Domestic fire sprinklers – e-bulletin
No.2 – 9 March 2015

Introduction
Since the first e-bulletin (July 2013) there has been a significant increase in the number of sprinkler systems being installed in the UK and this is anticipated to increase particularly with the new legislative requirements in Wales.

This bulletin provides an overview of changes to legislation and standards relating to sprinklers and an update on water company policies and procedures relating to the provision of water for sprinkler systems

1) Regulations and water company policies

Water Act (2014) Update
During the progress of the Water Bill (now the Water Act 2014) through Parliament earlier this year a number of organisations lobbied for the recognition of sprinklers as a legitimate use of water as opposed to their current status as non-domestic water. An amendment was tabled by Lord Harrison to this effect when the Bill proceeded through the House of Lords in February.

The amendment was unsuccessful but following the debate and in subsequent meetings Lord de Mauley, the Parliamentary Under Secretary responsible agreed to write to all water companies encouraging them to follow the guidance in the WLG Protocol document and publish their policies on the provision of water for sprinkler systems.

In his letter addressed to all water companies he indicated that before the debate he had met with representatives of the All Party Parliamentary Fire Safety and Rescue Group who outlined the reasons for their proposed amendment. Lord de Mauley went on to explain the reason for not agreeing to the amendment which is included in the following extract from his letter to water companies:

"Section 147 of the Water Industry 1991 already states that water companies cannot charge for water for firefighting. This means that water used for fire sprinklers cannot be charged for.

I do not believe that fire-sprinklers need to be explicitly referred to in the legislation counted as water for fire-fighting. They are already accounted for within the legislation.

The Water Liaison group recently published the revised 'Guidelines for the Supply of Water to Automatic Fire Sprinkler Systems' with the aim of this being used to inform individual water companies' policies on connections for fire sprinklers. This protocol is designed to assist the conversations between water companies and the fire sprinkler installers by providing guidelines around the requirements for connections.

I am very supportive of this voluntary protocol and I am hopeful that you will update your policy on domestic fire sprinkler connections to reflect this protocol."

Welsh Sprinkler Regulations - Ian Gough MIFireE MCABE
In October 2013 the National Assembly for Wales passed regulations that introduced a new requirement into the Building Regulations for the installation of automatic fire sprinkler systems in certain dwellings[1]. The requirement is being introduced in two stages:

a) from 30th April 2014 for new and converted care homes, hospices, children's residential homes, certain hostels, boarding houses and student's halls of residences; and
b) from 1st January 2016 for new and converted houses and flats.

To prepare for this - particularly for those properties that will be subject to the regulations post 2016 - the Minister for Housing and Regeneration, Carl Sargeant, has agreed to run a series of pilot projects, designing and installing fire sprinkler systems into a number of new social housing developments across Wales. The project is to be monitored by the Building Research Establishment (BRE Global) and will be fully funded by the Welsh Government.

To date there are sixteen separate developments, involving 234 social housing units and 10 housing associations taking part in the study. The majority of the schemes are new build although two are conversions which may create additional challenges. They cover all the categories i.e. flats, bungalows, houses, extra care schemes and supported housing.

Furthermore, despite the desire to include projects from a range of geographical areas that would allow for experience to be gleaned from all the three water companies covering Wales: Dwr Cymru, Dee Valley Water and Severn Trent, mostly they are located in South Wales with 3 under construction in the North.

Those responsible for the social housing projects already accepted for the pilot study are, or will be, procuring the services of fire sprinkler contractors and installing equipment into their developments in 2015. The systems are expected to be designed and installed in accordance with BS9251: 2014 and will include direct main connections, boosted main connections and independent tank and pump supplies.

Clearly, therefore, the results of the study will be of interest to a variety of interested parties but particularly the home builders and water companies throughout the UK. A report is expected to be published early in 2015.

[1]The Domestic Fire Safety (Wales) Measure 2011 (Commencement No1) Order 2013

New Water Company Policies

South Staffs Water (Incorporating Cambridge Water) Domestic Sprinkler Policy
The purpose of the fire sprinkler policy document is to set out South Staffs Water's policy, vision and commitments to supporting the installation of fire sprinkler systems. South Staffs Water has two distinct operating regions; the South Staffs region and the Cambridge region.

The document launched in September 2014 can be found within the "new developments / new connections" sections of both regional websites – www.south-staffs-water.co.uk / www.cambridge-water.co.uk . The document is aimed to provide clarity for developers / installers on what we are able to provide and what is required from them. The document has purposely been kept at a high level and allows for developers / installers to discuss their individual requirements if needed.

The aims of the policy are to ensure enforcement of The Water Supply (Water Fittings) Regulations 1999, provide a supply of water where available for use with fire sprinkler systems, proactively engage with stakeholders to maintain best practice as appropriate and most importantly protect water quality.

Severn Trent Water
In August 2014 Severn Trent published their policy which can be viewed on their website: http://www.stwater.co.uk/developers/single-property-water-connections/

The policy was developed collaboratively with SME's from around the business. It references national guidance and relevant British Standards, offers guidance on the types of sprinklers available and gives a clear message on the use of water for the purpose of fire-fighting.

There are two installation options for developers and installers with easy to follow supporting drawings.

There are still a small number of water companies where their policy is either not developed or readily accessible and we will be writing to those to encourage them to do so.

2) Standards

BS 9251 Revision

Following an eighteen month review an updated and revised BS 9251 Fire sprinkler systems for domestic and residential occupancies – Code of practice was published in October. This is a full revision of the standard, and introduces the following principal changes:

- introduction of building categorization based on occupancy risk;
- change of building height limit;
- variation in sprinkler head design density;
- increase in sprinkler head spacing;
- expanded guidance on preliminary work and consultation;
- expanded guidance on water supplies;
- additional measures for vulnerable people and multi-occupancy premises.

The water industry was represented by Tommy Seggie, Scottish Water and a number of comments were received from WRAS and individual water companies during the Draft for Publication (DPC) which elicited a total of 328 comments from a wide range of interested parties.

This British Standard is intended for the use of designers, engineers, architects, surveyors, contractors, installers and authorities having jurisdiction. It provides much clearer guidance in a number of areas and has taken account of the lessons learned from the increasing number of installations and projects utilising residential sprinklers.

From a water supply requirement point of view the major impact is that the new standard reduces the amount of water required inn smaller premises. This has been achieved by:

- Adopting the design density approach over actual areas of sprinkler head coverage gives far more flexibility in design. Reducing the sprinkler spacing can have a dramatic effect in minimising the water supply demand, be it at the expense of introducing a few more heads. This potentially opens the door for more towns' main supply connections particularly for Category-1 systems with a design density of 2.04mm/min.
- Limiting the number of sprinklers operating to 2 for a Category-2 system.

Current water company policies relating to sprinklers are based on the requirements of the previous version of BS 9251 which required 60lpm. In the new standard the flow demand for category 1 systems could be as low as 30Lpm, (2.04mm/min x 1 head at 14.7m2 spacing), a reduction from the previous 60Lpm, and in a worst case no more than about 100+Lpm, (2.04mm/min x 2 heads at 25m2 spacing), which is little different to before.

For Category-2 systems, again the flow could be as little as the 30Lpm, (2.8mm/min x 1 head at 10.7m2 spacing) but in this case could possibly go up to 140Lpm.

For Category-3 systems, the flow could be as little as 60Lpm, (2.8mm/min x 2 heads at 10.7m2 spacing), much the same as before for a Residential system with 1 head running. The down side here is 4 heads running at the maximum spacing which gives 280Lpm, an increase of about 80Lpm.

It is anticipated that certainly for the smaller category 1 and some category 2 premises the new standard will allow more sprinkler systems to be connected directly to the mains.

3) Sprinkler Saves 2014

Steve Mills the National Fire Sprinkler Network representative on the Water Liaison Group records incidents where sprinklers operate in the UK. Below are sample of more notable incidents.

9th January 2014: Beaconsfield Street, London

At just before 11pm on the 9th January, a fire occurred in some clothing in a flat of a 10 storey residential block in Camden. One sprinkler head on the mains fed supply activated to control the fire. Two FRS pumps were sent to deal with the incident which was confined to the room of origin of the fire.

12th January 2014: Grosvenor Way, London

At 14:41 on 12th January 2014 a call was received by London Fire Brigade to a fire involving cooking oil on a stove in a flat at Hardy House, Wandsworth, a residential block of varying height between 4 and 9 floors. Two pumps were despatched though the fire had been controlled before arrival by one sprinkler head on the mains supplied system.

26th March 2014: Redhill flat

At about 21:00 hours on 26th March a fire occurred when the occupant of one of the ground floor maisonettes was 'recycling' candles on his cooker. They then proceeded to throw water upon the fire which caused it to flare up and activate the single sprinkler head in the kitchen of the flat. The F&RS attended but did not need to take firefighting action as the fire had been extinguished. An estimated 8 m² damage was caused by the incident.

12th May 2014:Essex House fire

At just before a quarter to eleven on the night of Monday 12th May as fire occurred in a house in Chelmsford, Essex. Essex Fire and Rescue Service mobilised two appliances to the incident. The property is one of three in a housing association managed terrace fitted with mains fed, BS9251 sprinklers.

It is reported that a fire had started in the lower of a set of bunk beds in a first floor bedroom of the two storey terraced house. Upon being alerted, the occupier tackled the fire with saucepans of water but as the heat from the fire rose, it activated one sprinkler head positioned in the bedroom. Though the fire was shielded, it is understood that no fire-fighting action was needed by attending crews due to the actions of the occupier and sprinkler system.

14th October 2014: Cumbernauld Flat

Cumbernauld House is the former headquarters of Cumbernauld Development Corporation but when that organisation vacated it was converted into residential apartments. During the conversion, residential sprinklers were installed.

It is reported that on the 14th October 2014 a fire started in one of the apartments when a candle, located in a bathroom, apparently disintegrated setting fire to nearby towelling.

It is understood that this fire was extinguished by the sprinkler head located in the bathroom.

NOTE: BS9251 advises that bathrooms with an area of 5m² or more should be sprinkler protected and this was so in the case above. The recent revision however suggests that an assessment of the risk present should also be made and it is well known that fires quite regularly start in bathrooms, with candles being a major ignition source.

14th November 2014: London apartment

On Friday 14th November a chip pan fire occurred at an apartment block at Waterside Heights, Lewisham, London. The tenant is reported to have tried to move the blazing chip pan but due to the heat was unable to keep hold causing the pan and contents spilled.

Fortunately, one sprinkler head in the room activated and extinguished the fire. Fire damage was limited so that the flat remained

habitable and though the tenant was shocked they fortunately suffered no serious injury.

The incident above once again shows, contrary to some understanding, that sprinklers can safely and efficiently deal with chip pan fires.

16th November 2014: Southampton Student Block

At just before 1:30 pm on Sunday 16th November 2014 a fire occurred in a microwave oven in a student flat on the 10th floor of Richmond House, a mixed height non-cluster type development in Southampton city centre.

One sprinkler head activated due to the fire and the 215 occupants were safely evacuated. Fire damage was reported to be limited to 10m² in the affected flat.

7th December 2014: Sprinkler save at Birmingham hotel

A report has been received concerning a sprinkler save at a city centre hotel in Five Ways, Birmingham, over the weekend of 6th/7th December.

At about 10pm on Saturday 6th December, at the end of the working day, a tumble dryer was unloaded at the leisure centre situated in the lower floors of the hotel. CCTV footage showed that at about 3am on Sunday 7th, a fire started in a laundry basket due to spontaneous combustion of the drying towelling material.

The fire alarm alerted staff and guests to the situation and one sprinkler head activated to suppress/extinguish the fire before the arrival of West Midlands Fire Service personnel.

Two Christmas sprinkler saves reported

Over Christmas 2014, two successful residential sprinkler activations were reported.

The first was on Christmas Eve in student accommodation in Liverpool due to an electrical issue. One sprinkler head operated to put out the fire.

The second, on Christmas Day, happened when a fire occurred in the bedroom of a house. Again one sprinkler head operated and controlled the fire.

BS 1710 updated standard for the identification of pipes and services

Since 1984, water services within commercial and industrial buildings have had some form of identification applied to them using BS 1710 - *Specification for identification of pipelines and services*. Since the standard was introduced, buildings services have changed as have the legal requirements within water legislation. In2014, the standard was revised bringing it up to date and enabling users to more easily meet the requirements of Water Supply (Water Fittings) Regulations and Scottish Water Byelaws. With the revision came a number of key changes:

- Ships systems were removed from scope of the Standard
- Below ground services came under the remit of the Standard;
- Requirements updated for building and water services;

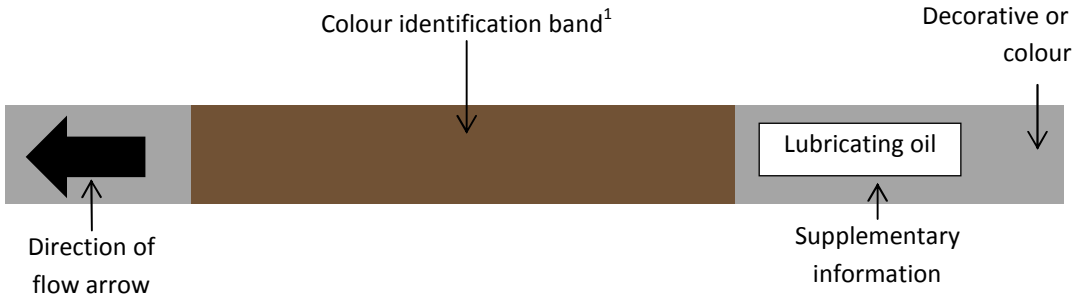
The principle changes revolve around the colours and the sizing of '*Service Identifiers*' used to classify fluids being conveyed. Identification for water services has been simplified to allow installers to more easily meet the requirements of the Regulations and Byelaws. Now, with a quick glance at the identification band, users will be able to identify the origin of the water supply; whether or not the contents is to drinking water standards; and if it forms part of a safety system, such as an inbuilt fire fighting.

Service Identifiers need to be suitably sized to be readily visible, repeated at regular intervals and are made up of 3 key elements:

- Colour identification bands;
- Supplementary information – to enable ready identification of different pressures, qualities and designated uses of the services;
- Direction of flow arrow.

A more flexible approach has been adopted to the sizing of the *Service Identifiers*, allowing them to be more easily fixed to smaller diameter pipes. The system is based on the external diameter of the pipeline or covering/insulation. The guidance covers three ranges of pipe size with the original sizing retained for the largest pipe diameters above 100mm, reducing down for the smallest pipe diameters of less than 50mm.

Example showing the application of a band of basic identification colour with separate supplementary information and direction of flow arrows



[1]Service Identifier sizing

- diameters up to 50 mm, minimum band width 130 mm
- diameters 50 mm to 100 mm, minimum band width 275 mm
- diameters above 100 mm, minimum band width 450 mm

Below are some examples of the new water services colour requirements. Principally pipes containing water shall be coloured green. An additional colour is applied to identify the source water; *Auxiliary Blue* applied for systems connected to the public water supply and *Flint Grey* for water from any other source such as wells, boreholes or water re-use systems.

Table showing examples of water service identifiers

Typical applications	Colour identification band	Source of supply
Source of water		
Potable designation for water meeting drinking water standards.		Water provided from the public supply (i.e. water undertaker)
		Water derived from a source other than the public supply (i.e. private borehole, well etc.)
End use water quality		
An additional black band to be applied where the end use fluid is not intended to meet standards for drinking water.		Public water supply system
		Any other source
Safety Systems		
Fire systems connected to a drinking water mains and containing no additives, following an assessment,may be considered for potable designation.		Public water supply system
		Any other source
Non-potable designation to be applied to fire systems which, are fed from a dedicated fire storage cistern, containing additives or where there is doubt regarding the water quality.		Public water supply
		Any other source

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