

# Sprinkler & Automatic Suppression Policy

Standard Operating Procedure No. TFS - 003

## Document Overview: -

It is Wiltshire Fire and Rescue's (Wiltshire FRS) policy to encourage and promote the installation of sprinklers in education, commercial, residential and domestic premises or as part of an engineered solution. The follow guidelines should be used to support these aims.

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## **Sprinkler & Automatic Suppression Policy – Key Information**

1. IT IS A KEY OBJECTIVE OF THE SERVICE TO PROMOTE FIRE SUPPRESSION SYSTEMS IN APPROPRIATE APPLICATIONS AND TO ALLOW RELAXATIONS OF PRESCRIPTIVE STANDARDS WHERE RECOGNISED AND APPROPRIATE.
2. The Wiltshire FRS SPRINKLER TEAM UNDER THE DIRECTION OF THE SERVICE SPRINKLER OFFICER WILL DELIVER THE OBJECTIVES OF THE SERVICE.
3. AS A GENERAL RULE SPRINKLERS SHOULD ALWAYS BE FITTED TO A RECOGNISED STANDARD IE BS EN 12845, NFPA STANDARDS OR BS9521/BS9522.
4. PARTIAL INSTALLATION OF FIRE SUPPRESSION SYSTEMS SHOULD ALWAYS BE AVOIDED UNLESS SUPPORTED BY RECOGNISED CODES OF PRACTICE.

## **Sprinkler & Automatic Suppression Policy - Primary**

### **1.0 WILTSHIRE FRS STRATEGIC AIM**

Wiltshire and Swindon Fire Authority, in line with the Wiltshire FRS Integrated Risk Management Plan, will endeavour to encourage and promote installation of sprinklers in education, commercial, residential and domestic premises as part of an engineered solution.

The 'trade up' to sprinklers may be a compensatory feature over specified/recognised guidance documents, in consultation with the relevant enforcing bodies and stakeholders.

### **2.0 METHODOLOGY OF POLICY SUPPORT**

This policy will be supported by the following infrastructure

#### Nominated Wiltshire FRS Sprinkler Officer

This will be a suitably qualified Community Safety Inspecting Officer who will act as lead officer for the Wiltshire FRS Sprinkler Group and will act as appoint of information and advice to the chief Fire Officer, internal staff and external organisations.

#### Wiltshire FRS Sprinkler Team (to be formed summer 2005)

The Wiltshire FRS Sprinkler Team will be formed from members of staff from each group community safety office and will work towards a coherent and co-ordinated strategy to encourage, promote and provide advice for commercial and residential sprinklers.

#### Wiltshire FRS Sprinkler Information Pack

The BST will produce and periodically review, an information pack for commercial and residential sprinklers to provide information and advice for those who may be considering providing sprinklers in a project.

#### Support of Wiltshire Group of Local Authority Building Control Bodies and other Partner

The BST will seek to agree and maintain a memorandum of understanding with Local Authority Building Control and other partners, on the promotion of sprinklers and the potential for design relaxations.

#### Development Control

Each community safety group as part of their programme of development control will seek out opportunities to promote and encourage the use of sprinklers through

lobbying via standard letters and presentations to developers and architects, etc on the benefits of these systems.

#### Supporting of Industry Groups and Other Sprinkler Representative Bodies

Wiltshire FRS will continue to support the activities of such organisations as BASA, FSA and the NFSN in their activities in promoting sprinklers. The BST, wherever possible, will provide representation of the Service at meetings and conferences. Also the Lead officer will provide information on the progress of installations in Wiltshire and successful sprinkler stops so that the information can be used for positive publicity.

#### Sprinkler demonstration facility, Westlea

The sprinkler demonstration facility at Westlea will be utilised wherever possible, in co-operation with the Station Commander, to promote the effectiveness of sprinklers by graphic demonstration.

#### Wiltshire FRS assisted installations

The ODPM has provided central funding for provision of smoke detection and fire suppression systems. The BST, in partnership with other Authorities, will seek out those who are particularly vulnerable from fire. If appropriate and justified through assessment of risk (in partnership) Wiltshire FRS may provide full or part funding of such a suitable system as to lower the risk to individual(s) to an acceptable level.

Any such provision should come with a written undertaking from the partner authority that the system will be serviced in accordance with the relative standard.

### **3.0 POTENTIAL RELAXATIONS FOR RESIDENTIAL SPRINKLERS IN APPROVED DOCUMENT "B" OF THE BUILDING REGULATIONS**

In 2001, some 3,500 sprinkler systems were installed throughout the UK in compliance with BS DD251. Some were in buildings where the guidance of ADB was fully met, but many were installed to provide alternative means of protection to some aspect of ADB recommendations.

In the latter cases, Building Control officers – guided by the Fire Service, judged that the protection afforded was at least equivalent to that of ADB. A few cases have been brought to the Building Regulations unit of the DTLR (now ODPM). One of these used a fire engineering approach to compliance with ADB, which was accepted, although the use of the specific type of sprinkler was disputed.

Examples of types of applications accepted by various building control officers are given below.

#### In Lieu of Traditional Escapes

Change of use from pumping station to single private dwelling; residential sprinklers installed due to open plan design not conforming to ADB. (Kent)  
Wiltshire FRS access limitations

Infill developments of houses and blocks of flats, where the access widths and turning areas and for appliances does not meet ADB recommendations, and where cul-de-sacs of excessive lengths. Developments allowed where sprinkler protection provided to BS 9251.

### Alternative means of Escape

Recommendation for a second means of escape waived where occupied space at height of over 7.5m. Unusual example of a seven-storey high lighthouse conversion (Burnham on Sea). Also where provision of external staircase not possible, or not desirable, for instance for security reasons. (Women's refuge, Oxford). Where four storey town houses depend upon single stairway for egress (Lancaster).

### Passive Requirements for Typical Loft Conversions

Where new floor formed at more than 4.5m above ground level. Sprinkler protection viable alternative (East Herts and several others). No need, for instance, to upgrade floor to 30-minute fire resistance where sprinklers provided.

### In lieu of traditional escape routes

Conversion to private flats. (Avon)

### Fire Resistance Requirements

Relaxation of 30-minute fire resistance for walls, floors and door. (However, all must be of sound construction.) Herts, HMO refurbishment.

### Open Stairways

Stairways open to ground floor lounge area from new second floor accommodation – acceptable with sprinkler protection. DTLR. Determination

### Travel Distance

Travel distance in bed-sit or open plan apartments. Current limit 9m, extended to 18m where sprinklers installed.

### Inner Rooms

Acceptable for inner rooms to open into an open plan living space where sprinklers installed.

### Internal Protected Corridors or Hallways

Currently restricted to 9m in length, extend to 18m where sprinklers installed.

### Heat Detectors

Relaxation of requirements for heat detectors in bedrooms/bed-sits with cooking facilities, and in kitchens. Herts.

### Compartmentation between Different Purpose Groups

Reduced levels of fire resistance between different purpose groups (e.g., shops with flats above) provided whole building sprinkler protected.

### Internal Linings

Relaxation for common areas and escape routes.

### Fire Fighting Equipment

Relaxation for fire extinguishers, but not fire blankets where required in bed sits.

### Intumescent Door Seals

Relaxation on need to provide intumescent door seals for doors leading to escape routes.

Where sprinklers are installed in buildings in strict compliance to BS9251, most of the requirements of Approved Document B will be fully met, and sprinklers will provide dramatically improved life safety protection.

In many cases the use of sprinkler systems designed and installed to BS9251:2004 will actually provide a higher level of life safety in the event of a fire, than would strict adherence to Approved Document B.

### Partial Systems

**Partial installations should generally not be accepted.** They are not supported by BS9521. There is always the danger that a fire could occur elsewhere in a partially sprinklered building, which could be outside of the design parameters of the system. This would lead to system failure and could ultimately lead to injury or loss of life.

## **4.0 DESIGN FREEDOMS IN HOUSES IN MULTIPLE OCCUPATION WHEN UTILISING RESIDENTIAL SPRINKLERS**

These are for existing 1, 2 and 3 storey premises. Cellars/basements do not count as a storey providing they are non-habitable rooms i.e. storage only. Design freedoms for premises of 4 storeys and above will be much more limited and determined by the enforcing authority on an individual basis.

Relaxation of the requirement for periods of 30-minute fire resistance for walls, floors and doors. However, all doors, floors, walls and partitions must be of sound

construction, integrity and maintained in good condition so that escape routes can be safely used during the evacuation period. This is to ensure escape routes are not compromised by smoke, which may still issue from a sprinklered controlled fire.

Any glazing between habitable rooms and the stair enclosure (excluding glazing to a bathroom or wc) should be fire-resisting and retained by a suitable glazing system and beads compatible with the type of glass.

Under-stair cupboards used for storage must be either sprinklered or upgraded to a fire-resisting standard.

In larger buildings where alternative escape routes/stairways are necessary, the common corridor should be sub-divided by a self-closing fire door and associated fire resisting construction so that smoke will not affect access to more than one escape route.

Except for kitchens, all habitable rooms in the upper storey(s) served by only one stair should be provided with a window (or external door) which is available and suitable for emergency egress.

A relaxation of the requirement for intumescent seals on doors leading onto escape routes may be allowed. However, doors leading onto escape routes will still require close fitting smoke seals and overhead self-closing devices (conforming to BS EN 1154 : 1997).

Relaxation of the requirement for a BS 5839 Pt.1: L2 fire warning system. The fire alarm system must conform to the requirements of British Standard 5839: Part 6: 2004, Grade D, type LD2 system. Smoke detectors of the optical type should be provided in the common areas on all floor levels. Audibility levels of 75 dB(A) should be achieved at all bed heads with the bed-sit doors closed (sounders positioned in the common areas producing approximately 100 dB(A) should be capable of producing this sound level at the bed head as bedroom doors attenuate sound by approximately 20 dB(A)). Detectors should be interlinked and hard wired into a dedicated circuit at the dwellings main distribution board, which is under the control of the landlord (not part of any 'pay' meter circuit).

A relaxation of the requirement for heat detectors in bedrooms/bed-sits with cooking facilities may be allowed. As sprinkler heads have an effective heat-sensing element, it is not necessary to provide a fire alarm heat detector. However, each bedroom/bed-sit (regardless of whether or not they have cooking facilities) should be provided with a non-interlinked optical type smoke detector, which conforms to British standard 5446: part 1 and has a 'hush' type facility. These detectors should have an integral standby supply (battery back up) and be hard wired into a dedicated circuit at the dwellings main distribution board, which is under the control of the landlord (not part of the tenants electric meter/pay system). To avoid false alarms causing a disturbance and nuisance to other tenants, smoke detectors within bedrooms/bed-sits should be standalone, single point detectors i.e. non-interlinked.

Relaxation of the requirement for heat detectors in kitchens. As sprinkler heads have an effective heat-sensing element, it is not necessary to duplicate this with a fire alarm heat detector (smoke detectors are also not required in kitchens as they would generate a high incidence of false alarms).

Relaxation of the requirement for compartmentation between different Purpose Groups. Reduced levels of fire resistance between different Purpose Groups may be allowed providing the whole building is sprinklered to the appropriate standard.

Relaxation of the requirement for internal fire spread (linings). Common areas and escape routes must have a minimum class 1 classification (European Standard class C). All other areas must have a minimum class 3 classification (European Standard class D).

Relaxation of the requirement for fire fighting equipment. Portable fire extinguishers will not normally be required. However, bed-sits with cooking facilities and kitchen areas should be provided with a fire blanket (conforming to BSEN 1869).

## **5.0 QUALIFYING CONDITIONS FOR DESIGN FREEDOMS**

Design and installation of the sprinkler system must be carried out by experienced sprinkler contractors who are suitably qualified and registered with the Residential Sprinkler Association. Alternatively installers may be certificated under the LPS 1048 Scheme Requirements for Certificated Sprinkler Installers, Supervising Bodies and Supervised Installers providing they are able to demonstrate competence for installation of Residential Sprinkler systems.

The sprinkler system must be designed, installed and maintained in accordance with British Standard 9251: 2004 or other equivalent internationally recognised standards which are approved by the enforcing authority. Sprinkler systems designed for use in HMO's should be of the residential type. Additional requirements, clarification or deviations from BS9251 are detailed below (with reference made to the BS9251 clause where appropriate):

Sprinkler heads must have a quick response thermal sensitivity rating, be of the residential pattern type and conform to BS9252 or UL1626. Concealed and recessed sprinkler heads are acceptable to the enforcing authority.

Where frost protection is necessary, the enforcing authority will not normally allow antifreeze or other system additives as this is likely to cause a loss of pressure and flow due to the requirement for a second check valve to be fitted (Water Regulations: Fluid Category 3 risk).

Consultation and approval from the water authority will be required for sprinkler installations and where it is necessary to install a larger diameter incoming cold water main in order to achieve the required sprinkler flow rates. During this consultation the opportunity should be taken to request the water authority to by-pass the water meter as this will enhance the flow and pressure. Alternatively a separate un-metered pipe may be installed to solely supply the sprinkler system. Flow rates can

be further improved by use of full-flow rather than 'banjo' type town main connections.

A sprinkler flow switch must be installed which will activate the fire alarm system (that covers the common parts of the building) upon operation of any sprinkler head. In these circumstances providing the fire alarm is an acceptable standard, the internal audible sprinkler alarm will not be necessary as this is a duplicate fire-warning signal (the external audio-visual sprinkler alarm must be provided in all instances). If however, it is decided that an internal sprinkler alarm is necessary, audibility levels of 75 dB (A) must be achieved at all bed heads, with the bed-sit doors closed.

A monitored link connected to a commercial call centre should be provided so that the fire service (and landlord) is automatically contacted upon actuation of the sprinkler system. This link should only operate upon actuation of the sprinkler system and not have any connection to the fire alarm system.

The system stop valve must be suitably locked in the open position or have the valve handle removed to prevent accidental/deliberate supply isolation.

A pressure gauge must be fitted before the main stop valve/backflow prevention valve to enable monthly checks to be made on the town main pressure.

The approved sprinkler contractor must provide information to the landlord as detailed in and also copy this documentation to the enforcing authority.

### Landlords Responsibilities

The landlord must enter into a maintenance contract with a competent person or company to maintain the sprinkler system in accordance with BS9251.

Landlords are responsible for ensuring that the sprinkler system is fully functional at all material times and any defects are reported immediately to the 24 hr emergency number and rectified as soon as possible. The enforcing authority must be notified as soon as practical of any system defects, deficiencies or actuations.

The landlord will be responsible for checking the pressure gauge readings monthly and recording these readings in the Systems Log Book. Any significant fluctuations or pressure readings below the agreed system design must be immediately reported to the enforcing authority. The System Log Book must also be used to record all actuations, testing, maintenance, system faults and any remedial action.

The landlord is responsible for maintaining a suitable monitored link, which will automatically alert the Fire Service of any sprinkler actuation.

Any deviations or failure to comply with any of the above conditions/design freedoms may result in the withdrawal of the HMO licence and could lead to enforcement action being taken.

## **6.0 USE OF RESIDENTIAL SPRINKLERS IN COMMERCIAL PREMISES**

The use of residential sprinklers in premises not specifically included in the scope of BS9251 will only be permitted in existing small premises where requirements in the B document and other guidance literature cannot be met by virtue of the existing layout of the premises.

In each case the premises will be dealt with on an individual basis. Only when both the Local Authority Building Control Officer and the Community Safety Officer have assessed the application and agreed on a solution will they be used. The solution must be supported by a comprehensive risk assessment from the premises owner/occupier or agent acting on their behalf.

An example of this is a small terraced ground floor shop, which it is proposed to extend to the rear and by doing so, would make one-way travel distances excessive.

A further example is where upper storey rooms which are unoccupied by virtue of excessive travel distances, may be used with a sprinkler system fitted.

In this instance the staircase would be required to be protected with self closing devices and smoke seals on all doors with an appropriate method of automatic fire detection.

## **7.0 COMMERCIAL SPRINKLERS AND APPROVED DOCUMENT B TO THE BUILDING REGULATIONS**

Approved document B (ADB) to the Building Regulations allows numerous relaxations where a sprinkler system is fitted. These may be such as levels of fire resistance to structure, notional boundaries, and compartmentation.

Where these relaxations are specified they are usually supported by the qualification that they should meet the relevant life safety recommendations of the supporting standard (BS EN 12845 or BS5306).

There may be circumstances where there may be scope for allowing a relaxation not specifically mentioned in ADB i.e. increasing the compartmentation size in schools from 800m<sup>2</sup> to 1600m<sup>2</sup>. Such relaxations should be considered as part of a fire engineering solution and should be supported by a comprehensive risk assessment supplied by the design team. In such circumstances consideration should be given to the relevant life safety requirements.