

WATER-EFFICIENT LANDSCAPE IRRIGATION FOR CALIFORNIA SCHOOLS

INTRODUCTION

California schools using conventional irrigation methods may benefit by retrofitting advanced irrigation technologies. These high tech systems can potentially conserve up to 50% of the irrigation water required for recreational and non-recreational landscaping compared to baseline. This strategy may prove to be more cost-effective than alternative solutions such as re-landscaping, installing artificial turf, or developing alternative irrigation water systems.

STRATEGIES FOR REDUCING TREATED MUNICIPAL WATER IRRIGATION USED FOR SCHOOLS AND COLLEGES

It is estimated that 30 to 60% of urban water use in California goes to irrigate landscaping. The major strategies to reduce outdoor urban water consumption are as follows:

1. Use recycled waste water instead of municipal treated water for landscape irrigation. Treated recycled water is a safe substitute for potable water for irrigation. In California, about 669,000 acre-feet of treated recycled water was re-used in 2009, mostly in the southern portion of the State.
2. Irrigated landscape areas can be modified to reduce evapotranspiration. Examples include alteration of soil characteristics to absorb and hold more water and replacing lawns with less water-intensive climate adapted plantings.
3. Installing or upgrading “water smart” irrigation technology is a proven water-saving best practice. Water-efficient landscape irrigation is the focus of this product profile.

FOCUS ON WATER SMART IRRIGATION

Schools and Colleges that are using conventional irrigation systems may find that upgrading to “water smart” irrigation systems is the most direct and cost-effective means of meeting water saving targets. Conventional landscape irrigation systems waste up to 50% more water compared to systems that represent existing best practices. Technological advances in irrigation systems now offer substantial water saving potential without altering the existing landscape design. In general, water-efficient irrigation is the product of careful water management and water distribution uniformity. The following advanced devices, capabilities and features are often included in highly efficient irrigation systems:

SPRAY HEAD LAYOUT & DESIGN

Spray heads in conventional irrigation designs are often laid out with too much redundancy (overlap) and too much pressure. Careful planning of the layout can reduce this problem.

High line pressure can cause misting which leads to non-uniform distribution, and often allows overspray to travel to buildings or travel off-site. Pressure regulating sprinklers are one solution to excessive misting which can save water usage by 6-8%.

Rotor systems are preferable to spray heads to minimize flow rate and avoid runoff potential. Rotors are now designed to serve a radius as small as 15 feet.

SPRAY HEADS REPLACEMENT WITH DRIP IRRIGATION

Spray Heads are not as effective as drip systems for trees and shrubs. There are even retrofit kits for converting spray heads to drip systems.

DEVICES THAT CONTROLLING WASTEFUL DRAINAGE & PIPE LEAKAGE

Manual shutoff valves close to the point of connection to water supply are required by the prescriptive standards of the Model Water Efficient Landscape Ordinance.

Spray heads with check valves prevent water from draining out of sprinkler heads at low elevations.

Master valves installed between the backflow device and the first control valve to prevent unnecessary water leakage.

Flow sensors compatible with the smart controller alerts the user when water exceeds a pre-set amount and shuts down the system to control water loss from a broken pipe.

SOIL MOISTURE SENSORS

This capability is available in new systems or as a retrofit. This feature alone can save 30%—70% on water bills during the irrigation season. The sensor measures soil moisture and communicates with the water controller or timer to ensure that water is not wasted. This device is required by the prescriptive standards of the Model Water Efficient Landscape Ordinance.

RAIN SENSORS

This monitoring device shuts off programmed water cycle after a pre-set amount of rain has fallen. It can be purchased as a package with the soil sensor.

WEATHER STATIONS

This device provides current weather site conditions to the controller. This information is matched with soil requirements to provide the optimum irrigation requirements.

SMART CONTROLLERS

These controllers are able to process multiple data from soil sensors, rain sensors and weather stations. They are programmable to irrigate microclimates throughout the landscape. This device is required by the prescriptive standards of the Model Water Efficient Landscape Ordinance.



RESOURCES & REFERENCES

DSA Outdoor Water Use Regulations
www.dgs.ca.gov/dsa/Programs/progSustainability/water.aspx

EcoFriendly Irrigation <http://ecofriendlyirrigation.com>

Regional Water Providers Consortium www.conserveh2o.org

Australian National University <http://sustainability.anu.edu.au>

LM Landscape Management <http://landscapemanagement.net>

St. Hilare, R., et al., "Efficient Water Use in Residential Urban Landscapes"
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