured. Up to this date on average five people per year died as a result of fire and a further 90 are injured.

1.0.1 Fire statistics Monitor Report (April 2009 to March 2010)

The latest National Statistics on fires, casualties, false alarms and non-fire incidents attended by the Fire and Rescue Services in England, produced by Department of Communities and Local Government, were released on 20 August 2010, these being the latest available figures for the period April 2009 to March 2010 being recorded under the new Incident Recording System (IRS).

Fatal and non-fatal casualties across all building types in the UK:-

- Between April 2009 and March 2010 there were 328 fatalities; five (one and a half per cent) more than in 2008-09. Accidental dwelling fire fatalities, which account for almost two thirds of all fire fatalities, were up by one from 209 in 2008-09 to 210 to 2009-10.
- In 2009-10, the number of non-fatal casualties from fires fell by 8 per cent to 8,500 from 9,200 in 2008-09.

Fire Incident types:-

- In England the Fire and Rescue Services attended 527,000 fire and false alarm incidents in 2009-10 across all building types - a 6 per cent decrease on 2008-09.
- Total fires fell by 3 per cent to 242,000.
- Dwelling fires were unchanged at 39,000.

Whilst these statistics do not relate directly to Extra Care or older persons dwellings, we see trends being more of less stable in terms of fire casualties in dwellings.

Some housing developments recently involved in fires have been well documented in the press and to a certain extent, have been the victim of media driven exaggeration. However it is important to place these events into perspective in the context of current day fire legislation and learn from them when constructing, designing and managing Extra Care Housing.

1.0.2 Lessons learnt

Lessons to be learnt from an appraisal of recorded historical fire incidents in older persons housing, when viewed in the context of current day legislation are numerous, as many of the fire safety design failings would not now be permitted due to more stringent legislation in force.

However any fire highlights the importance of active management as required from the building owner as the *'responsible person'* under the current Regulatory Reform (Fire Safety) Order 2005. Many of the fire hazards are normally addressed as part of implementing an active '*fire risk assessment'* which highlights the necessity to invest in up-to-date fire safety measures, these being mandatory practice in older persons Extra Care Housing developments. This matter is covered in detail in sections 6.0. & 7.0 below.

2.0 Construction Fire Safety –

2.0.1 HSG168 '*Fire Safety in Construction*'

Originally published by the Health and Safety Executive in 1997, guidance document HSG168 (Second edition, published 2010) '*Fire Safety in Construction*' recognises that where construction site management and activities are not adequately considered or controlled with respect to the particular construction type, especially so with modern methods of construction such as timber frame or similar derivatives, neighbouring buildings and members of the public can be exposed to severe and potentially lethal risks should a fire break out.

The guidance uses the same basic terminology as the Regulatory Reform (Fire Safety) Order 2005 to aid carrying out the fire risk assessments in respect of a construction site utilising five basic steps:

- Step 1 – identify the hazards with reference to sources of fuel and ignition.
- Step 2 – identify people at risk not only site operatives but members of the public.
- Step 3 – evaluate, remove, reduce and protect from risk the construction works.
- Step 4 – record, plan, inform, instruct and train site operatives to be vigilant and the appointment of a fire safety officer dedicated to larger sites.
- Step 5 – review procedures throughout the developing evolution of the building construction process, modifying the fire risk assessment accordingly.

When carrying out the initial design fire risk assessment as part of the CDM obligations on a new build timber framed development, the designer or contractor (under a Design and Build form of contract) will need to consider matters outlined in Appendix 3 of HSG168 such as:

- The location of the site and proximity to neighbouring properties.
- The construction, occupation and use of those neighbouring properties and their susceptibility to spread of fire.
- The type of construction materials to be specified in the proposed Extra Care development with particular reference to fire susceptibility throughout the construction stages..
- The nature of construction of any refurbishment work being carried out.
- Whether any site activities will be so hazardous as to increase the risk of a fire starting unseen and developing especially after the site has closed for the day. (e.g carry out hot work on steelwork that may support part of a timber frame construction early in the day). Consider the use of 'push fit' pipe work connections in lieu of hot welded.
- The possibility of an arson attack with respect to the locality in which the development is being constructed demanding additional security measures such as CCTV, site fire detection equipment and enhanced levels of fire fighting apparatus.
- On sites vulnerable to arson attack, implement the early installation of plasterboard cladding, as fire protection, and windows and doors for security to the lower floors.
- Store flammable materials in locked containers or away from site boundaries.

2.0.2 Construction Fire Safety Risk Assessment design implications

A construction fire risk assessment may very well determine the construction of the building.

For instance a design and build contractor recognizing that a modern method of construction may be more vulnerable to fire during construction necessitating additional stringent and costly fire prevention measures over and above normal good practice to satisfy insurers, may realise that it would be more cost effective to specify a more traditional construction method.

3.0 Timber Frame Buildings –

The use of timber frame together with other innovative construction products and techniques, have increased markedly in recent years as response to the requirement for sustainable building construction methods especially in social and Extra Care Housing where this construction method currently accounts for 60% of all new build developments.

3.0.1 Fire Risks during Construction

Where fires during construction have occurred, the resulting damage sustained has generally been greater than with traditional construction techniques as highlighted in the following examples:

Example: Carisbrooke Gardens, Peckham:

A severe fire in November 2009, subsequently proved to be an arson attack, in a five storey development under construction consisting of 39 homes, highlights the problem of rapid fire spread through part finished timber framed buildings which, in the Peckham fire, went on to spread to two nearby blocks of flats and a pub leading to a large scale evacuation of the area.

The fire resulted in a meeting between the Chief Fire Officers Association (CFOA), the Department of Communities and Local Government (DCLG) and the Timber Frame Association (TFA).

Example: Gershwin Road, Basingstoke:

The most recent fire, suspected to be another arson attack, broke out in a partially constructed four storey timber framed Extra Care building in Basingstoke in September 2010 which, as with Peckham, grew in size to threaten neighbouring properties before being brought under control.

Chief Fire Officers Association & CLG Response

As a result of the recent serious fires on construction sites where timber frames have been specified, the Chief Fire Officers Association (CFOA) states that *"Large timber framed buildings under construction pose a significant risk to firefighters, construction workers and members of the public"* as fires in these partially completed buildings attack the structure directly which can lead to total failure and collapse.

The Government Department which oversees the Fire and Rescue Service, (DCLG), are commissioning research into firefighting in timber framed buildings and also fire spread within and beyond such buildings. The CFOA is calling for this research to be accelerated and the findings published as a matter of urgency.

Timber Frame Association Response

Following these timber frame fires, a spokesperson for the Timber Frame Association said they would discuss whether building control departments would be willing to automatically notify fire brigades of the building materials – timber frame, brick or steel – used on certain construction sites in their area. *"They could then liaise more closely with health and safety and building inspectors to make sure guidelines are complied with."*

Insurance companies are becoming increasingly concerned about the high value of claims arising from partially constructed timber frame fires with inevitable premium increases where this method of construction is adopted.

3.0 Timber Frame Buildings – (cont'd)

The importance of employing a good Clerk of Works, experienced in timber frame construction to ensure that high standards of workmanship are implemented thereby mitigating the effect of any fire during occupation on site cannot be over estimated.

3.02 Monitoring High Quality Workmanship during Construction

Structural Integrity:- It is recommended that the client commissions a series of independent specialist written and photographic inspections (such as TRADA Framecheck), during the course of erection commenting on the timber frame stages whilst making the Contractor aware, in the tender documentation, that it will be his duty to rectify and report back his actions taken related to all defective matters observed during the course of construction. By this process both the client and the contractor have a record of events ensuring that the building fully complies with the frame manufacturer's and Building Regulations requirements for both structural integrity and fire protection.

Fire Compartmentalisation and Frame Protection:- Additionally, any defective workmanship in the fire compartmentalisation must be recognised early during the first fix installation of the structural fire protection process, (normally plaster boarding) which must adhere strictly to the manufacturers requirements. Should there be any doubts with the workmanship, rectification works must be carried out diligently and the importance of correct fire protection installation stressed to the workforce. The building contractor should adopt a strict signing off procedure with the sub contractors in respect of each fire compartment and element of fire protection.

3.03 Fire Risks during Occupation

Following analysis of fires in occupied timber framed buildings, the CLG has concluded that whilst there was a clear requirement for risk assessments to be carried out on the basis of the specific circumstances of any building under construction, *"we are not aware of any evidence to suggest that timber frame buildings, once properly completed, present a greater risk to life than other buildings."*

Example: The Sorting House, Manchester

Though not an Extra Care Housing scheme, a single apartment in a fully occupied old four storey timber framed extension constructed on the roof of an existing building known as The Sorting House, Manchester was subject to a severe fire in July 2005, two years after completion. A fire in a bedroom of a top floor apartment started, it was later confirmed, by lighted candles left burning on a window ledge.

The fire grew to be pretty ferocious, consuming all furnishings within a few minutes and eventually blowing out the windows destroying the whole room with extensive smoke damage to the whole apartment. The tenant, though suffering from smoke inhalation, escaped with her life.

The fire brigade were able to contain the fire within the single apartment and extinguish it. Subsequent investigations by fire investigators found that whilst the apartment was severely affected, the plasterboard clad fire compartment walls to the neighbouring apartments and ceilings had remained intact and had contained the fire. Upon opening the walls up they were delighted to find that the timber framed structure and insulation was in *"pristine condition completely unaffected by the inferno".*

Because of this, the reinstatement of the apartment was quickly carried out and at the same time gave reassurance to the residents that the timber framed building with the structural fire protection installed constructed to good workmanship standards, was no more vulnerable than a traditionally constructed building.

3.0 Timber Frame Buildings – (cont'd)

3.04 Conclusions with Industry response

The Fire Statistics Monitor – April 2009 to March 2010 in an *Analysis of Fires in Timber Framed Buildings* *Not Under Construction* concluded that whilst fires in timber frame construction tend to have a greater area of damage, the casualty rates are very similar in both dwellings of timber frame construction and in dwellings of traditional construction.

It was of concern though that the identification of the building type when completed and occupied was not always evident when carrying out the research and probably less evident when the fire brigade attends a fire.

The Timber Frame Association has concluded that *"the fire integrity of completed timber frame buildings is absolutely not in doubt"* however there are more things that the industry must address before and during the construction process (such as higher levels of effective site security, site monitoring and storage policies) in order to reduce the possibility of arson attack and if a fire does break out, introduce measures to assist the fire brigade to contain it.

In recognition of this requirement to minimize the potential fire attack risk of timber frame whilst being constructed, certain initiatives are now being adopted by the UK Timber Frame Association and the Fire Protection Association:

3.05 UK Timber Frame Association & Fire Protection Association Guidance

UKTFA - 'SiteSafe'

Approved by the CFOA, the UK timber Frame Association has introduced 'SiteSafe' as an initiative to minimise the risk of fire on timber frame construction sites going beyond current legislation relying on the collaborative working of the entire construction supply chain.

Site safe is aimed at the larger projects of four or more storeys with a floor area exceeding 2,500m^2 which is typical of a modern Extra Care Housing development.

A fire risk assessment procedure is adopted over three stages:-

- Pre-construction planning
- Erection of the timber frame
- Completion and handover

SiteSafe ensures all contractors involved in timber frame sites are fully briefed on identifying fire risks during the construction phase. While the responsibility for addressing the fire risk lies with the principal contractor, SiteSafe provides a framework through which any risk can be consistently communicated so that appropriate action can be taken.

FPA - Code of Practice

The Construction Confederation and Fire Protection Association in May 2009, published *Fire Prevention on Construction Sites*- Joint Code of Practice, 7th edition, as guidance to fire prevention on the larger high value construction sites such as a typical Extra Care Housing development.

Compliance with this Code often forms a condition of insurance. The Code describes a series of simple precautions and safe working practices which, if adopted, will ensure that adequate detection and prevention measures are incorporated during the design and planning stages, and that work on a site is undertaken to the highest standard of fire safety.

There is also the *Construction Site Fire Prevention Checklist* which is particularly helpful in offering a tick-list of things to consider, including security measures, storage of flammable materials, hot work on site and many other issues.

4.0 Fire Safety Design Legislation –

Whilst this technical briefing paper will not be dealing in detail with the legislation that architects and designers need to comply with, alternative approaches in addition to Approved Document B of the Building Regulations are available and more applicable to the scale of Extra Care Housing developments and these options should be discussed with an Approved Building Inspector at the outset of the design process.

4.0.1 Building Regulations Approved Document B (ADB)

It is important to remember that ADB is a set of guidance recommendations that set out one way of satisfying the Building Regulations. The ADB works very well with simple buildings, being a prescriptive approach to fire safety, but it does not deal so well with larger buildings such as the more complex Extra Care schemes. ADB doesn't often result in an efficient strategy tailored to the individual characteristics of the building design and method of operation and use which demands a performance based solution.

4.0.2 BS 9999 'The Code of Practice for Fire Safety in the Design, Management and Use of Buildings'

Approved Document B refers to the old BS 5588 for the 'Design of Fire Precautions within Buildings', however this is now largely superseded by BS 9999 'The Code of Practice for Fire Safety in the Design, Management and Use of Buildings' which has a more flexible approach to the requirements of ADB but does not replace it. The interiors of the flats or apartments are not covered by BS 9999.

BS 9999 is aimed at designers or architects who are not specialists in fire engineering (but will need some knowledge) to develop simplistic fire engineering solutions, although by following well defined routes to reach those solutions and by offering greater flexibility than ADB is often used as an alternative in the design of Extra Care Housing.

Whilst BS 9999 tends to result in more efficient escape routes than the ADB, other additional fire safety systems may be needed such as automatic fire detection for instance. Therefore BS 9999 becomes more useful on larger projects where these sorts of facilities become a mandatory requirement.

4.0.3 BS 7974:2001 'Application of Fire Safety Engineering Principles to the Design of Buildings Code of Practice'

In more complex and larger Extra Care developments, where there are additional features other than those listed in BS 9999, a more sophisticated fire engineering approach may be needed. In this instance, the alternative guidance and recommendations included in BS 7974:2001 'Application of Fire Safety Engineering Principles to the Design of Buildings Code of Practice' should be considered.

This British Standard provides a framework for an engineering approach to the achievement of fire safety in buildings with recommendations and guidance on the application of scientific and engineering principles to the protection of people, property and the environment from fire. It also provides a framework for developing a rational methodology for the design of buildings.

BS 7974:2001 applies to the design of new buildings and the appraisal of existing buildings and the adoption of this standard will facilitate the practice of fire safety engineering and in particular it will:

a) provide the designer with a disciplined approach to fire safety design;
b) allow the safety levels for alternative designs to be compared;
c) provide a basis for selection of appropriate fire protection systems;
d) provide opportunities for innovative design;
e) provide information on the management of fire safety for a building.

4.0 Fire Safety Design Legislation – (cont'd)

Whilst BS 7974 provides greater flexibility over BS 9999, it also requires a much greater level of skill to interpret, therefore developing fire engineering solutions using BS 7974 is usually best left to a consultant Fire Engineer.

Examples where this would come into play, is in the design of multi storey internal atria or galleries with apartments accessed off them at the upper floor levels now being increasingly adopted in the larger Extra Care Housing developments across the UK.

4.0.4 Fire Engineered Solutions in Extra Care Housing

As 'fire engineering' is based upon the setting up of risk profiles for the specific building, so it becomes important at the earliest stages that the consultant Fire Engineers understand the end users, their management systems and their operations.

If certain aspects are unknown at the time of the early stages of design of an Extra Care development, (e.g. it may be uncertain whether a publically accessible day centre or a licensed bar may be operated, in which case additional requirements in terms of fire exit arrangements and detection may apply) reviewable assumptions will need to be made, these being clearly documented on the fire strategy drawings so that the end user understands their obligations.

Therefore, the fire strategy and drawings should be reviewed (and revised if necessary), at both detailed design and project completion stages, in order to truly reflect the completed building as well as the operation and management of the premises including the evacuation strategy as agreed with Building Control. Additionally, in the more complex buildings, ongoing dialogue with Fire Officers and Building Control throughout the design, construction and completion process is important in order to inform them of the nature of the development whilst considering the options available.

Although it is not advisable to 'cherry pick' the best bits from several documents, a good Fire Engineer should be able to suggest, by referencing other documents the most effective way to develop alternative fire engineering solutions for a particular situation. However, this doesn't mean that fire engineering can only be of benefit where the recommendations of the ADB or BS 9999 cannot be met other than through efficiencies in the fire strategy.

The more recent larger Extra Care Housing developments are increasingly adopting fire engineered design specifications tailored to the individual building where some or all of the following may be appropriate:

- automatic smoke venting (with manual override) to escape stairs, corridors and galleries.
- smoke control curtains to galleries and atria.
- additional fire detection or smoke lobbies within apartments where accessed off galleries, atria or lift lobbies.
- introduction of automatic fire suppression systems (sprinklers or misting systems) allowing relaxations in other aspects of the design.
- dry riser installations in multi rise buildings
- design of external landscaping to accommodate a fire appliance access routes

Fire engineered solutions in the larger Extra Care developments and agreed with Fire Officers may result in cost benefits beyond the limitations of the Building Regulations but without compromising design or safety such as:-

- extended fire escape travel distances
- the elimination or reduction of certain elements of passive structural fire protection
- a reduction in the number of fire escape stairs
- the elimination of smoke control measures by a tailored solution
- the acceptance of higher site densities or closer building proximity on urban sites

5.0 Fire Safety Design & Specification Considerations

5.0.1 Design Feasibility

From the earliest feasibility studies and throughout the design and development process of Extra Care Housing, whether the building be traditionally commissioned or procured through the 'design and build' route, the following fire safety considerations must be borne in mind by the project team:-

1. Fire compartmentalisation.
2. Horizontal and vertical separation.
3. Fire escape travel distances.
4. Fire detection apparatus.
5. Extent of fire protection and suppression systems.
6. Fire fighting installation.

General feasibility layouts showing compartmentalisation, horizontal and vertical fire separation and fire escape travel distances should be produced at the earliest stage acting as 'working tools' in discussions with building controls departments and / or fire officers and clients. Fire protection and suppression systems (where required) will need to be added as the design progresses.

If necessary, due to the complexities of fire and smoke control considerations if the client and architect are considering open plan features such as atria or multi level galleries and with the possibility of dwelling access directly off the galleries, it is advisable that a fire engineering consultant is brought into the team at feasibility stage to ensure a cost effective solution.

A fire engineering consultant will be able to interpret fire legislation to the benefit of the development in terms of potentially extending travel distances or reducing the number of fire escape staircases where fire suppression systems such as sprinklers or misting systems are being considered. Suggestions such as fire fighting lifts, with emergency power back up, may be adopted in medium or high rise Extra Care developments together with dry riser installations and additional fire security measures necessary with more open internal layouts.

5.0 Fire Safety Design & Specification Considerations – (cont'd)

5.0.2 Fire Alarms, Automatic Detection System and Associated Interfaces Generally

A fire alarm and detection system must be provided in accordance with the requirements of **BS5839 parts 1 and 6 Fire detection and fire alarm systems for buildings,** related to both the specific building and the flats.

There must be an automatic fire detection system throughout the building, with detectors sited in all flats, along escape routes (including rooms that open onto escape routes) all communal areas and rooms or areas of high fire risk to occupants. Plant rooms and kitchens should normally have heat detectors fitted in preference to smoke detectors or rooms where the latter would otherwise cause frequent and unnecessary activation.

As a minimum, the installation should be in accordance with the following but the final configuration and layout must be agreed with Fire and Building Control Officers:-

5.0.3 Landlord's areas

For landlords areas the system should be of the analogue addressable pattern designed to **BS5839 part 1 category L3 (for ancillary areas) and L5 (in common apartment areas)** and comprise alarm/indicating equipment, automatic sensors, audible indication, visual indication (as required in noisy areas such as catering kitchens or plant rooms), manual break glass call points, interface units etc.

Interface units must be provided to facilitate correct fire alarm operation and activation of the following equipment :

- Automatic opening vents
- Smoke curtains (where installed)
- Lifts
- Mechanical plant
- Warden call/door entry system
- Automatic doors/Power door openers
- Fire suppression systems (mist system and kitchen canopy suppression)

Fire alarm cabling should be suitably fire resistant being routed within the building voids and generally flush fixed elsewhere. Cross corridor doors will be fitted with magnetic door hold open devices, which will de-energise in the event of fire alarm activation.

Any automatically actuated security doors between public and private areas or any external entrance doors held on magnetic locks must be set up to 'fail safe' and release the magnetic lock but not power open, being available for manual operation, which will still maintain the fire compartment and control smoke migration whilst allowing escape.

The fire alarm panel together with an easily readable fire compartment zone diagram should be located at the main entrance to the building, the normal position being in the entrance lobby where it is readily accessible to the fire brigade being easily seen from outside. This location also enables staff to monitor the panel and take appropriate and timely action in the event of activation. In more complex properties, additional fire panels should be installed in each block located by the main entrance to that part of the building or at secondary entrances to the main building. All fire panels should be interlinked within the same block.

Open protocol panels are often specified allowing landlords / contractors the option of specifying more than a single manufacturer's detector. They must be addressable in order that staff and the brigade can easily locate the area of activation. i.e. Fire Zone Area & the specific room or flat by the use of relay bases in the detector heads.

Break glass fire alarm points should be positioned at each exit point from a floor, (e.g. on stairwell landings) and at the exit points to the building. The alarm points should be positioned so as to be clearly visible and unobstructed.

5.0 Fire Safety Design & Specification Considerations – (cont'd)

5.0.4 Private Dwelling Flats (Apartments)

Within flats as a minimum, a mains operated smoke sensor (additionally supplied by an emergency standby power facility) should be located in the hallway of each flat (in accordance with **BS5839 part 6 LD3 grade 3**). These sensors should be interfaced with the warden call system such that the staff DECT telephone handsets indicate the incident address in the event of fire detector activation in a particular flat or other area.

The sensors within the flats should be complete with sounder bases which are normally required to deliver a minimum of 75dbA at the bed head through any closed door.

In addition, all apartment front entrance doors where provided with swing free door closers for ease of resident accessibility, must de-activate and self-close shut in the event of a fire alarm.

In flats the need for additional visual alarms will be determined by an assessment of individual resident needs as part of the ongoing review of the *'fire risk assessment'.* It is wise and economically prudent to install first fix wiring (utilising the fire alarm interface with the emergency alarm or warden call system) at building contract stage in order to facilitate future additional visual warning devices such as flashing beacons or vibrating pillows which may added on an 'as-needs' basis. These are normally supplied as part of the emergency or warden call assistive technology options.

Where not required by Building Controls, some landlords install a secondary detection system, in addition to the mandatory detection system, in rooms in resident's flats vulnerable to false alarms such as kitchens. Upon false alarm activation in that particular room, the call goes through the warden call DECT handset alerting staff who can talk to and reassure the resident whilst satisfying themselves that the incident is false following a personal visit to the flat, cancel the local alarm. These systems avoid alerting the adjacent residents initially and also have the added advantage that they pick up a potential incident much quicker than if a Building Regulation compliant system with smoke detector in the hallway only is fitted.

Again, exact details of the final configuration and layout must be agreed with Fire and Building Control Officers in order to facilitate the development of the Fire Management Strategy.

5.0.5 Fire detection and alarm apparatus together with 'cause and effect' – See Appendix

Upon activation of a fire alarm, whether by break glass or detector and dependent upon an alarm incident's location, a certain chain of events or 'cause and effect' is brought into play.

This 'cause and effect' being building specific, can vary from one extra care development to another however an indicative example typical of an installation in an Extra Care Housing scheme, is included within Appendix 1.

5.0 Fire Safety Design & Specification Considerations – (cont'd)

5.0.6 Fire suppression systems generally

Although not yet mandatory in Extra Care developments in England, certain fire engineered designs on larger developments may include the adoption of a fire suppression system as a cost effective and economical solution whilst integrating an improved level of fire safety. More than one large social housing and care landlord in the UK is now specifying fire suppression systems throughout their multi residential new-build care and Extra Care Housing developments.

Fire suppression in the UK has until recently, largely been installed in shops and commercial premises, retail buildings and new residential blocks over 30metres in height to comply with Approved Document B (ADB) with automatic water based sprinkler systems being the accepted installation. As increasingly more innovative designs evolve, especially as part of communal and public spaces in the larger scale Extra Care retirement village complexes, both water based sprinkler systems and low pressure water misting systems are now being considered by developers.

Some common misconceptions with answers *(A)* related to fire suppression systems are:

- Smoke sets them off –
    - *A. Only hot gases will actuate them.*
- When fire breaks out, the whole system is activated throughout the building. –
    - *A. the heat from a fire will only activate the nearest detector head with the water cooling the hot fire gas below. Only the minimum number of sprinklers necessary to quell the fire will operate should the fire spread further than can be contained by the first head.*
- The outlet heads can be damaged –
    - *A. they only actuate when hot gases activate a fusible link which releases a plate on the sprinkler head. They are extremely reliable and do not trigger accidentally.*
- They may leak –
    - *A. the heads and pipe work are pressure tested to 3 times that of the domestic plumbing system even though they only use normal pressure.*
- They are expensive and unaffordable. –
    - *The capital installation cost can be saved by a reduction in specification and design requirements when individual the building is 'fire engineered'. Costs in use are relatively low as checks are normally carried out as part of the regime of regular fire detection installation maintenance.*
- They are unattractive being unsuited to a domestic environment. –
    - *A. Unobtrusive designs are now available for the domestic market, appearing as flat plates on the ceiling which conceal the sprinkler head, these being almost invisible.*
- They cause a lot of water damage -
    - *A. They actually cause far less damage than fire fighters hoses as sprinklers control and stop a fire in the early development stage using approx 10-18 gallons per minute. Fire fighters hoses use 10 times that amount of water on what would be a much larger fire by the time they arrived.*

5.0 Fire Safety Design & Specification Considerations – (cont'd)

5.0.7 Water based sprinkler fire suppression systems

The DCLG's Fire Research Series paper 1/2010 carried out a '*Cost Benefit Analysis of Options to reduce the Risk of Fire and Rescue in Areas of New Build Homes'* with special reference to the Thames Gateway. The report considered whether or not the costs of both installing and maintaining sprinklers in domestic properties could be justified by the fire risk reduction that they would provide.

The report confirms that the direct life-cycle costs of residential sprinkler systems including initial installation and water supply costs, and ongoing inspection, maintenance and replacement costs were relatively acceptable. Indirect costs including property damage associated with false triggering were estimated to be very low.

Although the report did not support the mandatory installation of sprinklers in the Thames Gateway, the limited evidence suggested that sprinklers may be cost effective in social housing in certain cases. The report also stated that *"It may therefore be appropriate for providers of new social housing to consider sprinklers in a case-by-case basis".* This would also be true in the case of Extra Care Housing developments.

Design freedom and savings

The integration of sprinkler systems into larger Extra Care Housing developments can be expected to generate (indirect) cost savings as well as leading to more pleasing internal layouts through greater design freedoms due to a relaxation and/or reinterpretation of Building Regulations in relation to internal fire safety (as indicated earlier in this technical brief) and the more efficient use of land externally by allowing closer proximity distances. Smaller developments are unlikely to produce significant design freedom savings however.

In assisted living and housing communities in Scottsdale Arizona, the installation of sprinklers in new developments has reaped significant benefits in terms of an allowance for increased scheme densities and a doubling of fire hydrant spacing together with a relaxation in fire rating standards due to the effectiveness of sprinkler systems.

Specification cost considerations

In view of the possibility that the Building Regulations could be relaxed or reinterpreted as a result of the installation of a fire suppression system, the water supply pressures serving the sprinkler system must be adequate and comply with the requirements of **BS 9251:2005 *Sprinkler systems for residential and domestic occupancies (Code of practice)***.

The local water supply pressure will need to be verified for compliance with BS 9251:2005. However, it should be noted that mains water supplies may be interrupted, subject to pressure fluctuations, or for maintenance work. Designers should bear such possibilities in mind when specifying automatic fire sprinkler systems which are to be supplied directly with water from a service main.

Should the mains water supply pressure be inadequate, as may be the case in and around London, then a tanked and pumped supply will be required. This would therefore entail pump and tank maintenance to be factored into the costs-in-use calculations as well as space allocation within a plant room or roofspace.

Economies of scale indicate that the cost per unit falls for larger developments whilst requirements where a tanked and pumped supply is needed will cause the cost per unit to increase.

Due to stringent standards for fire sprinklers and their installation as required from British Automatic Fire Sprinkler Association (BAFSA) members, the fire insurance industry should offer significant premium discounts for premises protected by automatic fire sprinkler systems.

5.0 Fire Safety Design & Specification Considerations – (cont'd)

5.0.8 Fire Misting Systems

Misconceptions as noted earlier, are unfounded with current day water sprinkler installations, however with the advent of fire misting suppression systems, whilst they are not currently covered by a British Standard, there is a lot of positive evidence from Europe and the USA supporting their future adoption in the UK.

Some fire authorities are now beginning to accept their installation in the UK and hopefully it will only be a matter of time before they are more widely adopted across the country.

Water misting fire suppression systems:

In 2005 the Building Research Establishment (BRS) conducted a study for (the then) ODPM into *"Fire suppression in buildings using water mist, fog or similar systems"* summarising their findings as follows:-

- Over 1,000 water mist systems are installed in the UK, most of which were between 2003 and 2005, with a high concentration in one or two areas in domestic and residential premises. These comprised various types of water misting systems installed in a range of local and total compartment applications. ('*Total compartment'* is where water mist is designed to protect all hazards in a predefined room; '*Local application'* is where water mist is designed to discharge directly on an object or hazard such as over charging points in a dedicated buggy charging room). Water mist systems have been installed into all Approved Document B (Fire safety) purpose groups.

- The BRE found that the highest numbers were installed in dwelling houses followed by flats and maisonettes.

For the latest independent informed opinions for the most effective way of managing fire risks see the Spring 2010 BAFSA report *'Sprinklers for Safer Living – The benefits of automatic fire suppression systems in residential care premises' by ARUP Fire* – Many findings being equally applicable to multi-residential Extra Care Housing developments.

Whilst the Welsh Assembly in January 2010 voted unanimously in favour of the installation of sprinklers in new homes in Wales thereby protecting the most vulnerable members of the community, in October 2010 the proposal was dismissed by the Government in respect of making automatic sprinklers and fire suppression systems mandatory for all new homes in England. Currently they are only mandatory in the UK for buildings over 30m in height.

Clearly then there is some way to go in the demonstrating awareness and understanding of the positive benefits attached to the provision of fire suppression systems in housing across the whole of the UK. Some enlightened social housing landlords have however specified them for a while and are reaping positive benefits as described above in terms of design relaxations and cost effectiveness.

Retrofit fire suppression systems:

There are a few examples of low cost retrofit fire suppression systems available for installation in older properties being considered for upgrading to Extra Care Housing developments. These generally are localised fire mist suppression systems that for instance can utilise a replacement kitchen tap fitting in order to provide fire suppression covering a vulnerable room. The advantage of these systems is that they only require a conventional mains water supply together with an electrical connection for the sensor.

5.0 Fire Safety Design & Specification Considerations – (cont'd)

5.0.9 Catering Kitchen Fire Suppression Systems and Extract Ductwork

If a deep fat fryer or gas fired cooking range is specified in the catering kitchen consideration should be given to a suitable appliance-specific detection and wet chemical sprinkler system to the LPS1223 standard installed in the extract canopy above the cooking equipment.

To reduce the potential for fires in the extract ductwork, the fixed fire extinguishing system should be installed in conjunction with a grease filtration system meeting the requirements of *LPS 1263:Part 1: Fire Performance Requirements for Kitchen Extract Systems.*

Automatic systems which utilise specially designed nozzles, have been tested on real deep fat fryer fires by the Loss Prevention Certification Board LPCB to LPS1223 Requirements and testing procedures for approval of fixed fire extinguishing systems for catering equipment and have proved extremely effective. These systems use an alkaline wet chemical solution delivered through a piping network to a fine mist nozzle specifically designed and tested for a particular appliance, duct or plenum.

The system can be discharged either manually or automatically in response to a fire in the cooking hood. Automatic actuation is by thermal link detectors located behind the grease filters.

In commercial cooking operations, fryers and other appliances are often turned on early in order to have them heated and ready for cooking when needed. It is not uncommon for kitchen employees to leave the area and perform other tasks while the appliances warm up. Similarly, a cooking facility may be shut down without turning an appliance off or a fryer maybe left unattended. Fires can and, according to incident reports, do occur when fryers are left unattended and no-one is present to use extinguishers. Automatic systems do not rely on personnel being present in order to operate. Automatic suppression is equally applicable to vapour exhaust systems. Fires within these structures can occur unseen and are difficult to detect in their early stages. These particular fires are also difficult to extinguish without a fixed system since accessibility is a problem when using hand held extinguishers.

As well as fast and sure extinguishment of cooking fires, properly tested and regulated automatic systems bring with them an assurance that they will perform as intended in real fire conditions. To gain approval from testing houses such as the Loss Prevention Certification Board (LPCB) these systems are tested under extreme fire conditions. The combination of stringent testing, proven design, reliability and automatic discharge make a Wet Chemical Restaurant Fire Suppression System the best defence against fires in commercial cooking operations. Quick and effective extinguishment of these fires prevents personal injury, business interruption, equipment loss and structural damage to buildings.

5.0 Fire Safety Design & Specification Considerations – (cont'd)

5.0.10 Smoke control systems

Smoke control, by the adoption of automatic or manual opening vents is required in larger buildings to ensure:

- The unhindered evacuation of occupants and access for fire fighters by ensuring there is a clear and breathable air layer along and throughout protected escape routes
- The safety of occupants by avoiding smoke inhalation (the main cause of death in fires)
- The reduction of heat build up and potentially toxic gases which could lead to 'flashover' fires
- The protection of the structure from heat build up at higher levels
- The protection of property and furniture from damage

The smoke control design process involves several factors that will influence the system design:

- **Smoke buoyancy,** when the smoke initially rises due to having a lower density than the surrounding air, will need to be considered related to any horizontal barriers which will induce lateral smoke travel. The smoke, as it moves away from the source of the fire, will reduce in temperature entraining cooler air thereby becoming denser with a reduction in buoyancy.

- **'Stack effect'** when, with a low ambient air temperature, the air within a building being warmer and less dense, will always give rise to a higher level. This natural buoyancy is exaggerated in any vertical shaft within the building such as stairwells, open galleries and atria.

- **Wind effect** where external environmental factors such as neighbouring building heights and local terrain may influence the effectiveness of any smoke control ventilators. It is important to install the smoke ventilators in positions that are generally unaffected by prevailing wind conditions, however the wind direction not being constant will call upon the skill of fire engineers to include for alternative arrangements to cope with unusual conditions.

It must always be remembered that the design solution for each individual Extra Care Housing development needs to be appropriate to the scheme specific design risk and occupancy profile.

6.0 Management Legislation –

6.0.1 The Regulatory Reform (Fire Safety) Order 2005

The most important legislation related to the assessment of Fire Safety in multi residential buildings such as Extra Care Housing for older persons is *The Regulatory Reform (Fire Safety) Order 2005.*

The legislation, which applies across England and Wales, came in to force in October 2006 and replaced over 70 separate pieces of fire safety legislation.

Fire certificates are no longer issued and existing certificates are no longer valid.

The legislation applies to all buildings, places and structures other than individual private dwellings. In other words within a typical Extra Care Housing development, the legislation applies to all of the communal areas but not to the flats themselves.

The Regulatory Reform (Fire Safety) Order 2005 places the emphasis on risk reduction and fire prevention whilst making the employer, owner, or any other person who has control or operates any part of the Extra Care premises the *'responsible person'* in terms of compliance with fire safety law as they are best placed to address fire safety and ensure that risks – which necessarily change over time – are kept under review.

Duties imposed upon the *'responsible person'* under the legislation include the preparation of a *'fire risk assessment'* which may be drawn up by appointing one or more competent persons to assist with the task, however the *'responsible person'* remains responsible in law for complying with the order.

Following the preparation of a *'fire risk assessment'* the *'responsible person'* must implement the appropriate fire safety measures in order to minimise the risk to life from a potential fire and also to ensure that the assessment is kept up to date with regular reviews, say every quarter.

7.0 Fire Risk Assessments –

7.0.1 **A fire risk assessment** is an organized and methodical evaluation of the premises and the activities which take place within the premises.

The assessment should consider the likelihood of a fire starting and causing harm to those in and around the premises.

Additionally, as a 'live document' the '*fire risk assessment'* should identify the current precautions and regularly review the need for any additional precautions throughout the lifetime of the building – it is not a fire safety manual.

There are five key steps in developing a fire risk assessment:-

1. Identify fire hazards – (areas where fire could be expected to start - storage of flammable or combustible materials, resident's use of medical gases etc)
2. Consider the people who may be at risk – (vulnerable persons requiring care and assistance due to dementia, disability or infirmity, development of Personal Emergency Evacuation Plans (PEEP's), ensure records kept of overnight visitors to residents) – see Appendix 2 for further details.
3. Evaluate and act – (good housekeeping with clear escape routes and regular maintenance of fire detection installations and equipment, log books completed and reviewed etc)
4. Record, plan, instruct, inform and train – (regular fire alarm testing, evacuation plan procedure reviews, new staff induction training, resident's talks on actions if a fire is detected)
5. Review – (constantly update the documentation due to changes in resident's profiles and disabilities, differing uses of building such as implementation of a day centre with external users for example)

The fire risk assessment will assess the current suitability and sufficiency of:

a) Detection and warning
b) Fire-fighting provisions
c) Escape routes
d) Emergency escape lighting
e) Signs and notices
f) Management procedures
g) Inspection, testing, maintenance records

Every documented fire risk assessment should include an action plan with measures that will ensure that the fire risk is reduced to, or maintained at, an acceptable level.

Fire authorities are still the primary enforcing agency for all fire safety legislation and may carry out targeted or sampling inspections.

Central to the Regulatory Reform (Fire Safety) Order 2005 is the fire risk assessment and the Fire and Rescue Service (FRS) will expect to see one. Failure to maintain or provide a '*fire risk assessment'* renders the landlord, building owner or manager liable to the serving of an enforcement or prohibition notice by the FRS.

Enforcement notices are most often served for the following reasons:-

- Failure to undertake a fire risk assessment
- Failure to maintain emergency exit routes
- Inadequate maintenance (of fire safety facilities, equipment and devices)
- Inadequate staff training
- Inadequate record keeping

7.0 Fire Risk Assessments – (cont'd)

The DCLG have produced a series of detailed technical guides for ranges of specific types of premises, these being designed to help *'responsible persons'* understand the risk assessment process and provide advice on every aspect of fire safety (e.g. training, fire detection systems, emergency escape routes etc).

The technical guidance in respect of communal areas in block of flats and sheltered accommodation where care is not provided is covered by :- *DCLG Publications – Fire Safety Risk Assessment – Sleeping Accommodation.*

However, in Extra Care Housing where care is provided reference should be made to ***DCLG Publications – Fire Safety Risk Assessment – Residential Care*** where guidance on how to complete and what to include in fire risk assessments can be found in an informative and easy to understand document which is the cornerstone for good fire risk assessment management procedure.

Appendix 1 – Extra Care Fire Alarm Panel 'cause and effect' example.

A typical example of an Extra Care Fire Alarm Panel 'cause and effect' table is illustrated below.
(Not to be used as a generic solution)

Actions	**Indication on Fire Alarm Panel & all repeater panels**	**Evacuate Alarm sounders in specific area & alert to staff**	**Sounder in residents flats in specific fire alarm zone to activate**	**Release magnetic catches on all corridor doors hold open devices throughout building**	**Ensure fail safe release of all automated fire door actuators allowing manual operation**	**Ensure fail safe release of all external and main entrance doors on magnetic locks allowing manual operation**	**Activation of automatic smoke ventilation to zone or building generally**	**All lift cars to be sent to ground floor with doors open. Fire fighting lift to remain operational (where installed)**	**Off site autodialler to be put into standby or dial off site after pre determined period**
Activation of any Break Glass point	✓	✓	✓	✓	✓	✓	✓	✓	✓
Single Detector activation in communal or staff areas	✓	✓	✗	✓	✓	✓	✗	✗	✗
Single Detector activation within lobby area of flat	✓	✓	✗	✗	✗	✗	✗	✗	✓
Activation of two or more detection devices	✓	✓	✓	✓	✓	✓	✓	✓	✓
Single detector activation for longer than 4 minutes	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fault on loop powered device	✓	✗	✗	✗	✗	✗	✗	✗	✗

Appendix 2 – Extra Care Fire Risk Assessments – Help for People with Special Needs – an extract from HM Government's Fire Safety Risk Assessment

Help for people with special needs

By their nature, premises (such as Extra Care Housing) that provide care will often have residents who, in addition to being elderly, or in need of specialist care, will also have some other disability. The Disability Rights Commission estimates that 11 million people in this country have some form of disability. This may impact on their ability to leave a building speedily in the event of fire or make them entirely dependent on others to escape.

Some common forms of disability that you may need to take account of in your risk assessment include:

- mobility impairment, which can limit speed of evacuation;
- hearing impairment, which can limit the response to an alarm;
- visual impairment, which can limit the ability to escape; and
- learning difficulties, which can affect the response to an alarm.

As a person responsible for providing care services (in Extra Care Housing) you are likely to have considerable experience in assisting disabled people to move about. You should therefore carefully assess the practicalities of undertaking an emergency evacuation in the event of fire. If you have disabled employees you may also need to discuss their individual needs.

Under the *Disability Discrimination Act,* if disabled people could realistically expect to use the service you provide then you must anticipate any reasonable adjustments that would make it easier for that right to be exercised. Accordingly, if disabled people are going to be in your premises then you must also provide a safe means for them to leave if a fire occurs.

The Disability Discrimination Act includes the concept of 'reasonable adjustments' and this can be carried over into fire safety law. It can mean different things in different circumstances. For example, in a small children's home it may be considered reasonable to provide contrasting colours on a handrail to help those with vision impairment to follow an escape route more easily. However, it might be unreasonable to expect that same home to install an expensive voice alarm system. Appropriate 'reasonable adjustments' for a large business or organisation may be much more significant. In premises with many severely disabled residents, you may also wish to contact a professional access consultant or take advice from disability organisations.

Whilst many people with special needs wish to and are able to facilitate their own escape, there may be a significant number of people in premises that provide care (such as Extra Care Housing) who are severely disabled and only able to move or react adequately with assistance from carers or staff. These will include residents who are confined to bed and receiving medical interventions by way of attached medical devices.

You may conclude that the current levels of assistance available in your premises, and the layout and construction means that the evacuation of some people (most likely residents) cannot be guaranteed within an acceptable time. You will then need to consider some additional method of ensuring their safety (e.g. an automatic fire suppression system). This is a prime example of the necessity to carry out ongoing *fire risk assessments* as the age profile of residents, and by implication their disability levels, of a typical Extra Care scheme gets older. In such cases you should seek specialist advice from a competent person.

Where people with special needs (residents, employees and visitors) are accommodated, work in, or use the premises, their needs should, so far as is practicable, be discussed with them. These will often be modest and may require only changes or modifications to existing procedures. However, in some cases, more individual arrangements involving the development of 'personal emergency evacuation plans' (PEEPs) may need to be considered. Any PEEP developed for residents may need to be incorporated into the individuals care plan.

Guidance on removing barriers to the everyday needs of disabled people is contained in BS 830014. Much of this advice will also assist disabled people during an evacuation. You should ensure that your emergency plan has a record of where disabled people are located in the building and includes a plan of action to assist them in the event of a fire.

Further advice can be obtained from the Disability Rights Commission at www.drc-gb.org.

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1.0 Recent Fire Statistics

Fire statistics Monitor Report (April 2009 to March 2010)

2.0 Construction Fire Safety

HSG168 (Second edition, published 2010) '*Fire Safety in Construction*'

The Construction Confederation and Fire Protection Association in May 2009, published *Fire Prevention on Construction Sites*- Joint Code of Practice, 7th edition,

3.0 Timber Frame Buildings

The Fire Statistics Monitor – April 2009 to March 2010 in an *Analysis of Fires in Timber Framed Buildings* Not Under Construction

UK Timber Frame Association & Fire Protection Association Guidance UKTFA - 'SiteSafe'

4.0 Fire Safety Design Legislation

See website:-
www.communities.gov.uk/firesafety

"LACoRS Housing – Fire Safety (guidance on fire safety provisions for certain types of existing housing)", PAS 79:2007 and Approved Document B. An understanding of the risk assessment methodology is an essential requirement of anybody having a responsibility for housing.

Building Regulations Approved Document B (ADB).

BS 9999 'The Code of Practice for Fire Safety in the Design, Management and Use of Buildings'

BS 7974:2001 'Application of Fire Safety Engineering Principles to the Design of Buildings Code of Practice'

The Chartered Institution of Building Services Engineers (CIBSE) has issued a new third edition of its Guide E: *Fire safety engineering* . The third edtion of the Chartered Institute of Building Services Engineering guide gives useful advice on fire safety engineering and includes new chapters covering performance-based design principles and the application of risk assessment.

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5.0 Fire Safety Design & Specification Considerations

BS5839 parts 1 and 6 Fire detection and fire alarm systems for buildings, BS5839 part 1 category L3 (for ancillary areas) and L5 (in common apartment areas)

BS5839 part 6 LD3 grade 3

DCLG's Fire Research Series paper 1/2010 carried out a '*Cost Benefit Analysis of Options to reduce the Risk of Fire and Rescue in Areas of New Build Homes'*

BS 9251:2005 *Sprinkler systems for residential and domestic occupancies (Code of practice)*.

2005 the Building Research Establishment (BRS) conducted a study for (the then) ODPM into *"Fire suppression in buildings using water mist, fog or similar systems"*

Spring 2010 BAFSA report *'Sprinklers for Safer Living – The benefits of automatic fire suppression systems in residential care premises' by ARUP Fire*

See website:-

http://www.info4fire.com/news-content/full/welsh-assembly-votes-for-mandatory-sprinklers-in-new-homes

LPS 1263:Part 1: Fire Performance Requirements for Kitchen Extract Systems.

6.0 Management Legislation

DCLG Publications – Regulatory Reform (Fire Safety) Order 2005 – "A short guide to making your premises safe from fire"

7.0 Fire Risk Assessments

DCLG Publications – Fire Safety Risk Assessment – Sleeping Accommodation – this covers the communal areas of flats and sheltered accommodation where care is not provided.(where care is provided see residential care guide)

DCLG Publications – Fire Safety Risk Assessment – Residential care Premises – this covers buildings where the main use id the provision of residential care (where the primary purpose is to provide personal and or nursing care). This guide may also be suitable for individual residential care premises that are part of other multi-use complexes, although consultation with other people responsible will
be necessary as part of an integrated risk assessment for the complex. The relevant parts of this guide can also be used as a basis for fire risk assessment in premiseswhere care is provided on a non-residential basis, e.g. day care centres.

Nottinghamshire & City of Nottingham Fire Authority – Fire Risk Assessment Information and Guidance

Edited by Jeremy Porteus, Housing Learning and Improvement Network.

For further information about the Housing LIN and to access its comprehensive list of on-line resources, visit www.dhcarenetworks.org.uk/housing

The Housing LIN welcomes contributions on a range of issues pertinent to Extra Care housing. If there is a subject that you feel should be addressed, please contact us.

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