Surrey Fire and Rescue Service
Keeping YOU safe from fire!

Fire Sprinkler in Residential Care Business Plan

Draft for Consultation

Guidance
Risk Assessment
Prevention
Protection For
Adults at Risk

www.surreycc.gov.uk
Making Surrey a better place

Independence for you, peace of mind for your family

You Surrey Telecare service, ensuring help is there when needed

FIRE KILLS YOU CAN PREVENT IT
## Contents

<table>
<thead>
<tr>
<th>Contents</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td>Identification of Persons whose circumstances make them vulnerable</td>
<td></td>
</tr>
<tr>
<td>What is Available?</td>
<td></td>
</tr>
<tr>
<td>Emergency deployment of portable mist suppression cover</td>
<td></td>
</tr>
<tr>
<td>Audit trail</td>
<td></td>
</tr>
<tr>
<td>Fire Suppression Risk Matrix</td>
<td></td>
</tr>
<tr>
<td>Referral process</td>
<td></td>
</tr>
<tr>
<td>The ‘aqua-mist’ portable mist suppression system</td>
<td>Appendix 1</td>
</tr>
<tr>
<td>Information gathering</td>
<td>Appendix 2</td>
</tr>
<tr>
<td>Case studies</td>
<td>Appendix 3</td>
</tr>
</tbody>
</table>
Introduction

Surrey Fire and Rescue Service (SFRS) is committed to saving life and protecting property through the application of sprinklers and other water suppression systems.

SFRS strongly advocates the use of Automatic Water Suppression Systems (AWSS) in potentially all premises for:

• The protection of life.
• To protect property, heritage and the environment.
• To sustain business continuity.

SFRS are promoting the use of sprinklers in our communities, these include:

• The legal requirement to fit sprinklers in schools and other education establishments.
• To widen the use of sprinklers in residential care facilities
• To widen the use of sprinklers and misting systems in the protection of vulnerable people.
• To widen the use of sprinklers and other water suppression systems in domestic properties.
• To support the development and application of low cost sprinklers in domestic properties.
• To secure the use of water suppression systems in any property, which would save life, permit design freedoms and encourage innovative modern architecture.
• To support and work in partnership with all stakeholders from within the water suppression industry towards the combined vision of wider use of water suppression systems in our society.

Fire and Rescue Services are engaging with an unprecedented range of legislative change, which has as its very core a risk based approach to the delivery of our preventative, protective and response services.

The business case is compelling, water suppression systems save life, reduce injuries, protect any property and sustains businesses all at a competitive and potentially reduced cost.

This document looks in depth at the business case for the use of water suppression systems in all types of residential care homes.
Fire in Care Homes: a problem

Fires in care homes, especially those catering for the elderly and infirm, present their own serious hazards – particularly at night – as the residents may be unable to leave safety without assistance or they may be immobile as a result of disability, mental capacity or medication.

There have been a number of serious fires in care homes in many parts of the world resulting in multiple deaths. Even the UK with its strict fire regulations has not been immune.

Each year there are around 800 fires in homes providing care for older persons in the UK. On average, three people die each year and a further 84 are injured. In the worst incident for many years, in 2004, one modern care home in Scotland suffered 14 deaths in a fire. (There are around 350 fires in children’s homes with two or three fatalities and around 650 fires in psychiatric hospitals every year).

Apart from the human tragedy that results from death and injuries there are significant losses in respect of property damage. Major fires often result in businesses closing for good, as they never recover. Even where a home is not destroyed there can be significant commercial pressures on the owners and operators resulting from the need to provide alternative accommodation.

There are many indirect costs when a fire occurs in your residential care home including:

- Loss of sleeping, communal and housekeeping facilities.
- Disruption to daily life.
- Possible increase in insurance premiums.
- Loss of data and IT systems - records and personal information.
- Loss of employment if the premises do not reopen.
- Loss if residents’ personal possessions.
- Loss of a place called home.
- Bad publicity leading to loss of revenue.
- Corporate liability leading to prosecution.

On top of this is immeasurable emotional damage, disruption of basic living and loss of confidence in the owners and operators.

Legal Responsibility

The Regulatory Reform (Fire Safety Order) 2005 which covers all workplaces, including care and nursing homes in England and Wales came into force on 6 October 2006. This legislation has put the emphasis on preventing fires and reducing risk, and makes it the responsibility of managers and owners to ensure that no one is ever injured or killed in a fire.
Fire in Care Homes: Why it all goes wrong?
In looking at recent care home fire were people have injured or killed we can look at a number of reasons for why is all goes wrong.

Why fire occurs in a care home?
In short it is because of people and the equipment people need when they occupy a building, let assume we build a new care home and it is hand over to the owner as an empty building, it with the electric switch in the off position.

Ask the question – at this moment in time how does a fire occur? The answer is that you need a lighting strike or an arsonist.

It is only when we turn on the electricity, filling the building with electrical equipment, cooking equipment and then move in the staff and the residences that we greatly increase the risk of fire:
• Kitchen fires
• Electrical equipment faults
• Incorrect use of electrical equipment
• Smoking
• Arson
Are the main causes of fires in a care home.

But we have the latest fire protection I hear you shout
Yes you are correct it is a new building with a fire alarm, self closure on doors, intumition strips and smoke seals on doors, fire extinguishers the list goes on.

But we carry out fire risk assessments I hear you shout
Yes you do – you indentify the ignition sources and combustible material (the Hazards), you plan to keep them apart, you plan for evacuation if there is a fire and you train your staff in fire safety.

I do everything the law requires I hear you shout
Yes you do and you even have a letter from the fire service saying that you comply.

So if you have a fire why did it all go wrong?
The answer is simple – people (staff and residents). The one reason you are in business as a care home is why it can all go wrong. These issues include:
• People wedge open fire door because they heavy and get in the way or block automatic closing door so that to not close in a fire
• People store combustible material next to ignition sources
• Staff don’t do what the training said they should because they panic
• Staff don’t do what the training said they should because they did not understand the training
• Staff use the wrong fire extinguisher and make the situation worse
• Staff focus on the fire and not on the evacuation of residences
• Care managers do not manage the emergency situation effectely
• Your staff are professional carers not professional firefighters
• Your residents may have disabilities that mean that they react against normal expectations
What is the solution?

As this document has highlighted it is the people that are the problem, so as far as possible we need to remove them from the area where they cause a problem and allow them to do their job of caring for the residences. We need to remove them from the need to:

- Extinguish the fire
- Ensure all the door are closed to stop the spread of fire and smoke
- Carry out difficult and confusing evacuation of the residences
- Raise the alarm and call the fire service

In addition to the above we need to protect:
- Your building
- Your business
- Your staff
- Your clients
- Your personal and corporate liability
- Your corporate identity in the market place

The solution to all these issues is the fitting and use of a fire sprinkler system in your residential care home.

Fire Sprinklers – some facts

- Losses from fires in buildings fitted with sprinklers are one-tenth of those in unprotected buildings.

- In residential buildings protected by sprinklers 99% of fires are controlled by sprinklers alone; 80% of fires are controlled by the operation of fewer than six sprinkler heads.

- The chance of a sprinkler going off accidental is thought to be less that 1 in 10 million. No risk of the use a toaster setting off a sprinkler system!

- The average maintenance cost for a sprinkler system is around £800 per year.

- Sprinkler systems have a very long service life – up to 50 years.

- Sprinkler in care homes discharge significantly less than 5% of the water that would be used by the fire service, so considerably reducing water damage.
Benefits of fire sprinklers

Research by the Building Research Establishment (Effectiveness of Sprinklers in Residential Premises BRE report 204505 and the March 2012 Cost Benefit Analysis of Residential Sprinklers BRE report 264277) has shown that there are sound and financial benefits to the installation of fire sprinklers. There benefits include:

- Fire Sprinklers can be used as a tool to overcome structural fire protection difficulties: for example, it can be cheaper to install sprinklers rather than to install extensive physical fire separation and compartmentation.

- Evacuation procedures can be difficult and confusing: a sprinkler system will contain a fire and so make for simpler, small scale evacuations.

- Older people can have difficulties in opening doors, a sprinkler installation will allow for relaxation on both the number and cost of self-closing doors.

- Sprinklers remove large volumes of the dangerous gases from smoke and reduce the impact of choking and toxic smoke.

- When staff numbers are limited, as is often the case at night, the presence of sprinklers allows valuable time for full assessment of risk and evaluation of next steps.

- Installation of sprinklers means that staff can concentrate on theirs residents’ welfare rather than dealing with the fire itself.

- With sprinklers it may be possible to reduce the extent and quantity of other fire safety equipment.

- Inclusion of a sprinkler system within the package of fire protection measures gives confidence to both clients and their families.

- Wouldn’t it offer an advantage in advertising to tell prospective residents that a property contains the most effective fire safety measures available?

- Incorporating fire sprinklers into fire protection measures help to provide a safe, worry-free environment for residents and staff alike.

- Insurance premiums and excess figure may be significantly reduced by insurers.

Automatic fire sprinklers are the common-sense approach to avoiding the problems and costs of a fire, and in fact the latest government guidance recommends installation of sprinklers and in Scotland it is now the law.
The business case and plan for fire sprinklers in residential care premises

The business case for the use of fire sprinklers will differ around a number of factors including:

- A new build premises allows for the fire sprinklers to be part of the original building and should be a cheaper capital cost.
- An older building would require a retrofit system but there may be more trade-offs available with the building requiring upgrading of fire safety measures.
- The level of current fire protection in the premises.
- The size of the premises.
- The trade-offs available by the fitting of fire sprinklers.

The owners of residential care homes will need to individually assess their premises, cost of the fire sprinklers system and the saving shown by the project.

Trade-offs

Trade-offs could be seen as a relaxing of or a reduction in the required fire safety and management that can come from the fitting of fire sprinklers. Not all trade-offs detailed below will be available to every owner due to individual need and circumstances.

Some of these trade-offs will mean that there is a reduction in capital funding that could be put towards the capital funding of the fire sprinklers or the fire sprinkler system may be cheaper that the planned other requirements and other will show a reduction in operating costs that will show a year on year saving once the fire sprinkler system has been paid off.

For a full list of trade-offs for new build residential care buildings please see the Surrey Fire and Rescue Service guide to Automatic Water Suppression Systems.
Below is a list of common trade-offs for excising residential care buildings and management:

<table>
<thead>
<tr>
<th>Trade Off that may be available</th>
<th>Discussion points and potential savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consideration to relaxing the requirement for fire resisting doors</td>
<td>Allowing a non-rated fire door to be fitted in situations where a fire door would normally be required. BRE research highlighted the importance of fire separation afforded by doors and walls in maintaining escape routes clear of smoke. Therefore, it may be acceptable to relax the need for fire resisting doors in certain areas. However, doors and associated partitioning should remain in place, where necessary, and be such that they are of suitable construction and integrity to enable escape routes to be safely used during the evacuation period.</td>
</tr>
<tr>
<td></td>
<td>Saving – capital cost reduction on replacement of existing doors or maintenance cost if repairs are need for doors.</td>
</tr>
<tr>
<td>Relax the need for Intumescent seals on fire doors</td>
<td>As research has demonstrated that AWSS limit room temperatures below that required to activate these seals. Smoke seals and self-closing devices should be fitted where there is a requirement to do so.</td>
</tr>
<tr>
<td></td>
<td>Saving – Capital cost saving if they are required and not fitted, maintenance cost saving if they are fitted.</td>
</tr>
<tr>
<td>Consideration to relaxing or reducing the provision of fire fighting equipment</td>
<td>Subject to the findings of the fire risk assessment. Consideration could be given to occupancy profile, fire/evacuation strategy and AWSS operating characteristics.</td>
</tr>
<tr>
<td></td>
<td>Saving – Ongoing of fire extinguisher purchase and services costs; in some cases this could be removed completely.</td>
</tr>
<tr>
<td>Staffing numbers</td>
<td>Due to the reduced need to evacuate the home in the event of a fire, it may be possible to reduce especially night time staff to the level required by CQC for care.</td>
</tr>
<tr>
<td></td>
<td>Saving – Ongoing reduction in staff expenditure</td>
</tr>
<tr>
<td>Staff training</td>
<td>Without the need to evacuate the building and the need to use fire extinguisher staff training could be reduced in terms of input and time spent</td>
</tr>
<tr>
<td></td>
<td>Saving – Ongoing reduction in staff training and the time of staff spent away from the workplace doing the training.</td>
</tr>
</tbody>
</table>
Examples of Business plan

All costing used for the examples are not to be use in any actual business plan as they are only provided for illustration.

Example 1
The residential care home meets all relevant fire requirements with the fire doors including Intumescent and smoke seals with no improvements required.

It is a large home that requires 2 additional staff on duty at night for evacuation of the home.

At present the home as fire extinguishers and a maintenance contacting costing £400.00 per year

Business Plan

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
<th>Saving</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Sprinklers System (Capital)</td>
<td>£45,000</td>
<td></td>
<td>£45,000</td>
</tr>
<tr>
<td>Fire Sprinklers System Maintenance (ongoing)</td>
<td>£800.00 / year</td>
<td></td>
<td>£800.00 / year</td>
</tr>
<tr>
<td>Reduction in night staff x 2</td>
<td>£30,000 / year</td>
<td></td>
<td>£30,000 / year</td>
</tr>
<tr>
<td>Reduction in fire extinguisher maintenance contact</td>
<td>£400 / year</td>
<td></td>
<td>£400 / year</td>
</tr>
<tr>
<td>Year on year reduction</td>
<td>£29600</td>
<td></td>
<td>£29,600 / year</td>
</tr>
<tr>
<td>Number of years to pay for Fire Sprinklers System</td>
<td>£45,000 divided by £29,600 = 1.52</td>
<td></td>
<td>1 year and 6 months</td>
</tr>
<tr>
<td>Yearly saving after 1 year 6 months</td>
<td></td>
<td></td>
<td>£29,600 / year</td>
</tr>
<tr>
<td>Total saving over life of sprinkler system at 50 years</td>
<td>£29,600 for 48 years and 4 months</td>
<td></td>
<td>£1,430,666.00</td>
</tr>
</tbody>
</table>
Example 2
The residential care home requires Intumescent strips on 40 doors to meet the relevant fire requirements. This work has been budgeted for as a capital expenditure.

The home requires 1 additional staff on duty at night for evacuation of the home.

At present the home as fire extinguishers and a maintenance contacting costing £400.00 per year.

Business Plan

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
<th>Saving</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire Sprinklers System (Capital)</td>
<td>£45,000</td>
<td></td>
<td>£45,000</td>
</tr>
<tr>
<td>Intumescent strip not now required (Capital cost saving of £100/door)</td>
<td></td>
<td>£4,000</td>
<td>£4,000</td>
</tr>
<tr>
<td>Capital required</td>
<td></td>
<td></td>
<td>£41,000</td>
</tr>
<tr>
<td>Fire Sprinklers System Maintenance (ongoing)</td>
<td>£800.00 / year</td>
<td></td>
<td>£800.00 / year</td>
</tr>
<tr>
<td>Reduction in night staff x 1</td>
<td>£15,000 / year</td>
<td></td>
<td>£15,000 / year</td>
</tr>
<tr>
<td>Reduction in fire extinguisher maintenance contact</td>
<td>£400 / year</td>
<td></td>
<td>£400 / year</td>
</tr>
<tr>
<td>Year on year reduction</td>
<td>£14,600</td>
<td></td>
<td>£14,600 / year</td>
</tr>
<tr>
<td>Number of years to pay for Fire Sprinklers System</td>
<td>£41,000 divided by £14,600 = 2.80</td>
<td></td>
<td>2 year and 11 months</td>
</tr>
<tr>
<td>Yearly saving after 2 year 11 months</td>
<td></td>
<td></td>
<td>£14,600 / year</td>
</tr>
<tr>
<td>Total saving over life of sprinkler system at 50 years</td>
<td>£14,600 for 47 years and 1 months</td>
<td></td>
<td>£687,416.00</td>
</tr>
</tbody>
</table>
Business plan

To aid with the production of a business plan two prices are required from sprinkler installer:

1. The cost of the installation of a BS 9251: 2005 fire sprinkler system
2. The yearly cost of the maintainance of the fire sprinkler system