

CHUN LEE ENGINEERING CO LTD

By Mr. Lewis Chung

Published in FEMC Newsletter

Ways To Save Energy For Water System

The Water System

Different measures and ideas are discussed to improve our environment by different parties and government. The water distribution system inside building is usually ignored as a potential energy conservation resource. Saving water in a way is to save energy. As an plumbing engineer, we should try to improve our environment by reducing the use of water. Generally, the techniques in saving water in a water system can be divided into three categories: household, the estate management and the system design.

The Design of Water System

Pipe Routing

Better Pipe routing will lead to reduce number of bends used and hence lesser frictional loss.

Consider Increasing Pipe Insulation Thickness

Many older buildings were built at a time when energy was inexpensive. The hot water piping may not have been insulated at all, or it could be wrapped with a minimal thickness. A high quality product is available that is more efficient and durable. Pipe routed through unconditioned spaces such as the pipe basement or attic should not be without insulation.

Install a Separate Water Heater for the Kitchen or Laundry

A sophisticated hot water system, in a hospital for example, will be designed to supply 82°C water to the kitchen and laundry and 48°C water everywhere else. Many buildings will simply supply the hotter water everywhere, at great waste – and sometimes great danger, from the scalding hot water.

For smaller heater, it should be locate close to points of use – long hot water pipes waste hot water.

Reduce Volume of Waste Disposal Methods

Specify a smaller toilet flush tank or dual flush device to reduce the volume of water used with each cycle.

Eliminate of High Water Pressure Hazards and Nuisance Leaks

High pressure will cause excessive flow rates and waste of water in showers, toilets, rinse cycles of dishwashers and washing machines, and in any operation where water flows freely to the drain.

Use of Variable Speed Pumps for Plumbing System

Variable speed pumps can be controlled to maintain a constant service pressure while traditional boosters with pressure switch control will inevitably over-pressure the system during the switching on and off. More energy is conserved and more expenses for electricity.

The Estate / Property Management

Inspection for Leaks

A simple way to reduce water usage is to be alert for leaks in pipes, fittings, pumps and gauges in mechanical rooms and at distribution pipes throughout the building. Faucets and other restroom fittings are also important locations to inspect for fluid loss. Swift repair of these water leaks will prevent collateral damage to wood surfaces and furnishings, ceiling tiles and electrical equipment. The savings will occur in the water bill and in a lower sewage disposal fee as well.

Leaks that occur in closed systems can be even more expensive. Water circulating in the chilled water loop, the swimming pool, the condenser water loop and the steam loop is usually chemically treated for corrosion and high hardness. Water lost from these systems loses valuable chemicals as well, which increases the treatment costs. In addition, the energy needed to heat or cool the circulating fluid will rise since a portion of the energy spent is lost with the leakage of hot or cold water.

Inspect and Repair Damaged Insulation Systems

Sagging or missing sections of insulation should be promptly attended, as they are not only an energy loser but may also indicate a leaking pipe in need of repair. If the insulation is worn because it covers a pipeline in a heavy use area the insulation should be replaced, then covered with a sheet metal sleeve to prevent future damage.

Insulate Hot Water Heater and Storage Tank

If the heater is located within the conditioned space, heat emanating from the unit will add to the load on the air conditioning equipment. If it is located outside – and is poorly insulated – much heat will be lost in the winter to the environs. In either case it is important to maximize insulation.

Install Flow Restrictors at Hot Water Faucets and Shower Heads

This is another effective way to reduce water usage. To compliment such measures it is helpful to promulgate a general philosophy of water conservation, especially in the kitchen. People tend to think of water as an inexhaustible resource, not realizing the energy is saved by not wasting hot water.

In Household

Clothes Washing

- Use cold water as much as possible
- Wash a full load rather than several smaller loads
- Separate heavily soiled clothes from lightly soiled ones

Clothes Drying

- First and foremost – use a clothes line or rack instead of a dryer as much as possible.
The sun's energy is free!
- Spin clothes as much as possible before placing in the dryer
- Use the correct temperature setting for the type of clothes

Cooking

- Use small appliances where possible – use the microwave over a conventional oven, the toaster over the grill, the kettle over the hotplate.
- Match the size of pots to the size of the element or flame area
- Boil only the amount of water you need
- Let frozen foods thaw before cooking
- Keep preheating times in electric ovens to a minimum. Preheating is not necessary in a gas oven

Hand Washing and Shower

- For Shower, use massage mode more frequently
- Use the plug in basin – don't leave water tap running