



**Design Freedoms**

**For Houses in Multiple Occupation**

**when**

**incorporating**

**Residential Sprinkler Systems**



# **Oxfordshire Fire Safety Partnership & Oxfordshire Fire & Rescue Service**

Proposals for design relaxation that may be considered against the requirements, as defined in the Housing Act 1985, where a Residential Sprinkler System, designed and installed to BS 9251: 2005 is installed in an Existing or proposed Houses in Multiple Occupation (HMO's).

## **Introduction**

The publication of the British Standard (BS 9251:2005) has seen the introduction of residential sprinkler systems to the UK. These systems are designed to mitigate and protect occupants and buildings against the effects of fire. A sprinkler system will detect, give warning, control, contain or even extinguish a fire. In the United Kingdom, no one has ever died as a result of fire in a building protected by a correctly installed and maintained sprinkler system.

## **General**

A fire sprinkler system is designed to cover a predetermined floor area, at maximum set distances from walls etc. Fire sprinkler supply pipes are permanently charged with water, which comes from the domestic water main. Fire sprinkler heads are fitted to the system of supply pipes and each is an independent unit and operates only if the fire causes it to do so. Each fire sprinkler is fitted with a small thermal element (Bulb) this is activated by heat from the fire. The thermal element is set to operate at a fixed temperature, not less than 30 degrees C above ambient temperature, which makes it very unlikely to operate other than in fire condition. In the majority of fires just one sprinkler head is operated and that is sufficient to deal with the fire

## **Assessment procedure**

All proposed installations of residential sprinkler systems must be made subject of the approved procedure by the enforcing authority and fire authority. This will determine the appropriate standards to satisfy the fire safety measures applicable for the specific premises or building, taking into account the following: -

- The layout of the premises or building.
- The number & nature of occupants.
- The condition of the premises or building.
- The standard of management or landlord control of the premises or building.

Consideration should also be given to the Approved Document issued to support the Building Regulations and the Department of the Environment Circular 12/92 and any other relevant standards.

The risk-based assessment must take into account the level of protection and fire safety benefits provided by a residential sprinkler system.

This will enable the enforcing authority and the fire authority to consider deviation from prescriptive codes and to permit certain design freedoms subject to formal approval from the relevant building control body.

## **Design Freedoms where a fire sprinkler system is installed**

For existing 1,2, & 3 storey premises.

**Note:** Cellars/basements do not count as storeys providing they only contain non-habitable room i.e. storage only.

Design freedoms for premises of 4 storeys and above will be determined on an individual basis and do not form part of this document.

Fire Door sets.

The requirement for 20, 30 & 60 minute fire resistance for doors sets.

- **The Design freedoms, subject to formal approval; All Individual doors must be of sound construction, integrity and maintained in good condition so that escape routes can be safely used during the evacuation period; For 60-minute fire resistance this could be reduced to FD 20 standard.**

The requirement for intumescent seals on doors leading onto common escapes routes.

- **The Design freedoms, subject to formal approval; May be relaxed, However these doors will still require cold smoke seals and overhead self-closing devices (conforming to BS EN 1154: 1997).**

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

The requirement for Basements to be separated by two-door protection.

- **The Design freedoms, subject to formal approval; Where two door protections are required this may be relaxed to room protection only**

The requirement for Fire resistance of walls, floors & soffits.

- **The Design freedoms, subject to formal approval; May be relaxed. If they are of sound construction, integrity and maintained in good conditions so enabling the escape routes to be safely used during any evacuation.**

The requirements for Spandrels and Cupboards.

This requirement will remain unchanged. Under-stair cupboards presenting a fire risk **must** be upgraded to a thirty-minute fire resisting standard or cleared and sealed shut.

The requirement for compartmentation between different Purpose Groups.

- **The Design freedoms, subject to formal approval; Reduced levels of fire resistance between different Purpose Groups may be allowed providing the whole building is sprinklered to the appropriate standard**

The requirement for internal linings to be protected to class 'O' standard to reduce fire spread.

- **The Design freedoms, subject to formal approval; 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).**

Travel Distances requirements.

- **The Design freedoms, subject to formal approval; the distances referred to, in Department Of Environment circular 12/92 paragraph (2.11) may be increased by up to 25%.**

The requirements for fire resisting glazing and windows

This requirement will remain unchanged, any glazing between habitable rooms and the stair enclosure (excluding glazing to a bathroom or wc) should be of fire-resisting standard and retained by a suitable glazing system and beads, compatible with the type of glass.

## Emergency Lights.

These requirements will remain unchanged, as provision of fire sprinklers does not negate the need for adequate lighting to aid escape

## Fire Warning Systems.

The fire alarm system must conform to all the requirements of British Standard 5839-6: 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 a minimum of 65dB(A) or 5 dB (A) above any background noise above 60dB(A). 75dB(A) should be achieved at all bed-heads. The system should be capable of delivering approximately 85dB(A) at the doorway to each bedroom (with the door open). 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).

The requirement for heat detectors in bedrooms/bedsits with cooking facilities.

- **The Design Freedoms, subject to formal approval; as sprinkler heads have an effective heat-sensing element; it is not necessary to provide a fire alarm heat detector. However, each bedroom/bedsit (regardless of whether or not they have cooking facilities) should be provided with a non-interlinked optical type smoke detector, which conforms to (BS 5446:1: 2000) 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/bedsits should be standalone, single point detectors i.e. non-interlinked.**

The requirement for heat detectors in kitchens.

- The Design freedoms, subject to formal approval; 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).

The requirement for fire fighting equipment..

- **The Design freedoms, subject to formal approval; Portable fire extinguishers may be required. However, bedsits with cooking facilities and kitchen areas should be provided with a fire blanket (conforming to BS EN 1869).**

## **QUALIFYING CONDITIONS FOR DESIGN FREEDOMS**

### **Sprinkler Systems**

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 and 3rd-party accredited, 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, BS 9251: 2005 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 BS 9251:2005, may include Systems that currently comply with an American industry standard, National Fire Prevention Association (N.F.P.A. 750.), Water Mist System.

Sprinkler heads must have a quick response thermal sensitivity rating, be of the residential pattern type and conform to DD252<sup>1</sup> or UL1626. Concealed and recessed sprinkler heads (clause 5.2.9.2) are acceptable to the enforcing authority.

Audibility levels of 75 dB (A) must be achieved at all bed-heads, with the bedsit doors closed (clause 6.2.3).

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 and conform to (clause 5.3.3.3) 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.

Consultation with 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 (clause 5.3.3.2 a)) will not be necessary as this is a duplicate fire warning signal (the external audio-visual sprinkler alarm must be provided in all instances).

Alternative Residential Sprinkler System, which does not currently complying with BS 9251: 2005

In addition to residential sprinklers, which comply with BS 9251: 2005, it is possible to install a Water Mist System for life safety. In these systems the method of water delivery, is in the form of a fine mist rather than a spray. These systems operate using water from stored pressure cylinders and are not reliant on the domestic water mains, however back up supply can be provided from the mains where necessary. Such systems will require to be subjected to fire engineering principles in the absence of any British Standard approval and each case will be judged individually by the enforcing authority and the fire authority as necessary.

### **Landlords Responsibilities:**

The landlord must enter into a maintenance contract with a competent person or company to maintain the sprinkler system in accordance with clause 7(maintenance) of BS 9251:2005

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 (clause 6.3.2.g). 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.

Pressure and flow due to the requirement for a second check valve to be fitted (Water Regulations: Fluid Category 3 risk).

The approved sprinkler contractor must provide information to the landlord as detailed in (clause 6.3.2) and copy this documentation to the enforcing authority and fire authority.

