



Circular 0046/2008

To all Primary and Post Primary schools

Guide to water efficiency in schools

1. Purpose

The purpose of this guide is to advise schools on the most appropriate measures to minimise excess consumption of water and to reduce wastage where it exists.

2. Water Management Plan

The first step in reducing unnecessary water usage in your school is to have a water management plan.

The water management plan will allow you to be familiar with the water distribution systems serving the school and the areas where water is used along with potential areas for wastage and leakage.

The water management plan should include the following

- Using a drawing of the school (this may be available in the schools safety files if relatively new, if not use the same block type plan as you have used in the fire safety plan for your school) mark out the location of the water meter and the external pipe runs in the school grounds (the local authority may be able to assist in this matter). It is also important that any fire hydrants etc used for fire fighting purposes are identified and that appropriate safeguards are put in place to ensure that the water supply to these fittings is never isolated.
- Establish average water usage patterns by taking water meter readings regularly, where easily and safely accessible (check with the local authority that your meter is sized correctly for your school) and keep a log of all dates and readings. Prompt action should be taken if you notice an increase in usage or if the meter malfunctions.
- Check if there are permanent damp patches evident in the school grounds, these may indicate an underground leak.
- Water usage will vary depending on local school usage patterns; typically a reasonably generous water usage in a school would be 19 litres per pupil per day (3,500 litres or 3.5m³ per pupil per year). A realistic guide for new schools would be 12 – 14 litres per pupil per day (2,000 – 2,600 litres or 2.2 m³ – 2.6 m³ per pupil per year). Schools with sports facilities will vary depending on shower usage etc.
- Newer schools have a water meter provided underground where the mains water supply enters the school grounds and a second meter above ground on the incoming mains water pipe to the school building (usually in the boiler room). By

comparing both readings, where easily and safely accessible, you will be able to ascertain if there are any leaks on the interconnecting external water mains pipe.

- Arrange to check the meter, where easily and safely accessible, when the school is not in use, there should be no water consumption at this time, if the meter is recording usage then there is a leak somewhere or systems in use that shouldn't be and further investigation is required.
- Ensure water pressures and flow rates are set at minimum required settings.
- Try and minimise water consumption through the use of water saving devices, urinal controls and push button type taps etc as detailed in the next section.
- Ensure that the cleaning and caretaking staff is aware of the school's water conservation ethos and use proper mop buckets etc rather than running taps excessively.
- Encourage pupils and staff to save water by correctly using taps and turning off taps etc when not required. It is possible to minimise water use in your school through both changes in behaviour of pupils and staff and the use of water saving technologies.

Changes in behaviour of pupils and staff can be developed through awareness projects in the school led perhaps by the school Green Team.

There are many websites with assistance available, some are noted at the end of this document, most local authorities have water conservation advice available on their websites, and one particular example is Dublin City Council available at www.dublincity.ie under the Waste, Water and Environment section.

This site contains a downloadable education pack in the form of information sheets for water conservation in schools.

A pilot project in Gorey Community School has reduced its daily water consumption by more than a third by fitting urinal controls, cistern dams and self closing taps with a reported payback of less than eighteen months. A report on this project is available at http://www.wexford.ie/wex/Departments/Waterservices/DownloadsAdviceNotes/Tfile_4550.en.pdf

Galway County Council is producing a DVD titled 'OUR WATER' in conjunction with primary schools in Galway City. This short production will show children where our precious water comes from, how the water is intensively treated before getting to homes and schools, and where it goes after it is flushed down the drain. Finally, it will also show how the water is cleaned at the Mutton Island Wastewater treatment Plant before returning into the cycle again. They also currently have a funding programme for the provision of water saving devices.

- Plan and conduct regular checks on fittings and taps and repair any leaks and replace any faulty washers.
- It is difficult to maintain reduced water consumption as it is not as visible an issue as litter and waste. By regular monitoring (weekly) you will know if and when changes in water consumption (up or down) occurs, remember a big leak can cost the school a lot of money in a very short time. You should endeavour to maintain the success of your water management and to continually promote awareness.

3. Ways of conserving water

Water demand in schools arise typically from appliances, urinals, toilets, taps, showers, water used to maintain the school grounds and water leakage.

Appliances

- Ensure that when buying appliances for washing etc that the most water and energy efficient machines are purchased.

Urinals

- **Installing automatic flushing systems**

Older schools that do not have any control devices on their urinal cisterns could benefit considerably by installing cistern flush controllers. A urinal without controls will simply keep filling and flushing water 24 hours, seven days a week and are very wasteful. Urinal controls are based on presence detection and only flush the urinals after use (they will also have a setback programme to ensure minimum flushing for hygiene purposes during school holidays).

Toilets

- **Variable flushing devices**

These are retrofitted devices which allow pupils having flushed the toilet to press a button when the toilet bowl is clear; the depressed button will then interrupt the flush and stop unnecessary water wastage. They are relatively easy to fit, requiring no plumbing or maintenance. They are not suitable for concealed or built-in toilet cisterns.

- **Water dams and displacement devices in WC's**

Water dams and displacement devices reduce the amount of water that can fill the cistern and thus act as a water displacement device.

They are appropriate for older cisterns, toilet cisterns with a 7 - 9 litre flush (usually installed 1993-1999) have the potential to save up to 1 litre per flush. Toilet cisterns with a 9 litre flush or greater (usually installed pre1993) have the potential to save up to 3 litres per flush. They should not be used on modern low volume cisterns and may not be appropriate in some cases where drains may be in poor condition.

- **Installing reduced flush toilets**

Replacing a 9 litre flush toilet with a dual flush toilet with 3 and 6 litre flushes can save up to half the water used for WC flushing.

- **Ball valves and overflows**

Ball valves and overflows on WC cisterns should be checked regularly. Some cisterns have an externally piped overflow and some have internal overflows. With an internal overflow the spill over is into the bowl. Ball valves on the schools large cold water storage tanks should be checked annually at the same time that the tanks are being inspected and cleaned.

Taps

Leaking taps can usually be repaired by replacing worn washers.

- **Self-closing taps**

Taps left running waste enormous amounts of water. Consider replacing conventional screw taps with percussion taps that close automatically after a preset period of between 1 and 30 seconds, thus reducing the possibility of taps left running. Some models also have a flow rate restrictor which can be used to deliver a lower flow rate than conventional taps. Self-closing taps need to be inspected and maintained regularly. It may be possible to just change the tap head without having to disturb the tap body or wash hand basin plumbing.

- **Spray taps**

Spray taps can save up to 50% water consumption. Spray taps need to be inspected and maintained regularly to make sure there is no soap, grease or lime scale blocking the spray outlet.

Showers

Showers left running waste enormous amounts of water. Consider replacing conventional shower controls with percussion controls that close automatically after a preset period of time. Self-closing controls need to be inspected and maintained regularly.

Water used to maintain the school grounds.

If you use a very significant amount of water for watering school grounds or playing fields, you should discuss with your Local Authority whether it would be worthwhile to pay for a separate water supply connection and meter for this purpose, so that you do not have to pay the waste water element of the charge on this usage. There may also be a local water supply on the school ground that while not appropriate for drinking may be suitable for watering the grounds.

Water butts collect rainwater from down pipes connected to the school buildings guttering. It is worth considering installing water butts for use on the external grounds, child safety should be paramount with access to the butts internal water volume totally restricted via locked lids.

The application of mulch around plants and flower beds can conserve water by reducing surface evaporation (it also helps control weed growth). If the soil is heavy clay the incorporation of a mixture of organic matter and sharp sand or grit will open up the ground and help water retention, thus reducing the soil cracking during a dry summer. If the soil is free draining a mixture of organic matter will also help water retention.

Too much water on grass encourages surface rooting and exposes the grass to drought damage. The most efficient way to protect a grassed area in dry weather is to adjust the height of the mower blades to 4 cm to encourage dense growth that allows the morning dew to be trapped. Cutting the grass less during dry weather and leaving the cuttings on the lawn will promote the return of moisture and nutrients to the soil.

Rainwater and grey water recovery and use in schools

There is good potential for recovering or harvesting rainwater in schools to use for flushing toilets and where feasible these systems are provided for in new school projects. Retro-fitting rainwater recovery into existing buildings is not possible without major intervention into the internal fabric and services of the building (dedicated water supply to every toilet in the building) and external drains (separating rain water and external drains and re-routing to a central collection point).

Grey water is defined as all waste water from non-process appliances and fittings excluding waste water from toilets and urinals. It includes waste water from kitchen sinks (sometimes excluded), wash hand basins, baths, showers, washing machines and dishwashers. There are obvious hygiene issues that require careful consideration and treatment and this combined with the fact that in a school very little grey water is produced in comparison to the demand for toilet flushing the potential for grey water recovery in schools is not really viable.

4. Next Steps

To find out more about any of the above technologies contact your local plumbing suppliers or plumber or enter any of the above subheadings into an internet search engine along with the word school to find details of suppliers etc.

The costs involved in implementing water conservation measures should not be very high and can generally be undertaken by a local plumber rather than requiring the assistance of a Consultant Engineer. Existing funding streams such as the annual minor works grant at primary level and the capitation or support services grant at post-primary level should be sufficient to enable the bulk of any necessary conservation works to be done during 2008 and 2009.

The transitional arrangements afford schools the opportunity to put in place the necessary water conservation arrangements and practices and undertake necessary works to ensure that when usage based water charges are introduced from 1 January 2010 schools will have significantly reduced their water usage and, by virtue of good water conservation, be in a much stronger position to meet their water charges. Those schools with very high water consumption are to be identified by the relevant Local Authorities and this will facilitate investigation of causes and any necessary follow-up actions including, if necessary, additional capital assistance from the Department to those schools for conservation works that cannot be met from within existing funding levels.

5. Additional Information

For additional energy saving information and school case studies visit the following websites:

- www.sei.ie
- www.powerofone.ie
- www.greenschoolsireland.org
- www.eco-schools.org
- www.dublincity.ie
- www.taptips.ie
- www.slowtheflow.ie

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