Sprinklers and Automatic Water Suppression Systems

1. Many of the recommendations and comments in the main report refer to and deal with the issue of sprinklers, both for new builds and retro fitting.

Recommendations

Recommendation 4. Recommendation 7. Recommendation 11. and Recommendation 12.

1.1 As has been stated in the report, there are some mixed views in relation to the fitting of sprinklers but having considered all the evidence put before them, the Scrutiny Scoping Group is firmly of the opinion that sprinklers save lives and should at the very least be fitted as a matter of course along with hard wired smoke alarms/fire detectors in all new builds and buildings undergoing major refurbishments.

2.0 Evidence for the implementation of Sprinklers/Automatic Water Suppression Systems

2.1 Water Suppression Systems are already mandatory in countries such as the United Stated and Wales for all new build properties. These systems can prove invaluable in helping to save lives and to reduce damage caused to a property by fire.

2.2 A recent statement from the National Fire Chiefs Council (NFCC) (supported by Nottinghamshire Fire and Rescue Service) has come out in favour of sprinklers stating:

> '*Sprinklers are the most effective way to ensure that fires are suppressed or even extinguished before the fire service can arrive…They save lives and reduce injuries, protect firefighters who attend incidents and reduce the amount of damage to both property and the environment from fires'*

2.3 The NFCC did however also make it clear that sprinklers formed part of an overall fire safety solution and that it supported the concept of a '*risk assessed retro fitting of sprinklers in existing buildings'*

The Statement goes on to say that sprinklers are extremely reliable and that they extinguish or contain a fire on 99% of occasions.

2.4 It is also the current strategy of the West Midlands Fire and Rescue Authority (WMFRA) to:

> *Encourage the installation of Automatic Fire Suppression Systems (AFSS) where persons or premises are identified as being high risk in the Authority's Integrated Risk Management Plan.*

And the West Midlands Fire Service state that they are:

> *Fully committed to promoting the installation of AFSS in all premises where their inclusion will support the vision 'Making West Midlands Safer, Stronger and Healthier'. (WMFS Briefing Note: Audit Committee)*

2.5 Fire Safety Officers in the West Midlands have now also updated a response Building Control letter template in support of the use of sprinklers to say:

> *Sprinklers save lives, property and businesses. In a recent study looking at their activation in emergency situations (2011-16), sprinklers were found to have extinguished fires in 99% of cases where they activated*. This Authority wholly supports the installation of sprinklers and other suppression systems where appropriate, which can only help to make the West Midlands safer, stronger and healthier.*

** Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom, National Fire Chiefs Council (NFCC) and National Fire Sprinkler Network (NFSN)*

2.6 Sprinkler protection is also looked on very favourably by insurers of schools and other buildings, who can give premium discounts of up to 75%, and remove the compulsory excess, which can be as much as £1m.

3.0 Concerns relating to Sprinklers/Automatic Water Suppression Systems

3.1 Damage due to accidental activation:

3.2 Much less water is discharged by a sprinkler than would be discharged by the Fire Service. A fire sprinkler uses between 1/25th and 1/100th of the water used by each Fire Brigade hose (*Fire Sprinkler Association: http://www.firesprinklers.org.uk/).* Over 50% of fires are controlled by one or two sprinkler heads and are limited to an average of 5 meters squared; without sprinklers this average goes up to 21 meters squared with the associated enhanced costs and disruption. Should a school protected by sprinklers experience a fire, damage will be localised and the remainder of the school unaffected. Even the damaged part of the school can be back in use within hours instead of months.

3.3 Statistics also show that accidental operation occurs in only one in 16 million cases and in most of these cases the cause is human error *(Fire Sprinkler Association:* http://www.firesprinklers.org.uk/*).* Each sprinkler head is independent and is activated by heat with a thermal element set to operate at a fixed temperature, in most fires just one sprinkler head is activated and is sufficient to deal with the fire.

4.0 Cost

4.1 The Group agree that retro fitting sprinkler systems is generally more costly than fitting in a new build but this must be considered against the cost of fire damage and the possible savings from insurance.

4.1 Cost of School Fires in the UK

Fire Protection Association (FPA) have estimated the average cost of a large loss school fire to be approximately:

2009 (rebuild)	£330,000
2014 (rebuild)	£2.8 Million

(WMFS Briefing Note: Audit Committee)

4.2 The estimated cost annually (based on figures from 2009 to 2014) from large fires in educational buildings is £67.2 million. However, a rebuild will take time, temporary accommodation is required and the education of thousands of children will be disrupted. There is also evidence to suggest that it is children from the most disadvantaged backgrounds that are most likely to be affected by such an event and that even a short break from education effects future success:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/412638/The_link_between_absence_and_attainment_at_KS2_and_KS4.pdf

4.3 Different Approaches:

i. A fire at a large high school in the West Midlands where 1000 pupils had to be evacuated spread rapidly through the science block with more than 100 fire fighters in attendance. The fire caused major damage and some disruption to transport links and long term stability for the pupils. The damage was estimated to have been approximately £15 million. The school has been rebuilt without sprinklers.

ii. Conversely following a fire at the National Motorcycle Museum in Birmingham which destroyed hundreds of rare and vintage motorcycles, the building was rebuilt with sprinkler protection. *(Efficiency and Effectiveness of Sprinkler Systems in the United Kingdom: An Analysis from Fire Service Data; May 2017; Optimal Economics*).

4.4 Costs for fitting sprinklers in a new build school

The Scottish Fire & Rescue Service, have identified the costs for installing fire suppression in three new Scottish schools was between 1% and 2% of the total build cost:

School	Cost of sprinklers	% of overall cost
X	£590k	1.8
Y	£400k	1.7
Z	£180k	2.1

These figures vary with figures released by the Education Minister in October 2015, which refer the inclusion of sprinklers adding between 2% and 6% to the cost of works.

5.0 Locally

5.1 Birmingham City Council has already pledged to retrofit sprinklers to the 213 blocks it owns at a cost of £31 million.

5.2 *Sprinklers Stop Fire in Wolves*

https://www.wmfs.net/sprinklers-stop-wolves-fire/

Firefighters were called to a student block in Culwell Street housing 20 occupants on Friday 8 September. The fire crews arrived within 4 minutes but due to the buildings sprinkler system the fire was already out/ The fire had started in a chip pan on the 14th floor, Group Commander Simon Hardiman, the Head of Fire Safety, stated:

Fortunately, the building's sprinkler system was actuated and prevented a fire which could have caused considerably more damage than the small amount which did occur.

The fire was contained by just one sprinkler 'head'. Our crew remained on site for a short while to assist with the initial clean-up work. However, thanks to the sprinklers, they were able to leave within half an hour and be ready to respond to other emergencies.

Sprinklers are the most effective way to ensure that fires are suppressed or even extinguished before firefighters arrive. They save lives and reduce injuries, protect fire crews and reduce damage by fire to both property and the environment.

In the last 12 months, the National Fire Chiefs Council (NFCC) and the National Fire Sprinkler Network (NFSN) have worked together to investigate the effectiveness and reliability of sprinkler systems. In 99 per cent of incidents at which they actuate they extinguish or contain the fire.

Sprinklers are an effective part of an overall fire safety strategy, and can be used to improve fire safety in a range of new and existing buildings.

Along with the National Fire Chiefs Council, we support the risk-based, retrospective fitting of sprinklers in existing buildings.