DIY Sustainability Survey for Churches – Hot and Cold Water

Introduction

The DIY Hot and Cold Water Survey for Churches is a tool for assessing water use and hot water energy efficiency in church buildings and grounds. As a first level, Do It Yourself (DIY) survey, it is not a replacement for qualified advice from a plumber or water engineer. It covers the situations that were commonly found during the Sustainability Field Worker's in depth sustainability assessments of 10 parishes in the Auckland Diocese from 2012 to 2015. Other technologies such as Heat Pump Hot Water or Solar Hot Water systems etc. are beyond the scope of this survey because, although economies have been established for domestic homes, no research is currently available in New Zealand with regard to churches with their differing water use patterns. See the DIY Sustainability Surveys page of the Cherished Earth website and the website links on the survey pages for more information.

Internal Water Use: Since 2011 new tap, shower and toilet fittings, as well as clothes washing machines and dishwashers, are required to be supplied with a WELS rating to show how efficient the appliance is in terms of water use. This rating gives a star mark out of 6 possible stars.

With regard to toilet facilities, modern dual flush cisterns use approximately 4.5 litres per full flush / 3 litres per half flush. Old cisterns use approximately 11 litres / 5.5 litres per flush. Sensor flush toilets are an additional option. For urinals, a sensor flush or push button control is a good water saving option.

Taps delivering around 6 litres of water per minute are considered to be efficient. To conserve water flow from taps check with your plumber about the possibility of fitting aerators or flow restrictors. This does not apply to kitchen situations where a fast flow rate is required to fill urns etc. If you are having trouble with taps being left on, an auto off feature is helpful, particularly if the taps are often used by children. Modern mixer taps are easier to turn off but have the disadvantage that they draw on hot water when it may not be necessary, especially if the tap is remote from the storage cylinder.

The recommended maximum flow rate for an efficient shower is around 9 litres of water per minute. Installing new, water efficient shower heads or flow restrictors will improve the efficiency of older showers. If the showers are currently supplied by a low pressure hot water system, flow restrictors may not be possible.

For more information on WELS ratings go to the NZ Ministry for the Environment website's Water Labelling Scheme page. If you are considering a bathroom renovation the following WELS Ratings provide a guideline for choice of fittings:

- New taps for hand washing should have a 4 star or better WELS rating
- New toilets should be dual flush toilets with cisterns with a 4 star or better WELS rating. New urinals should have a 3 star or better WELS rating.
- New showers should be 3 star WELS rated. Higher star ratings are not yet applicable to showers while testing methods are being determined.
- In all cases choose the most water efficient appliances (dishwashers etc.) and fittings possible.

External Water use: Rainwater harvesting is suggested as a means of conserving the water used for gardens. If your church has a community garden then investigate grants and external funding sources to cover a rainwater harvesting system. The installation of tanks must comply with building code and local body bylaws for tanks.

Water Temperature: The thermostat in a storage HWC is required to be set at not less than 60º C to prevent the growth of Legionella.

Kitchens and Laundry areas – Hot water to these areas is not required to be tempered with cold water and temperatures between 55º C and 65ºC are accepted. However the risk of serious scalding increases above 55º C, and particularly above 60ºC, therefore Homestar recommends 55º C as being a safer and slightly more efficient temperature. A higher temperature is not necessary if there is a Sanitizer or dishwashing machine in the Kitchen. Ensure that any dishwashers are set to 'Eco' mode to economise on water and energy use.

Bathrooms – The regulations that relate to hot water supply to sanitary fixtures for personal Hygiene (Building Code Clause G12, baths, basins and showers) state the maximum allowable temperatures. The maximum to any sanitary fixture in childhood centres, schools, institutions for the elderly and for people with mental or physical disabilities and hospitals is 45º C. For all other buildings it is 55º C. According to the Health and Safety Guidelines for Early Childhood Education ECE_February 2013, warm water delivered to taps that children can access should not be hotter than 40º C. The Guidelines state that the water should be at a comfortable temperature for children to use and that warm water encourages children to wash their hands. For a church then, the hand basins in bathrooms are allowed to be cold water only. However, providing warm water is more comfortable for users and especially for children and will encourage hand washing and reduce the spread of infection.

Hot Water Boiling units:

Kitchens in church facilities often have Hot Water Boiling Units (usually electric) to provide instant, very hot water for making hot drinks for large numbers of people. It is important that these units be modern for several reasons:

1) Modern units store the water at just below boiling point and have built in 'Eco' features to maximise energy efficiency.
2) Modern units are well insulated to prevent heat loss.
3) Old units allow steam to escape into the kitchen space when the water is boiled which adds to the humidity levels in the air, which contributes to mould growth and deterioration of the building fabric. By contrast, modern units condense the steam within the unit and then drain this to a nearby sink or directly into a sink drainage pipe.