Legionnaires Disease:

Hospital Engineering Perspective

WATER STORAGE

Water storage tanks

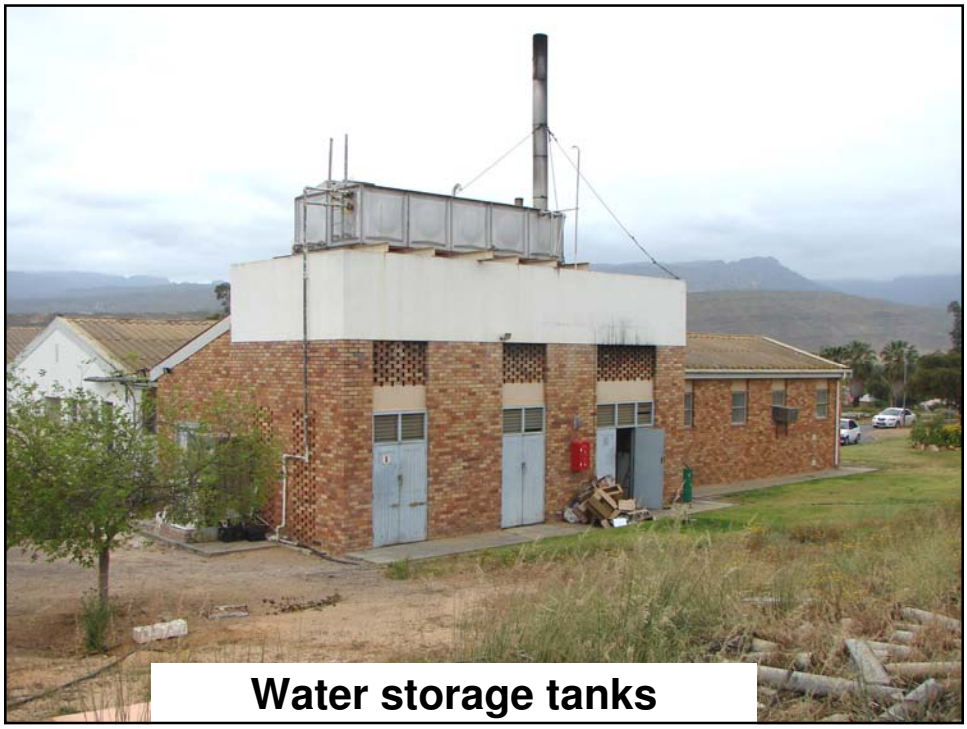
Water storage tanks

Hygiene

Are the tanks ever cleaned?

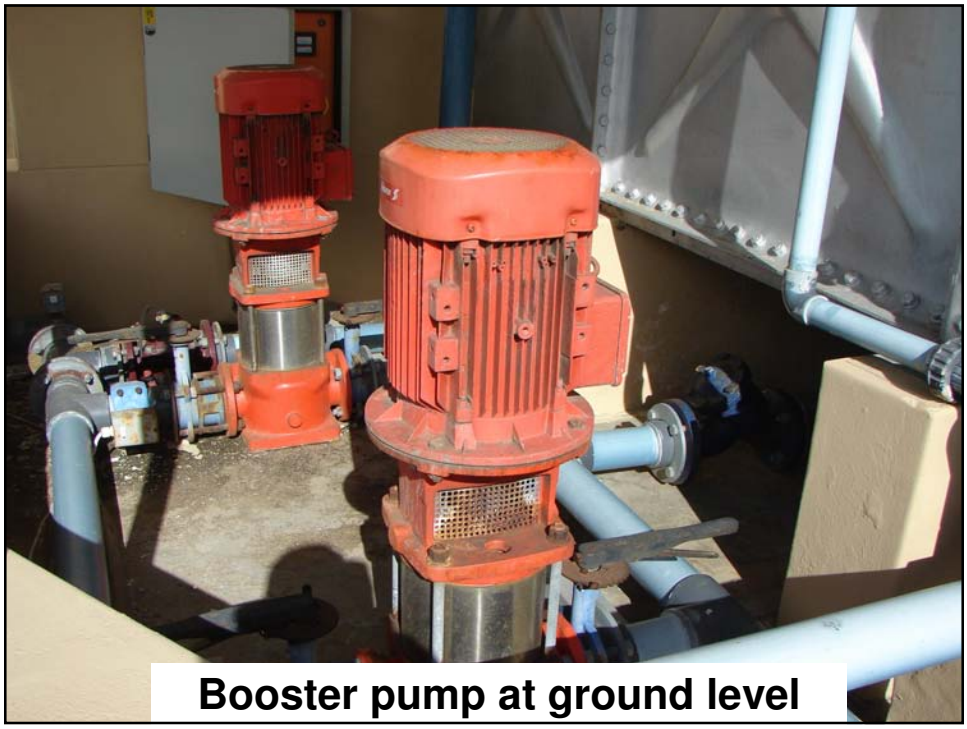
Are the lids closed?

What about chlorination loss?



Water storage tanks

Storage tank at ground level



Booster pump at ground level

COOLING TOWERS

LEGIONELLA & TEMPERATURE

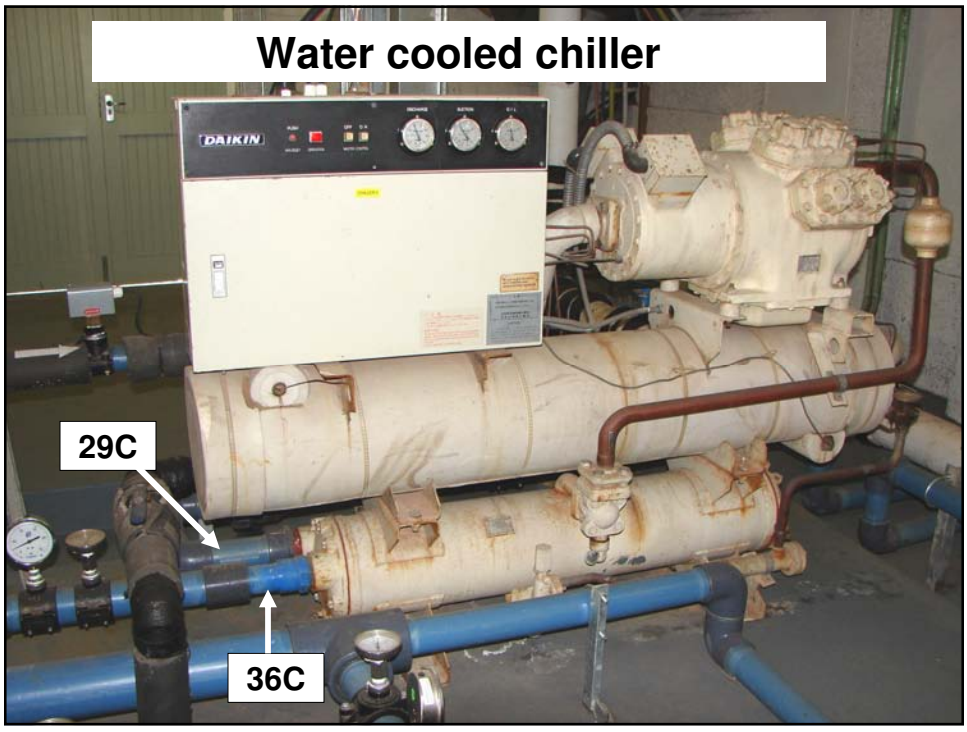
Ideal temperature to multiply 32 C to 42 C

Greatest increase in viable counts 37 C to 42 C

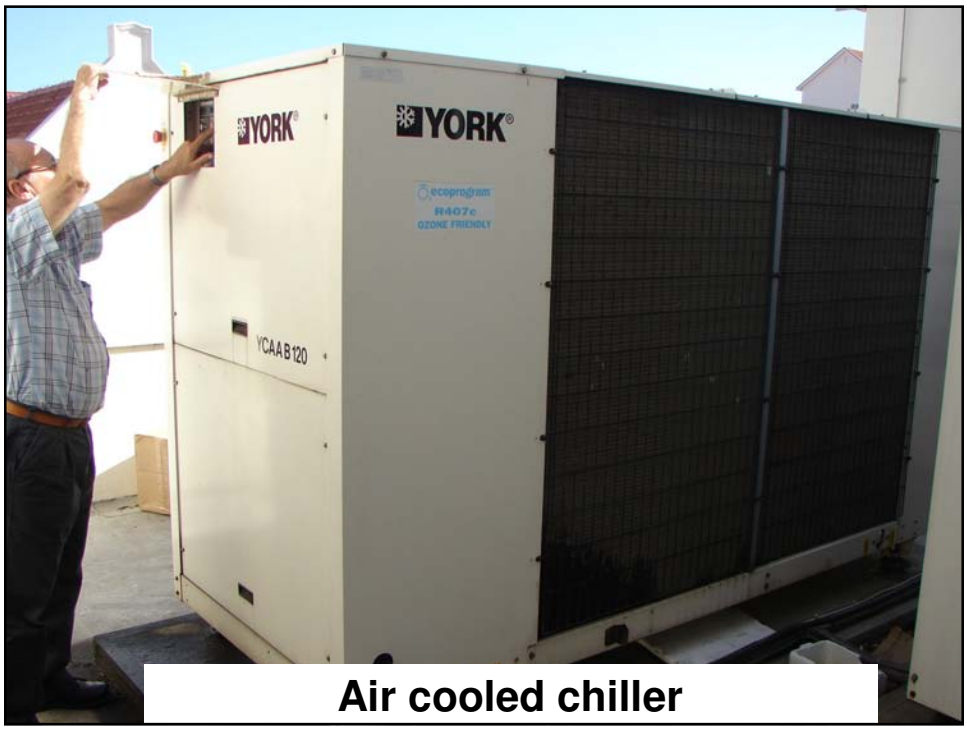
CHILLER COOLING TOWERS

Cooling tower out (condenser in) 29 C

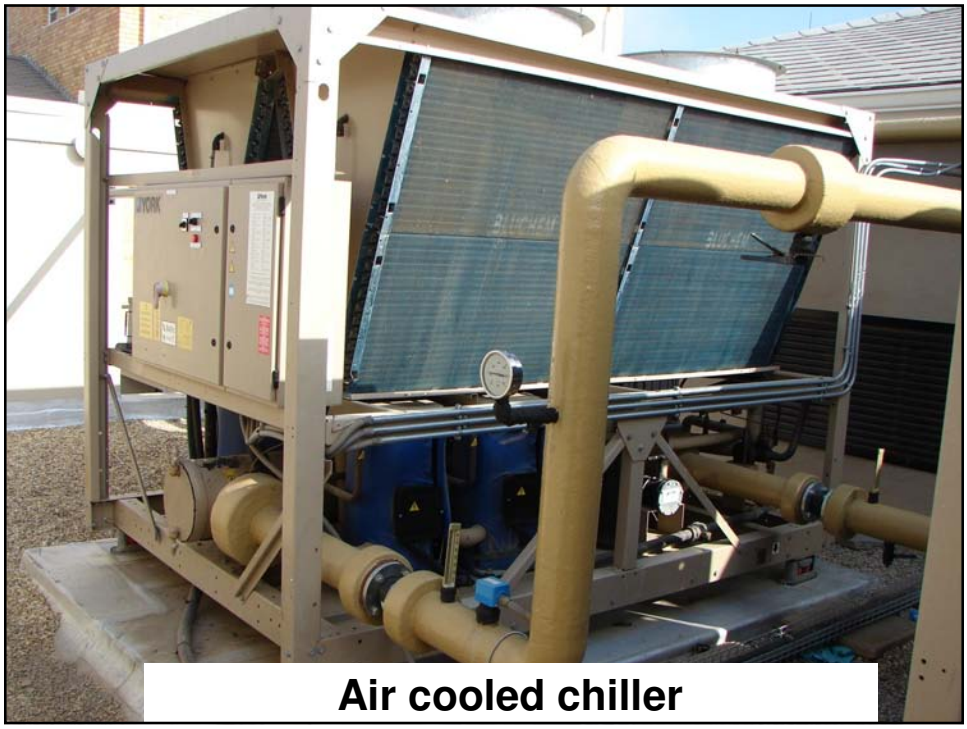
Condenser out (cooling tower in) 36 C



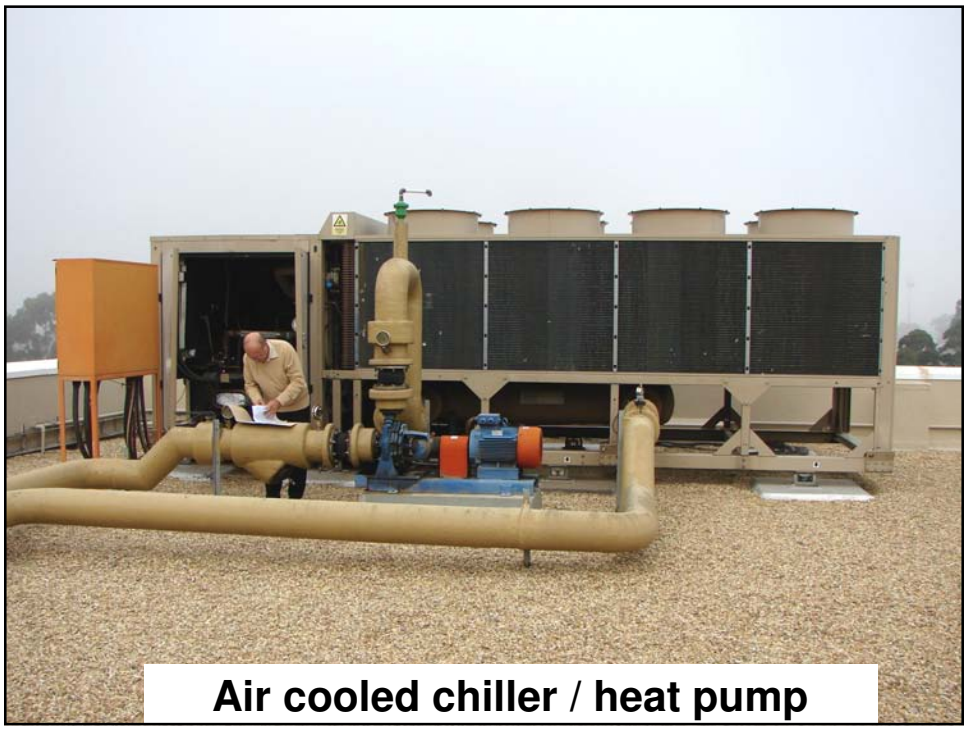
Water cooling towers



Air cooled chiller



Air cooled chiller



Air cooled chiller / heat pump

Split unit air cooled condensers

DOMESTIC WATER HEATING

LEGIONELLA & TEMPERATURE

Destroyed almost instantaneously at 70 C

Decimal reduction time of 2 minutes at 60 C

Decimal reduction time of 120 minutes at 50 C

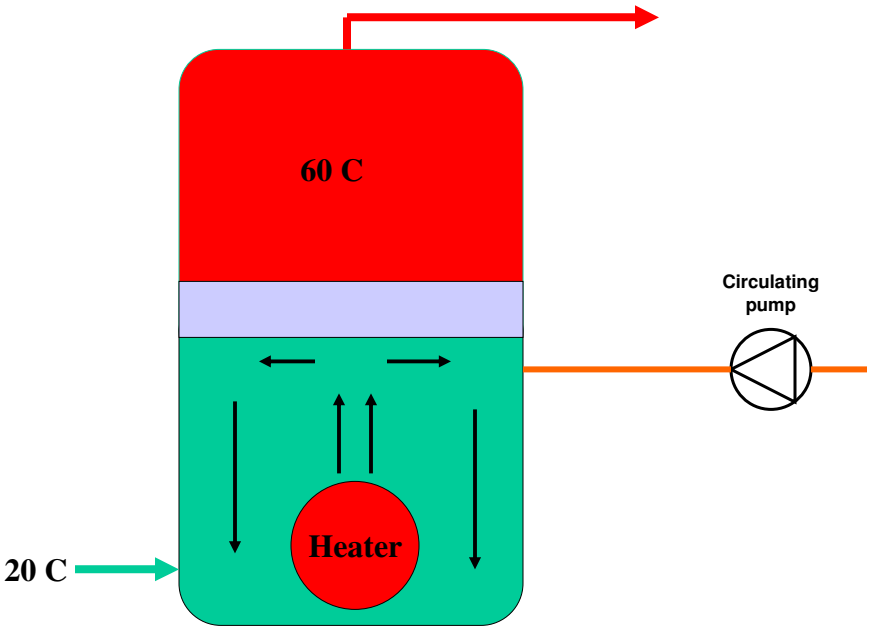
Survive and multiply between 25 C and 45 C

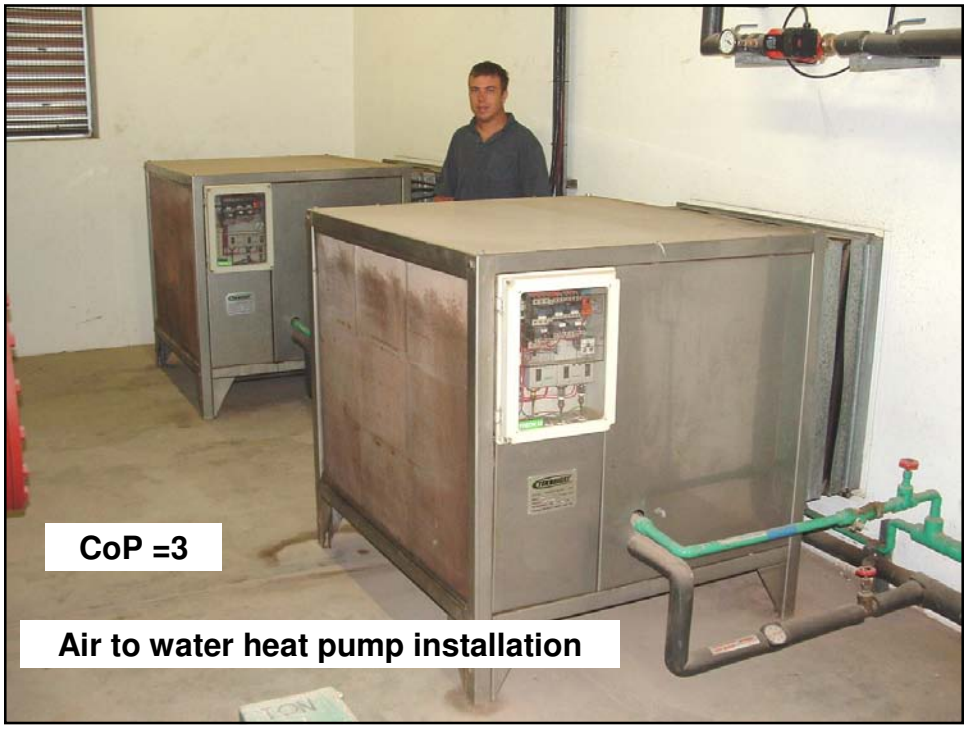
Ideal temperature to multiply 32 C to 42 C

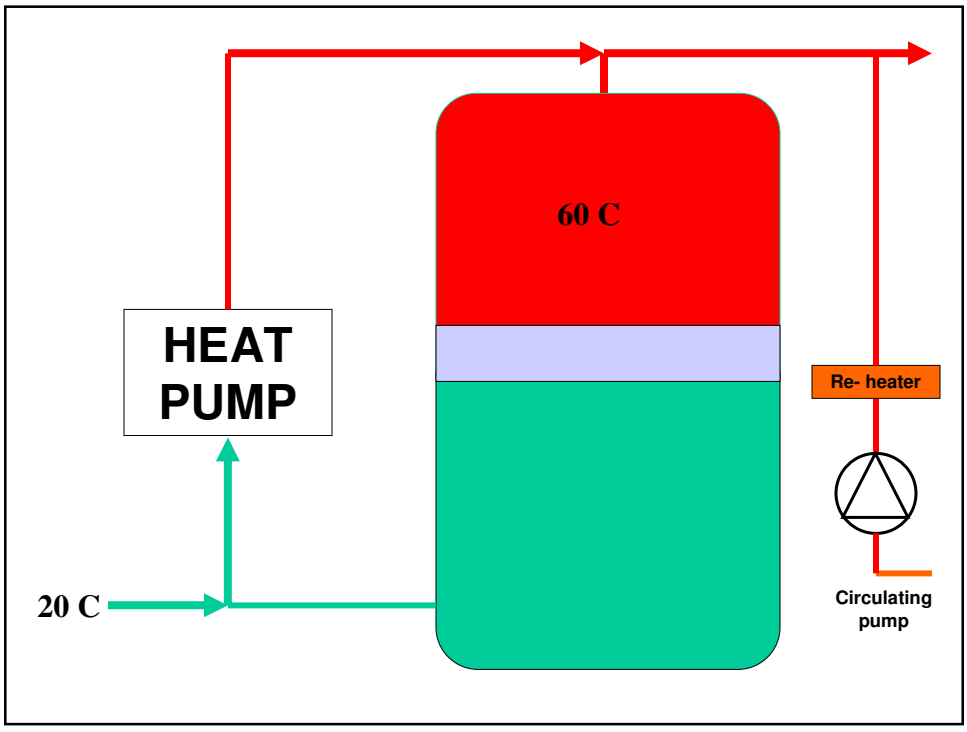
Greatest increase in viable counts 37 C to 42 C

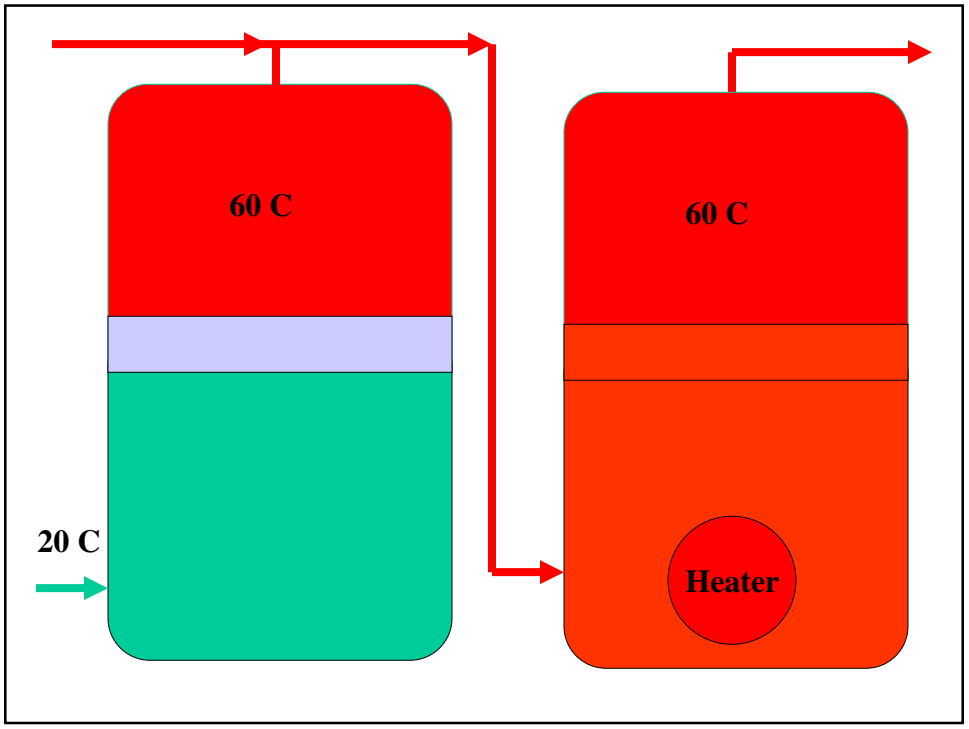
Little or no increase below 20 C


Steam heated calorifier

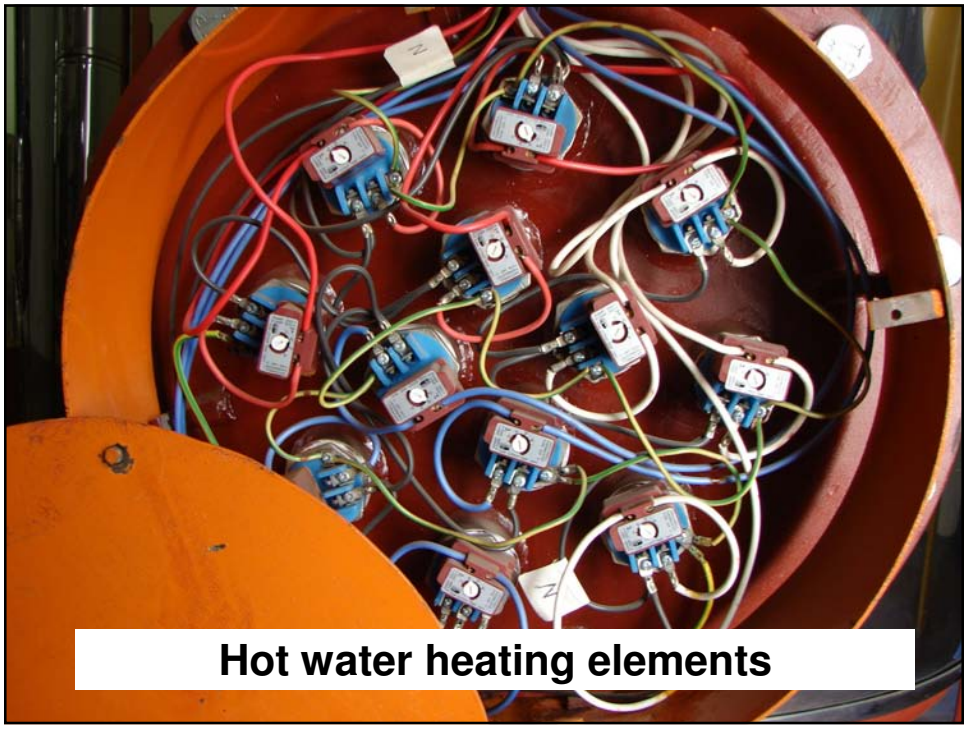

60 C
Circulating
pump
Heater
20 C


CoP =3
Air to water heat pump installation


60 C
HEAT PUMP
Re- heater
20 C
Circulating pump



Hot water storage tanks with electrical immersion heating elements



Hot water heating elements

Domestic Hot Water Cylinders


OUTLET
tecron
ELECTRICS

SWITCHING OFF THE HOT WATER CYLINDER

Actual figures for a family of 3:

Energy with heating on continuously: 8,78 KWh/day

Energy switching off 18 hours/day: 7,98 KWh/day

Energy saving: 0,80 KWh/day

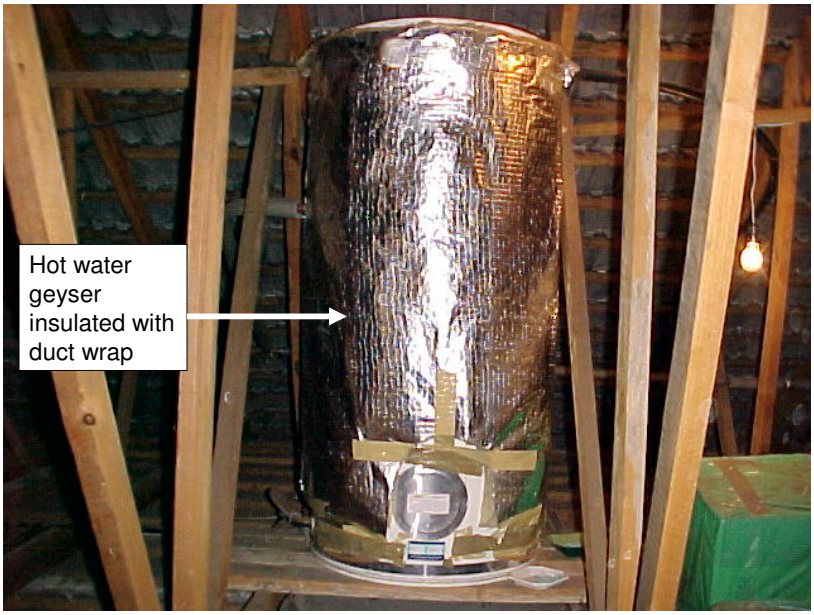
Cost saving: R25-56 per month

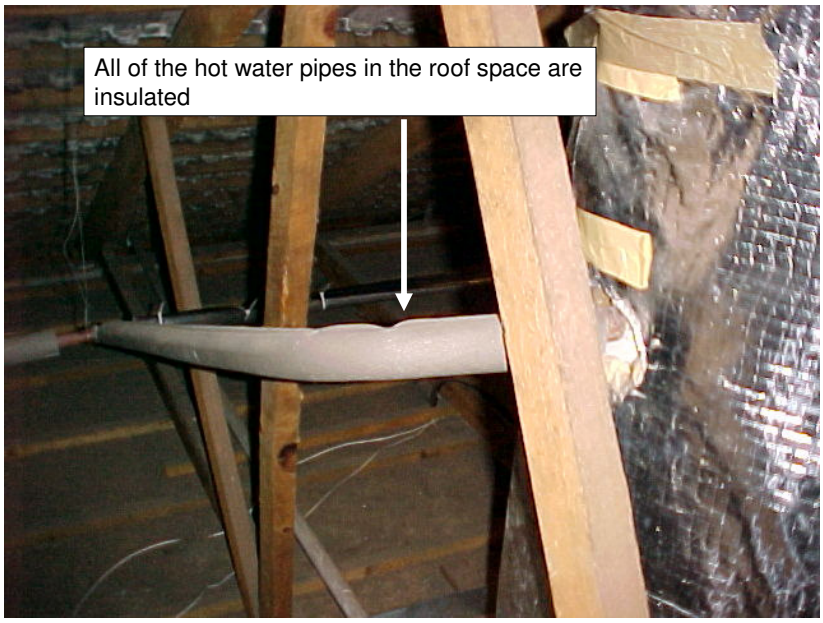
NB. The cylinder is very well insulated.

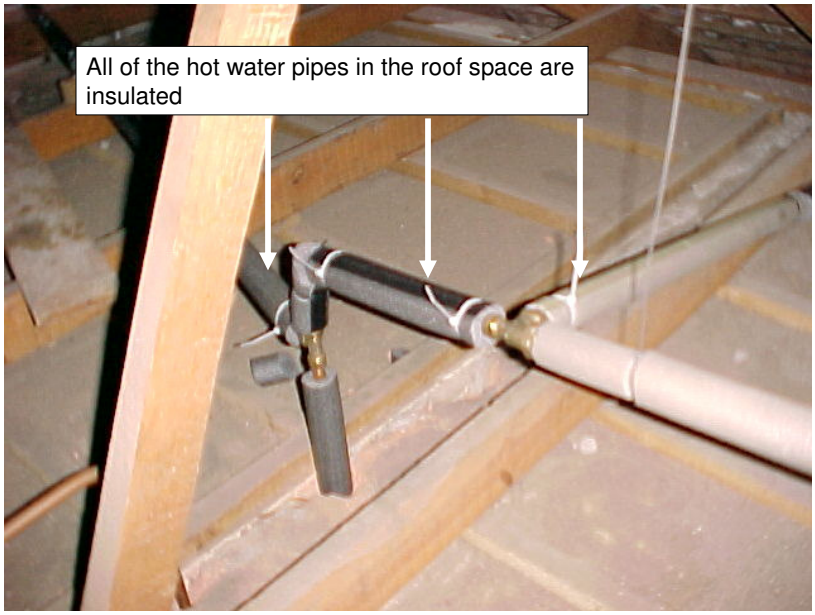
SWITCHING OFF THE HOT WATER CYLINDER

1. Maximum saving is achieved if the heating is switched off after ablutions – I.e. when the tank is cool.
2. Heating should be immediately before ablutions.
3. Heat to 50C for maximum saving.

Result: for approx 18 hours water is stored in the range 30 C to 45 C range.




All of the hot water pipes in the roof space are insulated


All of the hot water pipes in the roof space are insulated

WATER SAVING

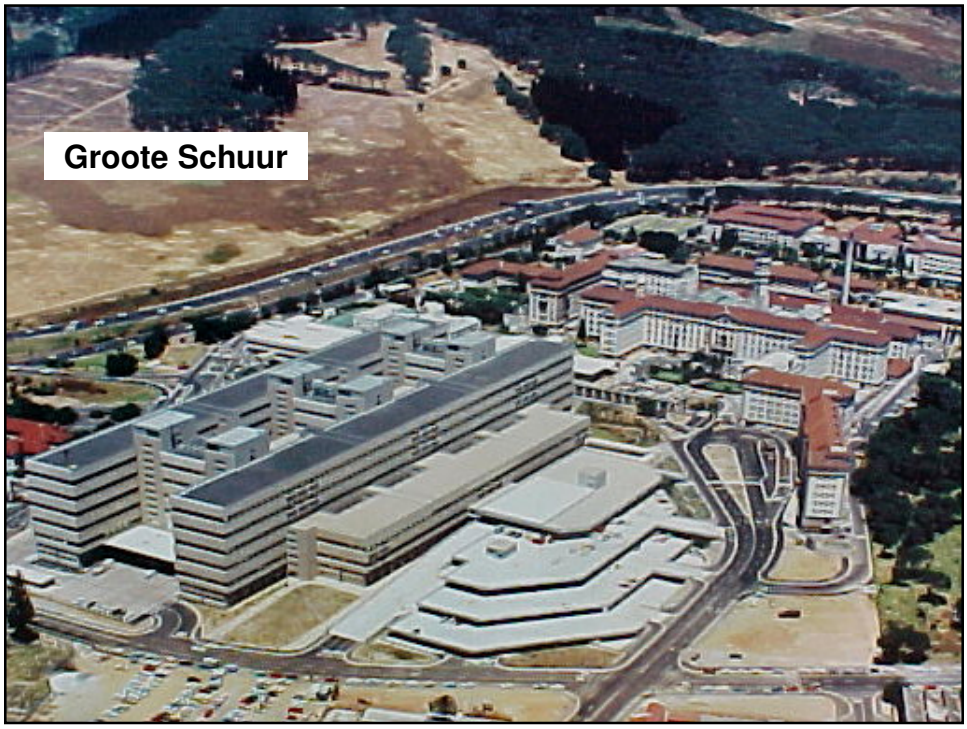
High pressure low flow shower head

COMBINED RISK

COMBINING THE DOMESTIC HOT WATER RISKS

1. Low maximum temperature of 50 C.
2. Biofilm in tanks and pipes.
3. Storage for long periods below 45 C.
4. Showering under low flow shower heads.

Humidifiers


Groote Schuur


CP2
CP2
CP2
Humidifiers

Thank you