Legionella - reducing the risks to the infrastructure in large hospitals and commercial premises.

I/We have been troubleshooting and project managing issues with large domestic water services for the past 35 years. The last 20 years have been spent mainly working as a full-time as a Mechanical Engineering Consultant for many NHS trusts located around the country. The majority of that time has been spent addressing issues with and up-grading large complex water, ventilation, and heating systems.

Three years ago I was engaged by a South London NHS Trust to investigate some problems with their domestic water services on site which caused several of their wards to close due to issues with microbiological proliferation in the pipework. These issues were addressed with some remedial works and a management plan. After three months the trust was dissolved and taken over by a local proactive forward-thinking Trust. I was asked to continue my role as Mechanical Engineering Consultant/Authorised Person for Water. I was tasked with upgrading parts of the domestic water services on the site.

We replaced calorifiers, pumps, booster sets, TMV's, pipe work, removed dead legs etc. All the regular stuff associated with upgrade works. One of the tasks that I carried out was to replace the cold water storage tanks on site, which is my reason for writing these notes. I thought it wise to share my methodology for the installation in the hope that it might give others some guidance doing similar tasks.

Problems that arise with the hot water services can usually be addressed by achieving a uniformed temperature throughout the infrastructure of above 55°C. The cold stored water service is normally more difficult to manage.

The site in question was going through a transition of use and one could only estimate what the future requirements for stored water on site will be. We have on site a Water Management Advisory Group which meets monthly and made up of the various professions as recommended by the current guidance. The majority of the health and safety/water management group favoured 24 hours of water storage on site.(I personally think this is excessive if the appropriate alarms and contingency plans are in place

Before the order was placed for the replacement tanks, water meters were installed on the softened water which feeds the calarifiers and the raw water which supplies the cold water down services. The site uses approximately 2 times the amount of raw water as it does softened water. The water storage tanks were ordered as a large split tank with a ratio of two to one. My reasoning for ordering one large split tank and not two separate ones was that the heat gain from the tank room would be considerably less owing to the fact that one large split tank has a considerably less surface area than two single ones.

The storage tanks are in a fifth floor plant room and gravity feed the site. These tanks are fed from a ground floor plant room via break tanks, booster sets and a water softener. The levels of the tanks are monitored by pressure transducers. The system is controlled by the building management system which monitors and records the amount of water usage and it’s temperature. The amount of water storage is automatically controlled by the Trend building management system and can be monitored and adjusted from any network trust PC. This enables the estates Department to adjust

the amount of stored water on site to suit the sites requirement and also adjust the amount of stored water to aid maintenance of compliant temperatures in the summer months.

The fifth floor storage tanks are filled up with the ground floor booster sets which have a soft start i.e. it takes them a minute to ramp up, this negates any requirement to install additional devices to reduce water hammer etc.

An added bonus to this installation is that when any of the plant fails or the stored water level drops below 5% of the set value an alarm is sounded in the 24-hour switch room which is then passed on to the maintenance staff. In the past the only time the site has become aware of an issue with the water supply/plant is when water has stopped coming out of the taps.

I have been witness to many cold water down service installations over the years and I am not aware of a more economically viable and practical way of managing cold water storage on site.