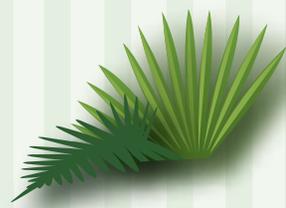


Creating a Green and Profitable Work Environment



An informative guide to "green" cleaning and maintenance practices which provide efficient, productive and healthy operation of commercial buildings in Florida.

2003



Creating a Green and Profitable Work Environment

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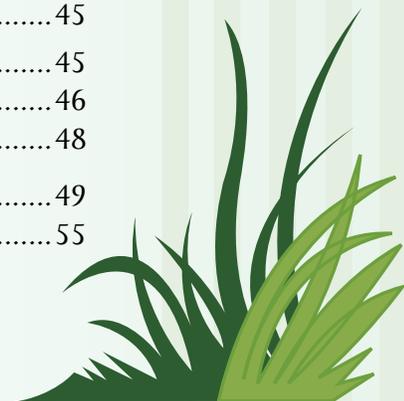
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6.0 Identify Opportunities III – Housekeeping and Maintenance and Building Water Use

Chapter Highlights

- Strategies to reduce indoor water use.
- Strategies to reduce outdoor water use.

6.1 Indoor Water Use

Section Recommendations:

- Retrofit older fixtures with EPACT compliant models.
- Use conservation devices in existing fixtures such as aerators and water displacement devices if fixture cannot be upgraded.
- Consider automatically controlled water fixtures.
- Monitor all water fixtures and piping for leaks.

Primary sources of water consumption inside commercial buildings are found in restrooms, and to some extent, food preparation and eating areas. The largest potential for savings is often found in buildings constructed before 1992 with fixtures that do not comply with the Energy Policy Act (EPACT) requirements. The Energy Policy Act of 1992 placed maximum flow requirements on all water fixtures, and effectively required their use. Upgrading to EPACT compliant fixtures can have a significant impact on water use. Water faucets used primarily for hand washing should consume no more than 1.5 gallons per minute of water. If the fixture cannot be changed, a faucet aerator can be installed that effectively lowers the flow of a high flow faucet. Urinals should use no more than one

gallon per flush, while toilets should use no more than 1.6 gallons per flush. Urinals and toilets that pre-date EPACT could easily be using 3-5 gallons per flush. As shown in Table 6, savings achieved by retrofitting older urinals with EPACT compliant models can be substantial. Performance of older toilets that have tanks can also be improved with water displacement devices, such as toilet dams, bags, or weighted bottles, in lieu of an equipment retrofit.

If upgrading older water consuming devices, consider upgrading faucets, urinals and toilets to automatic models. Automatic faucets limit the length of time water flows during any one activation, and ensure flow is not inadvertently left on. Automatic urinals can be programmed to operate under a water saving mode that flushes the urinal after more than one use. As previously discussed, automatic equipment aids with disinfection activities due to “touch-free” operation.

Maintenance routines should also be aimed at conserving water. All water fixtures should be monitored for leaks, and as with other



Figure 21. Automatic faucets limit the length of time water flows during one activation, thereby ensuring flow is not left on.

Eric Martin, FSEC

Table 6. Projected annual water savings per urinal obtained from retrofit of three gal/flush units to one gal/flush units for three building types.

| Building Type | Number of Males | Number of Urinals | Uses per Day | Days used per Year | EPACT savings per Flush (gal) | Average Annual Water Savings per Urinal (gal) |
|---------------|-----------------|-------------------|--------------|--------------------|-------------------------------|---|
| Small Office | 25 | 1 | 3 | 260 | 2 | 39,000 |
| Restaurant | 150 | 3 | 1 | 360 | 2 | 36,000 |
| School | 300 | 10 | 2 | 185 | 2 | 22,200 |

Source: Adapted from Environmental Building News Vol. 7, No. 2, Feb. 1998.

concerns this guide addresses, a system set up for occupants to report leaks. A leaking toilet can waste more than 50 gallons of water each day, and a dripping faucet can waste up to 1,000 gallons per week. Water bills should be monitored, for an unusually high bill may indicate a leak.

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For assistance with conducting a water audit of your building that can uncover opportunities for water

conservation, consider contacting the local water management district for assistance and resources. Contact information for all five of Florida's water management districts can be found on the web at: www.dep.state.fl.us/secretary/watman/index.htm. Rebuild Florida, as previously described, can also assist with water efficiency retrofits and strategies.

6.2 Outdoor Water Use

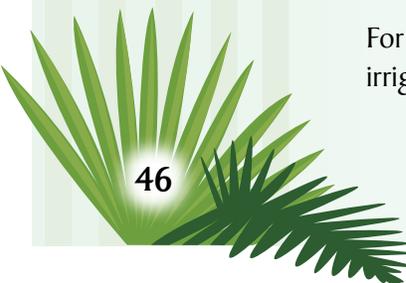
Section Recommendations:

- Practice "Florida Friendly" landscaping and irrigation practices.

For commercial buildings in Florida with an irrigated landscape, a significant amount

of water is consumed throughout the year in order to maintain the plant material in the landscape. Much of the water used for irrigation has been treated by a municipality to potable standards, which consumes chemicals and energy for treatment and distribution. Both commercial and residential buildings alike are charged for use of this water, and are also often assessed sewer charges, even though water used in the landscape does not directly enter a municipal sewer system. Implementing "Florida Friendly" landscape and irrigation practices outside of a commercial building has the potential to reduce water use anywhere from 20% to 60%, depending on initial conditions and procedures. This strategy, as promoted by the University of Florida's Florida Yards and Neighborhoods Program (FY&N), places emphasis on the use of low maintenance plant material and landscape design. Florida friendly landscapes not only require less water, fertilizer, and pesticide to maintain, but also require less human interaction to maintain, resulting in further labor and personnel savings.

Lower fertilizer and pesticide requirements enable Florida friendly landscapes to also contribute to the protection of the quality of Florida's fresh water resources. Storm-water runoff is the reason. Rain falls on landscapes, roads and parking lots, and then washes into various tributaries, carrying pollutants like fertilizers, pesticides, soil, and



petroleum products. Fertilizers and pesticides from commercial as well as residential areas have become serious threats to the health of Florida's waters. When runoff contains nitrogen from fertilizers, algae can become so abundant that sea grasses are smothered, oxygen is depleted, and fish kills may result. In some freshwater environments phosphorus is often the nutrient responsible for algae blooms. Toxic substances, such as common landscape and household pesticides, can damage reproduction in marine life.

To assist with the preservation of the quality and quantity of Florida's water resources, the FY&N program was created and maintains an office in the extension service of nearly every Florida county. Coordinators are available to provide free assistance to building owners and managers who are interested in creating a Florida friendly landscape, or looking for Florida friendly tips and techniques to maintain their existing one. To obtain contact information for the program in your county, visit <http://hort.ufl.edu/fyn/count.htm> on the web, or look up the phone number for the extension service in your local phone book. FY&N operates a certification program whereby those who incorporate enough of their principles can achieve the designation of maintaining a "Florida Friendly Yard".



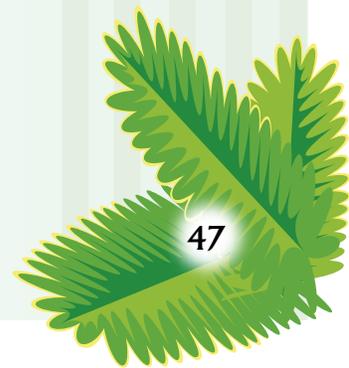
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Figure 22. Florida friendly landscapes place emphasis on the use of low maintenance plant material and landscape design.

Some of the principles that lead to water and maintenance savings in a commercial landscape include selecting the correct plant material according to landscape conditions, watering efficiently, utilizing mulch to retain water, and applying appropriate amounts of fertilizer.

Plant selection is an important aspect of maintaining a Florida Friendly landscape and will determine the level of maintenance required, how much money will be spent on water or electricity to run a pump, and how much fertilizer or pesticide may be required. Plant selection also will determine how long your landscape will last. Fast-growing plants often have a shorter life span than slower-growing species. Plants should be selected on the basis of soil conditions such as pH, as well as sun/shade conditions to ensure they can thrive with little addition of water, fertilizer, and pesticide. Plants with similar requirements should be grouped together. Native plants are well adapted to local conditions and greatly minimize maintenance requirements, as do drought tolerant plants. Mulch should be applied 2-3 inches deep around plants, extending to the drip line of trees. Leave some open space near the plant base. Mulch assists with water retention and weed control. Turf is the largest consumer of water and chemicals in the landscape, and should be limited if not all together excluded and replaced with mulched plant beds or groundcovers. If turf is desired, a drought tolerant species should be selected. Turf areas should be evenly shaped and no turf should be placed on berms for effective watering. Trees and other tall

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plants are excellent at providing for a shady landscape that will consume less water, and have the potential to reduce energy costs by shading the building.

As previously mentioned, plants should be placed at least two feet away from the building foundation to minimize moisture accumulation.

Proper plant selection and placement can provide for a landscape that, once established, survives primarily on rainfall and requires no supplemental irrigation. If irrigation is installed, certain steps can ensure water is applied effectively, rather than wastefully. The system should be calibrated to apply no more than $\frac{3}{4}$ inches of water per application, which should only be applied 1-2 times per week. Most plants, including turf, will not benefit from more than $\frac{3}{4}$ inches of water per week and excess watering on a regular basis can promote shallow root growth and weaker, disease prone plants. A rain shut-off device should be installed on automatic systems, and turf areas should be watered separately from plant beds. Consider using micro or drip irrigation for plant beds rather than sprays or rotors.

If a plant is appropriate for the soil and site where it is located, it may not require additional nutrients from fertilization. Fertilizers are generally used to achieve a specific goal such as more or larger blooms, faster growth, greener leaves, or more fruit. If it is determined that nutrients are required to maintain healthy growth, try to locate a source of compost that will provide additional benefits in the soil along with providing nutrients. If compost is not available

a basic fertilizer that contains slow-release, water-insoluble nitrogen and other essential nutrients is the most environmentally safe and cost-effective alternative. At least 30 percent of the nitrogen in the fertilizer should be listed as water insoluble. Fewer applications are necessary when using a product with water insoluble nitrogen. Fertilizer should contain little phosphorous, for most soils in Florida contain natural sources. When applying fertilizer use a maximum of one pound of nitrogen per 1,000 square feet no more than twice per year, for instance in March and September. Excellent results may be seen with much less fertilizer use, depending on plant and soil conditions. You can also reduce the risk of nitrate leaching into ground or surface waters by applying one-half pound of nitrogen per 1,000 square feet four times per year (March, May, September and early November).

6.3 Resources and References

Indoor Water Conservation and Savings Potential

Florida Water Management Districts
www.dep.state.fl.us/secretary/watman/index.htm

"Big Savings from Waterless Urinal."
Environmental Building News Vol. 7, No. 2, February 1998.

Outdoor Water Conservation and Florida Friendly Landscapes and Irrigation

"A Guide to Environmentally Friendly Landscaping: Florida Yards and Neighborhoods Handbook." Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida.
<http://hort.ufl.edu/fyn/hand.htm>

County Horticultural Extension Offices -
<http://hort.ufl.edu/fyn/count.htm>

