

SCEME's views on installing sprinklers in schools

If you want to provoke debate and discussion with a room full of engineers, just mention sprinklers in schools and then quickly exit the room. I guarantee, if you're brave enough to return an hour later, they will still be discussing their experiences and frustrations. So why do pipes that are just filled with water lead engineers, and to be fair architects and other professionals, to become so vocal?

It started in March 2007 when the then Department Children, Schools and Families (DCSF) launched their policy on sprinklers in schools and subsequently published Building Bulletin 100, Design for Fire Safety in Schools in November 2007. It set out the normal means of compliance with Building Regulations for fire safety design in new school buildings (Approved Document B (Fire safety) – Volume 2 - Buildings other than dwelling houses (2006 Edition)). There is an expectation that all new schools will have sprinklers fitted. Any exceptions to this will have to be justified by demonstrating that a school is low risk and that the use of sprinklers would not be good value for money. A risk assessment tool was developed to help designers make the right decision.

School sprinkler design is about property, and not life, protection. In the UK, life protection systems are more complex and hence more expensive. In almost every case the DCSF risk assessment tool will indicate a medium to high risk and thus require a sprinkler system. It should be pointed out that the building bulletin is guidance only - not mandatory - and nor are sprinklers in schools a building regulation requirement. However, it is felt by SCEME members that whilst the risk assessment tool is the right approach in helping set a fire strategy, it should be reviewed, as it does not sufficiently reflect all local circumstances, history and knowledge. Whilst there are clearly parts of the country where arson and fire risk are very high and sprinklers are an effective solution, likewise there are areas of low risk and the tool weighting is not appropriate to reflect that. For example, our members would not install sophisticated intruder alarms, CCTV systems and high perimeter fencing in a very low crime area just in case of a burglary. Yes it could happen, but local knowledge and experience makes it a very small risk.

However, what has caused so much disquiet is the way in which many local authorities over the years have started to implement school sprinkler policies without full and proper consultation with their professional engineering advisors. SCEME cannot recall any other similar policy decision in that manner being taken that clearly increases both building capital and revenue costs. Our SCEME members were being told all of the benefits but were finding, in reality, that they were not all necessarily applicable in their circumstances. Moreover, much like booking through a low budget airline, the final actual cost of sprinklers was not matching many of the costs quoted by various bodies. As a consequence, our members were left either having to explain to their sponsors why projects were overspent, or that they would require further funding. As every QS will tell you, the first cost is the one that everyone remembers and this policy made our members' lives very difficult at times.

Our membership does recognise that sprinklers, along with other fire management solutions, should all be considered when developing an appropriate fire strategy and solution. School sprinklers are an emotive subject and it can be difficult to have a professional and rational debate without the accusation being made that an engineer has no concern for either children's safety or that of fire officers who risk their lives tackling school fires. Naturally health and safety is our member's number one concern and always will be. But design teams have to make difficult decisions, balancing all the competing demands on an ever decreasing budget. Whether it is

sustainability, BREAM, gas or electrical regulation changes, energy conservation, or new building regulations, they all have to be funded out of existing or decreasing budgets! In an ideal world every new initiative or requirement would be fully funded but the DCSF whilst developing sprinkler guidance and a risk assessment tool had no funding to offset this extra cost. This meant that our SCEME members had to find between 2.5 to 5% (or even more) of the capital construction costs, often from within their existing budgets, to fund sprinklers in a typical primary school. Furthermore, schools would have to pick up the increased revenue costs. So was this providing value for money in safeguarding our children in schools or could/should the money be spent more effectively elsewhere our members asked?

The Department for Transport published statistics on road casualties in accidents reported to the police in Great Britain in 2008, and according to the arrangements approved by the UK Statistics Authority the number of children killed or seriously injured in 2008 was 2,807 (down 9 per cent on 2007). Of those, 1,784 were pedestrians, 6 per cent down on 2007. 124 children died on the roads. Contrast this to schools where it is rumoured that two children have died in school fires since the Second World War (which apparently occurred in a playing fields shed). Of course that doesn't mean we should be complacent as a school fire could occur tomorrow with horrific consequences but statistically our schools have been very very safe places compared to other environments that our children encounter daily. They are at far greater risk as a pedestrian and, therefore, would it not make more sense to be directing further funding into road safety than school sprinkler systems in the interest of safeguarding their well being? Therefore for a school, perhaps sprinkler benefits are more about more about the mitigating the psychological impact of a major fire, the impact on the community and loss of facilities, the loss of school work, and disruption to children's education, etc. Not easy to measure or quantify but more logical as an argument. Equally our members have expressed a view that perhaps more attention should be focused not on new build, which are built to far more stringent regulations, but on the fire risk of our existing building school stock. Would the money being spent on sprinkler installations for new build be best spent on surveying existing schools and identifying potential risks and raising fire safety awareness? The purpose of installing sprinklers in schools has never been really clear to our membership. Are sprinklers about safeguarding, reducing disruption to children's education and the wider community or for insurance reasons?

So what are the experiences of SCEME members with respect to school sprinklers?

There is a lot of confusing and conflicting cost information published that, if taken at face value, could easily lead to an embarrassing financial shortfall if simply incorporated into a budget. Our advice would be to check:

- the sources of the costs published and ask could the author have a vested interest or perhaps have limited knowledge of the construction process?
- are the school figures quoted referring to a secondary school rather than a primary school? A secondary school has an economy of scale so perhaps 1.8% of construction costs for a secondary school is expected compared to 2.5% to 5% (or more) for a primary school.
- are the school figures quoted referring to a mains fed system or fully pumped system requiring a large housing for the considerable plant and tank?

It can be difficult to obtaining accurate historical cost information as many local authorities have out sourced their design teams and PFI providers are often reluctant – due to commercial confidentiality - to provide any meaningful cost data.

When looking at the developed cost plan it is worth checking that:

- all associated builders work associated with an installation is included. For example, holes for sprinkler pipework, trenching, making good, valve chamber, full housing for a tank, painting pipes, etc. Remember if your tank will be incorporated within the school to include the cost of that dedicated space including the structural implications of storing the many tonnes of water.
- controls, electrical supplies, generator (if required), panel interface and other associated equipment are all priced.
- for the utilities cost, especially mains water connections are included
- the cost for designing and constructing a suitable housing has not been overlooked.
- the extra design costs for the design team associated with a sprinkler installation are identified.

Remember purpose built housings will need planning permission so make sure they are included in your planning submission.

It does well to remember that, when fitting sprinklers into an existing building, the location of the heads takes priority over all other services. This requirement can result in considerable extra cost as a consequence of having to relocate light fittings, ventilation ducts, grilles etc.

Whole life costs are increased due to the added maintenance and servicing costs of plant associated with the sprinkler installation. This can create difficulty when attempting to prove VFM.

On a mains fed system what would be the implications and costs if the local water pressure fall and pumps and storage become required? Who would pay the school or LA? Could the design be easily adapted to include a tank and housing and would there be planning complications?

What are the full ongoing maintenance costs? This ranges from the weekly testing to the full professional servicing. And remember if you are not able to demonstrate that you have maintained your sprinkler system in accordance with your insurers requirements, your insurer may legitimately reject any future claim.

Have you included for a "Red Care" or similar monitoring service? Again there is often assumption that all schools have intruder alarm systems connected to a monitoring service. This is a revenue cost for schools.

What are the insurance premium benefits that you will obtain? Our member's experience is that Local Authorities that have block insurance are unlikely to realise premium reductions for the occasional school fitted with sprinklers (when the overwhelming majority of their stock are not fitted with sprinklers). Whilst there are often "deductable" or "excess" benefits to be had, premium reductions are not available unless schools are individually valued. Insurance companies could be clearer on this when highlighting insurance benefits.

Whilst a sprinkler system should allow savings to be made in other areas (e.g. larger fire compartments, etc.), our members have yet to secure any significant savings for primary school design. Secondary school design provides greater opportunities to offset some of the installation costs.

There are also issues and costs related to ongoing maintenance of sprinkler systems for example,

- voids above suspended ceilings may need to be fitted with sprinklers and need to be accessible. Sprinklered roof spaces will need safe access and lighting.
- some school clients prefer sprinkler heads to be concealed above the suspended ceiling, with just a small flush circular plate on show in the ceiling tile to minimise vandalism risk. It's essential that if these plates are damaged (which are designed to drop off above a set temperature) are not stuck back on with glue. Yes, it's happened or they have been painted by an over keen school premises manager.
- sprinklers are not a replacement for good house keeping and only operate when everything else has failed. They do not prevent fires, they only respond to them and if there are no fires, they add no value to a child's education.

It is very important that you involve your insurer early so they can advise designers how to minimise cost and provide an effective solution. Equally consult with your local fire and rescue service early. Late engagement always leads to a poorer solution and lost opportunity.

In conclusion, our members would like to be able to offer their clients more choice and better value for money. The basic design concept for sprinklers has changed little over decades; using large diameter pipes which are ugly and obtrusive (and that's from an engineer). Our members would like to see an industry which could develop new and more cost effective alternative solutions (e.g. alternative simpler specification and lower cost systems) and take a more holistic approach to fire prevention.

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The views contained in this article are not necessarily those of Essex County Council