

**Site : Notton House School, Notton, Nr Chippenham,
Bristol City Council**

This is a residential school that looks after children that are 'in care' and needing special educational provision.

The school had a serious water heater failure about a year ago, due to limescale build-up that could not be removed. The pipework from the heaters leading to the main HWS distribution had to be replaced for about 15 meters where the pipe had had its effective bore drop from 42 mm to about 12 mm and possibly less than this in places.

Notton House School

Two new Strebel water heaters had been fitted during the past year. 6 months ago, (Sept.'04) a commercial KalGUARD+

Limescale issue that caused the old water heaters to fail

was fitted by the building owner, Bristol City Council, to see what protection this would give the water heaters. This inspection (Feb.'05) should verify how this had affected performance.

New Strebel water heaters installed this year.

On inspection, the water heaters appear to have a vitreous enamel inner coating on the walls. Where it would have been expected to see significant limescale build-up after only 6 months of operation at this site, this time there was only a little limescale attached to any surface. A few small pieces were on the inner flue pipes (see photo below).

The domed bottom heat transfer surface had quite a collection of what is best described as a sandy silt. This was then flushed out with a hose to the drain off point and leaving a clear inner surface. This silt was later determined to be residue from the HWS pipework system that had collected in the heaters.



Virtually clean flues

The particles appeared to be minute limescale pieces that have eroded from older limescale deposits and is typical of that seen in other installations. This comes from the hot water recirculating pipework and is showing that the existing limescale is breaking down and then being moved on by the pumped flow until it finds a place of quieter water where it settles out, being the water heater main tank. This is expected to happen for the next few months when it will then stop, confirming the HWS pipework will then be clear of limescale.

The water heater were then cleaned. This was then simply performed by using a hose. No brushes were used and the sediment was flushed out through the drain point. Subsequently, we took new photos (shown here) and the water heater is shown to be clear of limescale and the main heat transfer surface was effectively clean.



Main heat exchange surface seen to be clean

It is estimated that life expectancy of the water heaters will be about 8 to 10 years now, rather than half this time previously experienced. This is giving a significant reduction in asset expenditure at the school. In addition, as limescale deposits build up, water heaters loose 7½% heater efficiency for every 1 mm of scale. On this site, the heaters would have been loosing 25% with the serious limescale previously experienced. This installation now has water heaters working at 100% of manufacturers claimed efficiency and is potentially saving the School about £500 a quarter in gas expenditure. The rapid 'pay back period' for the KalGUARD+ unit means that it pays for itself within 12 months.