



INFORMATION NOTE - FIRE SPRINKLERS & WATER CONNECTIONS

[JULY 2015]

1. Background

This information note crystallises a number of points that have come out of discussions involving HBF, Welsh Assembly Government (WAG) and Welsh Water respectively, specific to the provision of fire sprinkler/water misting systems. The mandatory, albeit progressive introduction of sprinklers in all new buildings throughout Wales had its origins in a 'Private Members' Bill, introduced by a Member of the Welsh Assembly around four years ago. However, the quest for supporting evidence that supports this change in devolved Government legislation has not been easy to come by. Similarly, an analysis of the wider technical/cost implications. That said preliminary work undertaken by the HBF has shown that in the event of mandated provision of fire sprinklers in every new home in England there will be far reaching design and cost repercussions. Similarly, the potential for any number of unintended consequences. This note has therefore been produced to inform HBF members in the event that due consideration is given to a similar policy applying in England.

As part of the information gathering process matters specific to sprinkler arrangements were also discussed at the HBF/Water UK NIJDC meeting held on the 28th Jan 2015. At this meeting the HBF was advised that industry wide requirements for fire sprinkler arrangements had also been a prominent feature on the agenda of the last Water UK ⁽¹⁾ Developer Services Forum meeting. Importantly, this latter meeting arrived at a consensus that there was an overarching need for a comprehensive review of water company policy/requirements in terms of sprinkler installations. Bearing in mind that there are around 20 water companies operating in England, a consistent approach has considerable benefit for all partner/stakeholder interests.

The reader will also note that in addition to articulating matters from the HBF perspective, this information note also highlights a number of key comments from the water industry itself, in particular the approach to the supply of water for fire sprinklers.

With particular regard to Welsh Water, on February 16th 2011 the National Assembly for Wales passed one of the first examples of Private Member legislation. In essence this confirmed that the installation of fire sprinklers was to become mandatory throughout Wales - the first country in the world to do so. Initially, from April 2014 this applied to high-risk properties such as care homes, new and converted student halls of residence, boarding houses and certain hostels. However from January 2016 it will apply to all new and converted houses and flats. Note - domestic fire sprinklers are only mandatory in Wales. That said what is about to happen in Wales will likely have adverse repercussions for a number of national house builders operating in England and Wales and who have a range of established house types, many of which will already have type approval from Building Control bodies. Moreover, with the propensity for a significant increase in build cost this will not be sustainable in parts of the UK leading to an inevitable and lasting reduction in the provision of much needed new homes.

(1) Water UK is the equivalent Trade Association for the Water and Sewerage Sector (all WaSCs) in the UK.

2. Water Supply/Connection types:

In essence there are 6 alternative means of providing a water supply to fire sprinkler systems, namely:

- a) Connection to a pressure tank or vessel
- b) Automatic fire pump drawing water from a ground floor storage tank
- c) Automatic fire pump drawing water from an elevated storage tank
- d) Gravity fed supply of water from an elevated storage tank
- e) Direct mains fed system relying on mains water pressure
- f) Automatic fire pump drawing water direct from a mains water supply

Due to the complexity and prohibitive cost associated with tank based systems it would appear that types (e) and (f), as stated above, would be the most viable and/or best solutions. In many respects this preference is mirrored by a significant number of Water Companies in England and supported by the Water Supply Sector's retained advisor.

3. Legislative Compliance Requirements

Any system installed must be compliant with the Water Supply (Water Fittings) Regulations 1999 – this includes all pipework, pumps, tanks and ancillary equipment. A failure to ensure that this criterion is met invites criminal prosecution. This requirement extends to all types of connection and related fixtures and fittings that are in direct contact with potable water supplies, including pumps and check valves etc.

Pumped systems designed to be fed directly from the water supply with a pump delivery of 12litres/sec or more must be reported to the host water company. In addition, if sufficient pressure exists within the principal water main then a connection via a direct branch incorporating a check valve will be acceptable.

BS 9251: 2014 provides further guidance on domestic sprinkler installations.

4. Metering:

The metering of flows specifically to identify the volume water used for fire sprinklers is not required as there are no charges for water taken for this purpose.

General Comment – Whilst at present there are alternatives it would appear that above ground metering has many advantages not least when it comes to compliance with established disability awareness legislation insofar as it relates to the built environment. In many respects all domestic water meters should be located above ground to facilitate easy customer access. This reduces the incidence of damage whilst reducing the potential for further leakage. Above ground facilitates automated meter reading and is an approach that is gathering considerable momentum in many water companies. Moreover, it represents a first step on the road to realising the 'Smart Home' concept.

5. Incoming Fire Sprinkler Supply Cut off Valve

The connection pipe from the water main in the road or footpath to an automatic fire sprinkler supply must be fitted with an isolating valve. At present most isolating valves are located internally to the building and can be situated at various locations dependent upon the sprinkler design. However, given the potential for fire fighters to have to enter a building whilst the sprinklers are active, it is essential for any isolating valve to be sufficiently visible. The need for fire fighters to turn off the sprinkler system water supply is to reduce water damage to the property. The stop tap in the footpath or road cannot be relied upon in this event due to possible difficulties finding and accessing the appropriate meter chamber.

In many respects sprinkler cut off valves should be located external to the building and above ground. This allows the fire service to easily and quickly find the cut off valve and to terminate the sprinkler supply accordingly.

6. Backflow Prevention Device

Backflow prevention check valves should be incorporated into the design so there is no adverse impact on the quality of the domestic water supply.

7. General Notes

- 7.1 It is not the water company's responsibility to determine whether water pressures will be sufficient for the sprinkler system that is being designed, or for that matter that adequate water pressure can be maintained. It is the duty of the designer to ensure that whatever system is chosen it operates effectively. That said the underlying worry for water companies is that should an incident occur and there is loss of property, or serious injury to the occupant(s) as a result of the system not operating due to inadequate pressure and/or water availability, then the water company will inevitably be held to account, if not legally then morally. Media driven reputational damage will be a reality not a perception.
- 7.2 In areas where water pressure is historically low there will be a need to consider storage tank based sprinkler systems. However, water companies should not, as a starting point, simply impose a preference for tank-based systems. These systems are overly expensive and result in significant additional construction costs – see later comments. House builders should have the freedom to choose less expensive but wholly adequate alternative systems. Water industry preference for tanked storage fire sprinkler systems has more to do with being able to operate water supply networks at much lower delivery pressures to reduce potable water leakage without having to incur intervention capex. The HBF view is that this is not an acceptable way forward and with tanked storage systems being as expensive as they are, this effectively transfers a disproportionate cost onto the Developer. Moreover, tanked systems carry a high maintenance burden/cost for the home owner and at present, there is no mandated requirement in Wales to undertake annual/routine maintenance. From a consumer perspective, a failure to undertake routine maintenance introduces further risk together with the potential to invalidate house and contents insurance cover. In many respects whole life costs should be taken in to consideration for both the house builder and home owner as well as informing any regulatory impact assessment, in the event that consideration is given to the introduction of sprinkler systems in England.
- 7.3 It has been suggested that some home owners will use the fire sprinkler service pipe connections for illegal water use. The HBF does not consider this to be a valid reason for water companies to mandate an upsized meter to be connected to the 32mm sprinkler supply pipe. The HBF believes this is a costly overreaction.

According to the Welsh Water (WW) website they require a meter fitted to the 32mm connection but conversely WW has confirmed that at present, they do not have a meter that is suitable for this purpose. Therefore water charges will be levied on an 'assessed measured charge' basis until a meter is eventually fitted. Water used by domestic fire sprinklers used for firefighting will not incur a charge. In Wales, when the supply is metered, a rebate will be made for any water used for fire sprinkler purposes but how this is to be calculated remains unknown at this stage.

7.4 Sprinkler connections are classified as supplies for non-domestic purposes by the Water Industry Act of 1991. This will impact on the current Open Water reform/charging rules proposals for England and may result in the developer having to make two separate water supply applications.

7.5 Water companies will need to consider the legal situation when seeking to impose underground storage tanks for fire sprinklers in so much they will most likely be adopting the customer's service pipe within the next few years.

7.6 Tank based fire sprinkler systems have ongoing maintenance costs for the home owner. This is important because poorly maintained underground water storage tanks have long been associated with leakage. Moreover, given that service pipe leakage amounts to approx 23% of all water industry leakage it therefore follows that by increasing underground water apparatus/infrastructure this also increases the potential for future (additional) leakage. (Note: The Water and Sewerage Sector has signed up to nearly zero potable water leakage by 2050).

7.7 The provision of internal storage tanks will result in costly design and construction amendments to developers established house type portfolios. In addition, other on-costs such as tank maintenance and periodic water sampling for legionella will need to be considered. As part of the CDM process these are key considerations that will have to be articulated to the home owner. Moreover, based on research undertaken to date there could be difficulties when designing/constructing a hipped roof. However, of even greater significance will be the demise if not the loss of 'room in the roof' design solutions. This concept is often utilised as a means of ensuring sustainable land use/plotting efficiency in addition to being a key design solution to support project viability on marginal sites. If this design solution is compromised or no longer available then the impact on future housing delivery could be significant.

8. Summary

To date the case for the mandatory imposition of fire sprinklers in every new home in England has not been effectively made. Moreover, based on current research the position of many water companies is not dissimilar to that of HBF – a number of shared concerns having been identified. That said as future revisions to Approved Document 'B' of the Building Regulations gain traction it could be that fire sprinklers and/or misting systems become a key part of any future iteration/recommendation. This information note should therefore provide HBF members with further food for thought.

HBF London
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