Revised Final Review Draft

Standards for Landscape Irrigation in Florida

Committee on Landscape Irrigation
and Florida-Friendly Design Standards (Section 373.228, F.S.)

October 2006

Northwest Florida Water Management District

Southwest Florida Water Management District

St. Johns River Water Management District

South Florida Water Management District

Suwannee River Water Management District

Florida Department of Environmental Protection

Florida Department of Agriculture and Consumer Services

Florida Department of Transportation

Florida Association of Counties

Florida League of Cities

Institute of Food and Agricultural Sciences at the University of Florida

Florida Nursery, Growers and Landscape Association

Florida Chapter of the American Society of Landscape Architects

Florida Irrigation Society

Florida Association of Community Developers

Overview

Up to one-half of public water supply in Florida is devoted to landscape irrigation. Given Florida's limited water resources, in combination with a rapidly growing population, wise irrigation practices will play an essential role in providing a sustainable water future for our state. Proper landscape design and irrigation system standards can help save significant amounts of water and money, and achieve both attractive landscapes and protection of our natural resources. Section 373.228, Florida Statutes (Attachment I) recognizes these issues, and directs the following parties to work together to improve landscape irrigation and design standards:

- The five water management districts (Northwest Florida, Suwannee, Southwest Florida, South Florida, and St. Johns River Water Management Districts).
- Florida Nursery, Growers and Landscape Association.
- Florida Chapter of the American Society of Landscape Architects.
- Florida Irrigation Society.
- Florida Department of Agriculture and Consumer Services.
- Institute of Food and Agricultural Sciences at the University of Florida.
- Florida Department of Environmental Protection.
- Florida Department of Transportation.
- Florida League of Cities.
- Florida Association of Counties.
- Florida Association of Community Developers.

The Committee on Landscape Irrigation and Florida-Friendly[1] Design Standards was formed to carry out the provisions of section 373.228(4), F.S. The Committee recognizes that it builds on the many major efforts previously made to improve landscape and irrigation design in Florida, including:

- Florida Green Industries Best Management Practices for Protection of Water Resources in Florida (June 2002, Florida Department of Environmental Protection)
- Florida Irrigation Society Standards (http://www.fisstate.org/standards.htm)
- Turf and Landscape Best Management Practices (The Irrigation Association, April 2002)

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[1] The Legislature directed the Committee's work to be on landscape irrigation and "xeriscape" design. The Committee recommends using the term "Florida-Friendly" over "xeriscape" design. The term "Florida-Friendly" is used in the Florida Water Resources Act as an equivalent to "xeriscape" (section 373.185, F.S.)

- Guide to Florida Friendly Landscaping (Florida Yards and Neighborhoods Handbook, 3rd Edition, 2006)
- Guidelines for Model Ordinance Language for Protection of Water Quality and Quantity Using Florida Friendly Lawns and Landscapes (Florida Department of Environmental Protection)
- Florida Irrigation Society Standards and Specifications for Turf and Landscape Irrigation Systems (5th Edition, December 1, 2005)

These recommendations comply with the Legislative requirement that:

- The landscape and irrigation design standards shall be based on the irrigation code defined in the Florida Building Code, Plumbing Volume, Appendix F.
- Local governments shall use these Standards when developing landscape irrigation and Florida-Friendly ordinances. (Section 373.228(4), F.S.)

The first section of this report comprises the "Standards" developed by consensus by the Landscape Irrigation Committee to be used by local governments when developing landscape irrigation and Florida-Friendly ordinances

The Committee also makes specific recommendations to agencies and other entities to aid in the implementation of the Standards. The last recommendation addresses the development of scientifically based Guidelines for urban, commercial, and residential landscape irrigation.

Definitions

Automatic System: An irrigation system which operates following a preset program entered into an automatic controller. (Source: Appendix F of the Plumbing Volume of the Florida Building Code.)

Controller: The timing mechanism and its mounting box. The controller signals the automatic valves to open and close on a pre-set program or based on sensor readings. (Source: Appendix F of the Plumbing Volume.)

Emitters: Devices which are used to control the discharge of irrigation water from lateral pipes. (Source: Modified from Appendix F of the Plumbing Volume.)

Florida Friendly: Describes practices, materials, or actions that help to preserve Florida's natural resources and protect the environment. (Source: FDEP, Guidelines for Model Ordinance Language for Protection of Water Quality and Quantity Using Florida Friendly Lawns and Landscapes.)

Head: A sprinkler head that provides above ground or overhead irrigation. Also known in the industry by such terms as rotor, spray head, mist head, and impact sprinkler. Sometimes used interchangeably with and in conjunction with "Sprinkler." (Source: Adapted from Appendix F of the Plumbing Volume.)

High Water Use Hydrozone: A distinct grouping of plants that require supplemental water on a regular basis throughout the year. (Source: Adapted from FDEP, Guidelines for Model Ordinance Language for Protection of Water Quality and Quantity Using Florida Friendly Lawns and Landscapes.)

Hydrozone: A distinct grouping of plants with similar water and irrigation needs and climatic requirements. (Source: Adapted from FDEP, Guidelines for Model Ordinance Language for Protection of Water Quality and Quantity Using Florida Friendly Lawns and Landscapes.)

Landscape Irrigation: Application of water to a landscape by artificial means, that is, means other than natural precipitation. (Source: Adapted from Appendix F of the Plumbing Volume.)

Microirrigation: The application of small quantities of water directly on or below the soil surface, usually as discrete drops, tiny streams, or miniature sprays through emitters placed along the water delivery pipes (laterals). Microirrigation encompasses a number of methods or concepts including drip, subsurface, microbubbler, and microspray irrigation, previously referred to as trickle irrigation, low volume, or low flow irrigation. (Source: Adapted from F.I.S. Standards and Specifications for Turf and Landscape Irrigation Systems and FDEP, Guidelines for Model Ordinance Language for Protection of Water Quality and Quantity Using Florida Friendly Lawns and Landscapes.)

Native Vegetation: Any plant species with a geographic distribution indigenous to all, or part, of the State of Florida as identified in: Wunderlin, R. P. 1998. Guide to the Vascular Plants of Florida. University Press of Florida, Gainesville. (Source: FDEP, Guidelines for Model Ordinance Language for Protection of Water Quality and Quantity Using Florida Friendly Lawns and Landscapes.)

Standards

These landscape and irrigation design Standards shall be used by local governments when developing landscape irrigation and xeriscape (Florida-Friendly) ordinances, pursuant to section 373.228, F.S.

I. Landscape and Xeriscape (Florida-Friendly) Design Standards

A. Low impact site design practices, such as preserving existing native trees and vegetation, shall be used if feasible. Where established natural vegetation is incorporated into the landscape design, irrigation of those areas shall not be required.

B. The plant palette and irrigation system shall be appropriate for site conditions, taking into account that, in some cases, soil improvement can enhance water use efficiency.

C. Plants shall be grouped together by irrigation demand.

D. The percentage of landscaped area in irrigated high water use hydrozones should be minimized. Local government ordinances shall address the percentage of irrigated landscaped area that may be included in high water use hydrozones. These high water use limits should not apply to landscaped areas requiring large amounts of turf for their primary functions, e.g., ballfields and playgrounds.

II. Irrigation System Design Standards

A. Irrigation systems shall be designed to meet the needs of the plants in the landscape (not the other way around).

B. When feasible, irrigation systems shall be designed to separately serve turf and non-turf areas.

C. The irrigation system plans and specifications shall identify the materials to be used and the construction methods.

D. The design shall consider soil, slope, and other site characteristics in order to minimize water waste, including overspray, the watering of impervious surfaces and other non-vegetated areas, and off-site runoff.

E. The system shall be designed to minimize free flow conditions in case of damage or other mechanical failure.

F. The system shall be designed to use the lowest quality water feasible.

G. Rain switches or other devices, such as soil moisture sensors, to prevent unnecessary irrigation, shall be incorporated. (Section 373.62, F.S.)

H. A recommended seasonal operating schedule and average precipitation rates for each irrigation zone for both establishment and maintenance conditions shall be provided.

I. Control systems shall provide the following minimum capabilities:

1) Ability to be programmed in minutes, by day of week, season and time of day,

2) Ability to accommodate multiple start times and programs,

3) Automatic shut off after adequate rainfall,

4) Ability to maintain time during power outages for a minimum of three days, and

5) Operational flexibility to meet applicable year-round water conservation requirements and temporary water shortage restrictions.

J. Recommended maintenance activities and schedules shall be included.

K. Precipitation rates for sprinklers and all other emitters in the same zone shall be matched, except that microirrigation emitters may be specified to meet the requirements of individual plants.

L. Irrigation systems shall be designed to maximize uniformity, considering factors such as:

1) Emitter types.

2) Head spacing.

3) Sprinkler pattern.

4) Water pressure at the emitter.

M. Irrigation systems with main lines larger than two inches or designed to supply more than seventy gallons per minute shall incorporate a means to measure irrigation water use, at a minimum of ninety-five percent accuracy across the flow range.

N. Irrigation system plans and specifications shall require the system installer to conduct final testing and adjustments to achieve design specifications prior to completion of the system and acceptance by the owner or owner's representative.

O. Irrigation system plans and specifications shall require that the installer provide property owners and users with post-construction documentation, including as-constructed drawings, recommended maintenance activities and schedules, operational schedule, design precipitation rates, instructions on adjusting the system to apply less water after the landscape is established, maintenance schedule, water source, water shut-off method, and the manufacturer's operational guide for their irrigation controller. To the extent feasible, similar information should be made available for subsequent property transfers.

Recommendation 1: For Local Governments

When developing landscape irrigation and Florida-Friendly landscape ordinances (section 373.228(4), F.S.), local governments shall use the Standards and should also consider the additional issues discussed below.

The Standards are intended to be used by local governments. Even when following the Standards, local governments retain substantial flexibility in implementation. A local government developing such ordinances should address important issues such as:

- Threshold of "new" construction. The Standards should apply to all new construction, as well as modifications that are significant enough that the most current standards should apply. Local governments must decide on the type of change for which these Standards would become applicable, such as:
    - Dollar amount of expenditure for construction or modification of irrigation system.
    - Installation or substantial modification (percentage change) of an automatic irrigation system.
    - Change in irrigated landscape.
    - Percent change in amount of water applied.
    - Percentage change in emitters.
- Nature of the local permitting program, including staffing levels, staff training, fee structure, review process, etc.
- Desirability of local requirements for certification or licensure of irrigation and landscaping contractors and installers.
- Compliance mechanisms, such as plan review, inspections, compliance reviews, or certification that the system was installed as designed, before issuance of a Certificate of Occupancy.
- Mechanisms to ensure that homeowners receive effective and user-friendly guidance on the operation of their automatic irrigation system.
- Coordinating the design and efficiency of individual homeowner irrigation systems with sources of supply that serve more than one home.
- Local education programs to promote efficient landscape irrigation. Local governments are also encouraged to promote the distribution of educational materials, such as those from the Florida Yards and Neighborhoods Program.

- Percentage of total landscaped area that may be included in high water use hydrozones. These high water use limits should not apply to landscaped areas requiring large amounts of turf for their primary functions, e.g., ballfields and playgrounds.

Carefully considering these issues and designing a program that meets local needs will help ensure the effectiveness of any landscape or Florida-Friendly ordinance.

Recommendation 2: For the Florida Department of Community Affairs

The Department of Community Affairs should consider the Standards in assisting in the local government comprehensive planning process.

Effective use by local governments of the Standards can affect future demand for water. In 2005, the Florida Legislature made significant changes to Chapters 163 and 373, F.S., to strengthen the link between land use and water supply planning. The legislative changes encourage cooperation in the development of alternative water supplies and reemphasize the need for conservation and reuse. The changes help to ensure that the local government's future land use plan (future land use element and future land use map) is based upon the availability of adequate water supplies, and the inclusion of selected alternative water supply projects in the local comprehensive plan.

Local governments must now consult with the applicable water supplier when issuing a building permit to ensure that an adequate water supply will be available to serve the development no later than the anticipated date of issuance by a local government of a certificate of occupancy. In addition, the 2005 Growth Management laws (Senate Bills 360 and 444) require that local governments adequately plan for future water needs by requiring close coordination between water management districts' regional water supply plans and the potable water element of local government comprehensive plans. Local plans must include a work plan for building public, private and regional water supply facilities to meet projected needs and must identify alternative water supply projects, including conservation and reuse, necessary to meet the water needs identified within the local government's jurisdiction.

In addition, the comprehensive plan Evaluation and Appraisal Report must address the extent to which the local government has implemented the work plan for building public, private and regional water supply facilities, including the development of alternative water supplies. The report must also include a determination as to whether the identified alternative water supply projects, traditional water supply projects, and the conservation and reuse programs have met local water use needs.

The Department of Community Affairs can use the Standards in at least three different ways:

1. **Promoting awareness of the Standards among Department staff and local government partners.** This would help implement the Standards on a voluntary basis as local governments understand better which actions can effectively promote water use efficiency and natural resource protection.
2. **Using the Standards in the Evaluation and Appraisal Report process**. The Department of Community Affairs, with input from the Department of Environmental Protection or the applicable water management district, a Regional Planning Council, or a local government, should identify the need for water conservation and water resource protection in the planning process. Once this issue has been identified in the EAR process, the Standards could serve as a technical assistance tool for local governments as they address the issue.

3. **Using the Standards in reviewing amendments to local government comprehensive plans.** When reviewing draft proposals to amend a plan, the Department of Community Affairs, with input from the Department of Environmental Protection or the applicable water management district, could use the Standards to help determine if the amendments address satisfactorily the need to promote water use efficiency and natural resource protection. For example, if a local government is proposing to adopt an ordinance to promote irrigation efficiency, or Florida-Friendly landscape design, the Standards can be used by the Department of Community Affairs as a starting point for items that should be considered during the ordinance development process. (See also Recommendation 1.for Local Governments on related decisions a local government must make when adopting such ordinances.)

Recommendation 3: For the Water Management Districts

The five Water Management Districts should consider these recommendations in reviewing water use permit applications for public water supply to determine if efficient use of water is being proposed (section 373.223, F.S.).

Under Florida water law, the water management districts can issue a water use permit only if the proposed withdrawal is a "reasonable-beneficial use" which means "in such quantity as is necessary for economic and efficient utilization for a purpose and in a manner which is both reasonable and consistent with the public interest" (sections 373.019(16) and 373.223(1), F.S.). The water management districts already review proposed withdrawals for public water supply in regard to promoting efficient irrigation.

In the future, the water management districts, in determining if a water use applicant proposes to use water efficiently, should consider if a public water supplier has adopted local ordinances that are consistent with the Standards. (This permitting function of the water management districts is in addition to their role in assisting DCA in the comprehensive plan reviews described in the previous recommendation.)

Recommendation 4: For the Conserve Florida Program

The water conservation Guide for public water supply required by section 373.227, F.S., should be revised appropriately to reflect the standards developed by the Committee.

The Conserve Florida water conservation program for public water supply has developed an on-line water conservation planning and reporting Guide for local utilities to use in developing water conservation programs. The Clearinghouse and Guide (housed at the University of Florida) already address the development of local landscape and irrigation ordinances and programs but should be updated to consider the Standards in this report. (section 373.227, F.S.)

Recommendation 5: For developing scientifically based model guidelines for urban, commercial, and residential landscape irrigation

The Committee members should continue to work to develop and improve the scientifically based guidelines.

Much progress in developing scientifically based guidelines has already been made, including work already underway on the irrigation needs of turf and shrubs. Florida Yards and Neighborhoods, the Green Industries BMPs, Model Ordinances prepared by water management districts, and other documents, are other examples of this effort.

More attention should be focused on developing and publishing usable summaries of the research in a format accessible to local governments. This will require multiparty collaboration, as well as some additional research. The water management districts, DEP and others should collaborate to identify areas of needed research, which should address both the "plant side" and the "pipe side" of irrigation. Some of the high priority future research topics identified include:

- Irrigation needs of landscape plants and turf.
- Improvement in technology for functional and inexpensive soil moisture sensors.
- Improvements in mobile irrigation labs.
- Development of telemetry and evapotranspiration-based control of irrigation.
- Breeding of water-efficient landscape plants and turf.

One possible forum for developing the research agenda is the new Conserve Florida Clearinghouse, which includes that function among its purposes.

Attachment I: Section 373.228, F.S. Landscape Irrigation Design.

(1) The Legislature finds that multiple areas throughout the state have been identified by water management districts as water resource caution areas, which indicates that in the near future water demand in those areas will exceed the current available water supply and that conservation is one of the mechanisms by which future water demand will be met.

(2) The Legislature finds that landscape irrigation comprises a significant portion of water use and that the current typical landscape irrigation system and xeriscape designs offer significant potential water conservation benefits.

(3) It is the intent of the Legislature to improve landscape irrigation water use efficiency by ensuring that landscape irrigation systems meet or exceed minimum design criteria.

(4) The water management districts shall work with the Florida Nurserymen and Growers Association, the Florida Chapter of the American Society of Landscape Architects, the Florida Irrigation Society, the Department of Agriculture and Consumer Services, the Institute of Food and Agricultural Sciences, the Department of Environmental Protection, the Department of Transportation, the Florida League of Cities, the Florida Association of Counties, and the Florida Association of Community Developers to develop landscape irrigation and xeriscape design standards for new construction which incorporate a landscape irrigation system and develop scientifically based model guidelines for urban, commercial, and residential landscape irrigation, including drip irrigation, for plants, trees, sod, and other landscaping. The landscape and irrigation design standards shall be based on the irrigation code defined in the Florida Building Code, Plumbing Volume, Appendix F. Local governments shall use the Standards when developing landscape irrigation and xeriscape ordinances. Every 5 years, the agencies and entities specified in this subsection shall review the Standards to determine whether new research findings require a change or modification of the Standards.

History.--s. 6, ch. 2004-381.