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CLERK OF THE BOARD
OF COUNTY COMMISSIONERS
MIAMI-DADE COUNTY, FLORIDA

Memorandum

MIAMI-DADE COUNTY

Date: December 16, 2008

To: Honorable Chairman Bruno A. Barreiro and Members, Board of County Commissioners

Agenda Item No. 8(R)(1)(A)

Resolution No. R-1426-08

From: George M. Burgess, County Manager

Subject: Resolution approving the County's Water-Use Efficiency Standards Manual per Section 32-84 of the Miami-Dade County Code

RECOMMENDATION

It is recommended that the Board of County Commissioners adopt the attached resolution approving the County's Water-Use Efficiency Standards Manual per Section 32-84 of the Miami-Dade County Code pursuant to Ordinance No. 08-14 and Ordinance No. 08-100. The preparation and publication of the Water-Use Efficiency Standards Manual, prepared by the Miami-Dade Water and Sewer Department (WASD), is part of an effort to improve the management of traditional water supplies while improving the efficiency of the County's current water use by introducing new water saving technology to the development community.

SCOPE

The item will have a countywide impact.

FISCAL IMPACT/FUNDING SOURCE

The development of the County's Water-Use Efficiency Standards Manual does not have a fiscal impact to Miami-Dade County. The associated public information and outreach activities carried out to comply with Section 32-84 of the Miami-Dade County Code were performed using existing resources.

TRACK RECORD/MONITOR

The new water saving technology requirements will be a part of the Miami-Dade County Code.

BACKGROUND

As directed by Ordinance 08-14, WASD's Water-Use Efficiency Section, in consultation with the Planning and Zoning Department and other county departments and agencies, prepared and published the County's Water-Use Efficiency Standards Manual to achieve maximum water savings in new residential and commercial developments in incorporated and unincorporated areas of Miami-Dade County. As required by Ordinance 08-100, the manual will be published and made available to the public on January 1, 2009, and will be updated yearly.

The manual provides applicants for water service with the County's new water saving technology standards which will be incorporated into new development, residential or commercial. As a result of these new requirements, a home built after January 2009 will consume 31 percent less water.

Assistant County Manager

MEMORANDUM

(Revised)

TO: Honorable Chairman Bruno A. Barreiro and Members, Board of County Commissioners

DATE: December 16, 2008

FROM: R. A. Cuevas, Jr. County Attorney

SUBJECT: Agenda Item No. 8(R)(1)(A)

Please note any items checked.

_____	**"4-Day Rule" ("3-Day Rule" for committees) applicable if raised**
_____	**6 weeks required between first reading and public hearing**
_____	**4 weeks notification to municipal officials required prior to public hearing**
_____	**Decreases revenues or increases expenditures without balancing budget**
_____	**Budget required**
_____	**Statement of fiscal impact required**
_____	**Bid waiver requiring County Manager's written recommendation**
_____	**Ordinance creating a new board requires detailed County Manager's report for public hearing**
_____	**Housekeeping item (no policy decision required)**
_____	**No committee review**

Approved _____ Mayor
Veto _____
Override _____

Agenda Item No. 8(R)(1)(A)
12-16-08

RESOLUTION NO. **R-1426-08**

RESOLUTION APPROVING MIAMI-DADE COUNTY'S WATER USE EFFICIENCY STANDARDS MANUAL

WHEREAS, this Board desires to accomplish the purposes outlined in the accompanying memorandum, a copy of which is incorporated herein by reference,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that this Board hereby approves Miami-Dade County's Water-Use Efficiency Standards Manual in accordance with Ordinance No. 08-14, in substantially the form attached hereto and made a part hereof; and authorizes the Mayor or Mayor's designee to execute same for and on behalf of Miami-Dade County, Florida.

The foregoing resolution was offered by Commissioner **Katy Sorenson**, who moved its adoption. The motion was seconded by Commissioner **Carlos A. Gimenez** and upon being put to a vote, the vote was as follows:

Bruno A. Barreiro, Chairman **aye**
Barbara J. Jordan, Vice-Chairwoman **aye**

Jose "Pepe" Diaz	**aye**	Audrey M. Edmonson	**aye**
Carlos A. Gimenez	**aye**	Sally A. Heyman	**aye**
Joe A. Martinez	**aye**	Dennis C. Moss	**aye**
Dorrin D. Rolle	**aye**	Natacha Seijas	**absent**
Katy Sorenson	**aye**	Rebeca Sosa	**aye**
Sen. Javier D. Souto	**aye**		

The Chairperson thereupon declared the resolution duly passed and adopted this 16th day of December, 2008. This resolution shall become effective ten (10) days after the date of its adoption unless vetoed by the Mayor, and if vetoed, shall become effective only upon an override by this Board.

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

HARVEY RUVIN, CLERK

By: **Kay Sullivan**
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency:

Henry N. Gillman

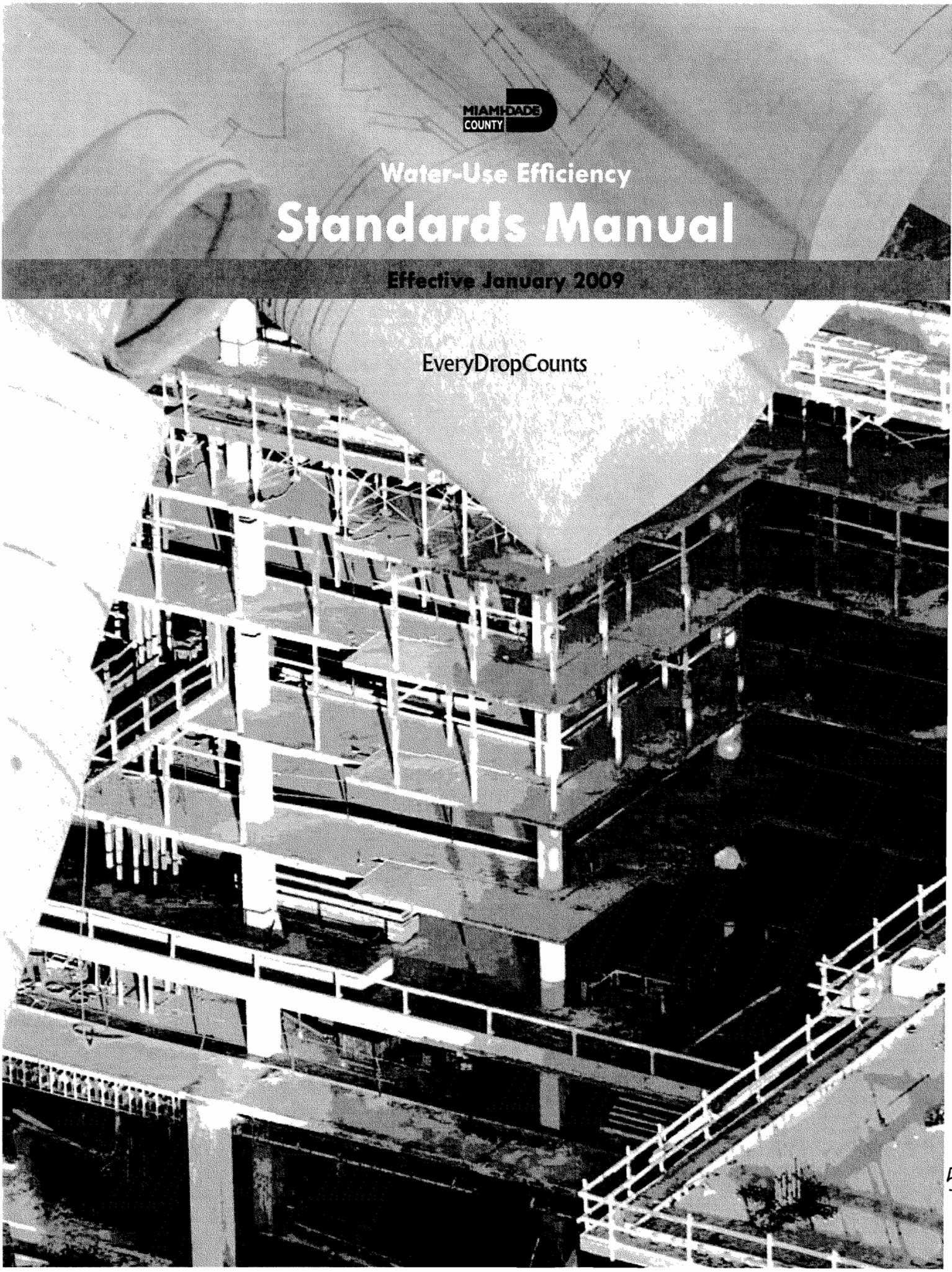
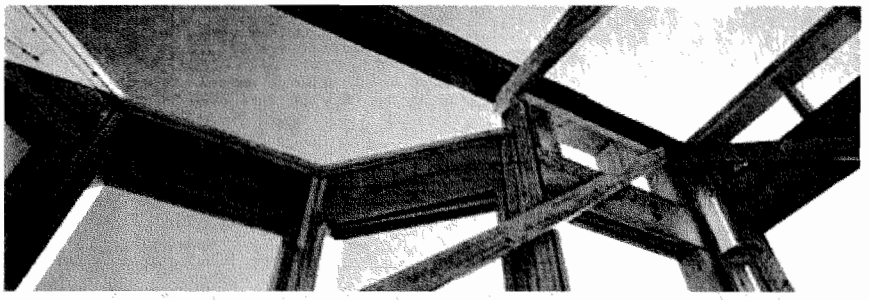

MIAMI-DADE
COUNTY
Water-Use Efficiency
Standards Manual
Effective January 2009
EveryDropCounts

TABLE OF CONTENTS

1.	Introduction		2
2.	Residential Indoor Water-Use Requirements		3
	2.1	Plumbing Fixtures	3
	2.2	Equipment Standards	4
3.	Sub-metering		4
4.	Industrial, Commercial and Institutional (ICI) Indoor Water-Use Requirements		5
	4.1	Plumbing Fixtures	5
5.	Alternative Water Supply (AWS) Requirements for Large Developments		5
6.	Recommendations for Industrial, Commercial and Institutional Water-Use Efficiency Requirements		7
	6.1	Plumbing Design	7
	6.2	Cooling Towers	7
	6.3	Swimming Pools	7
	6.4	Commercial Kitchens	7
	6.5	Medical Facilities and Laboratories	8
	6.6	Vehicle Washing	8
	6.7	Laundry Operations	8
7.	Recommendations for Outdoor Water-Use for Residential, Non-Residential and Rights of way		9
	7.1	Landscape Plan and Plant Selection	9
	7.2	Irrigation	10
	7.3	Surface Elements and Features	10
8.	Appendices		11
	8.1	Water Savings Calculation Table	12
	8.2	Standards Checklist	13



1. INTRODUCTION

The Miami-Dade County Board of County Commissioners amended Chapters 8 and 32 of the Code of Miami-Dade County establishing new standards for water saving fixtures for new construction. This measure is part of the County's commitment to protect our natural resources while providing water for the future through efficient use. Conservation efforts outlined in the County's 20-Year Water- Use Permit will provide over 19 million gallons of water a day for future use, this being the most economically feasible source available. Through the use of new technology it is estimated that a new home can use up to 31% less water than homes using current technology. It is the County's intent to encourage and require the use of the most efficient water saving technology available.

The new requirements include the development and publication of a Water-Use Efficiency Standards Manual (manual) under Section 32-84 of the Code of Miami-Dade County. The Manual was developed by the Miami-Dade County Water and Sewer Department's Water-Use Efficiency Section in consultation and collaboration with the Miami-Dade Planning Department, other county departments, state agencies and an Advisory Committee of stakeholders. The general public was invited to participate in the process through public comment either in person or through the Water-Use Efficiency Website. The manual provides specific code changes per Ordinances 08-14 and 08-100 regarding high efficiency flow rate requirements for bathroom and kitchen fixtures. The manual also provides additional guidance and recommendations for new development in Miami-Dade County with the intent of achieving the maximum water savings in new residential and commercial developments in both unincorporated and incorporated areas of Miami-Dade County. It is recommended that developers and builders make every effort to use the most efficient water saving technology available for the specific building type of new construction. The Water-Use Efficiency requirements included in this manual adopt the Environmental Protection Agency's (EPA) WaterSense recommendations as a baseline and call for stricter requirements in some instances. In the event where the EPA's WaterSense Program adopts water efficiency standards that are less efficient than those adopted by Miami-Dade County, such products will be accepted as per Ordinances 08-14 and 08-100 of the Code of Miami-Dade County.

The effective date for the implementation of the requirements included in this manual is January 1, 2009 and will be updated annually to include the most efficient water saving technology available.

Who needs to use the manual?

Each applicant for water service to a new residential (R), industrial, commercial or institutional (ICI) development in incorporated and unincorporated areas of Miami-Dade County shall include in its application water-use efficiency standards detailed in Section 8-31 of the Code of Miami-Dade County. These requirements apply to all new construction regardless of the water source (i.e. well). These requirements also apply to remodeling permits of an amount greater than 50% or more of a structure's market value (the 50% Rule).

Review and evaluation of new applications

The County or applicable municipality shall review the application for compliance with Section 8-31 of the Code of Miami-Dade County. In evaluating the application for compliance, the County or applicable municipality will consider the availability of products to implement the required water-use efficiency standards at the time of construction. The developer's agreement for water service should include the water-use efficiency standards approved by the County. Additional water-use efficiency options are provided for consideration as a supplement.

Residential Indoor Water-Use Requirements

Residential new flow rates for fixtures and new requirements for appliances are detailed as adopted in the Code of Miami-Dade County.

Industrial, Commercial and Institutional Indoor Water-Use Requirements

Industrial, Commercial and Institutional flow rates for fixtures and new requirements for appliances are detailed as adopted in the Code of Miami-Dade County.

Sub-metering Requirement for Multi-Unit Complexes

Multi-unit complexes are required to install separate sub-meters throughout the property.

Alternative Water Supply Requirements

Applications for new Development of Regional Impact ("DRI") with a projected water demand of one million gallons per day or greater have additional requirements to meet their projected water demand. Alternative water supply sources may be required to be developed by this type of development.

Additional Recommendations Industry Specific Indoor Recommendations

A selection of industry specific water-use efficiency requirements is provided as an appendix to the manual. The following are not the only industries that are being addressed by the manual but rather an example of technology currently available for those industries included in the section.

Outdoor Water-Use Recommendations

The Miami-Dade Planning Department addresses new requirements for landscape and irrigation for residential, non-residential and right-of-way outdoor areas.

Homeowner Education

Operating Manual – The builder should develop and provide to the homebuyer a written operating and maintenance manual for all water-using equipment or controls installed in the house and or yard. If clothes washers or dishwashers are not provided, information about water-efficient appliances shall be included in the packet. Information materials can be obtained from the Water and Sewer Department's Water-Use Efficiency Section.

2. RESIDENTIAL INDOOR WATER-USE

All new residential developments shall comply with the following as per Miami-Dade County Code Section 8-31:

2. 1 Plumbing Fixtures

2.1.1 Toilets installed shall be high efficiency toilet (HET) models rated and tested at a maximum average flush volume of 1.28 gallons per flush (gpf) and be certified by the United States Environmental Protection Agency (EPA) WaterSense Program. No flush or conversion devices of any kind shall be accepted.

2.1.1.1 Single Flush Toilets

Single Flush Toilets – The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A112.19.2.

2.1.1.2 Dual Flush Toilets

The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush when tested in accordance with ASME A112.19.2 and ASME A112.19.14.

2.1.2 Showerheads installed shall have a maximum flow rate of 1.5 gallons per minute (gpm) or display the EPA WaterSense label when available. A showerhead is defined as including the following types of emitters: a traditional showerhead, rain system, waterfall, bodyspray, bodyspa, or jet.

2.1.3 Maximum flow rate of lavatory faucets or the lavatory accessory must conform to applicable requirements in ASME A112.18.1/CSA B125.1 and NSF/ANSI Standard 61, Section 9.

2.1.3.1 The maximum flow rate shall not exceed 1.5 gpm (5.7 liters) at a pressure of 60 psi at the inlet, when the water is flowing.

2.1.4 The maximum flow rate for kitchen faucets must conform to applicable requirements.

2.1.4.1 The maximum flow rate shall not exceed 1.5 gpm (5.7 liters) at a pressure of 60 psi at the inlet, when the water is flowing.

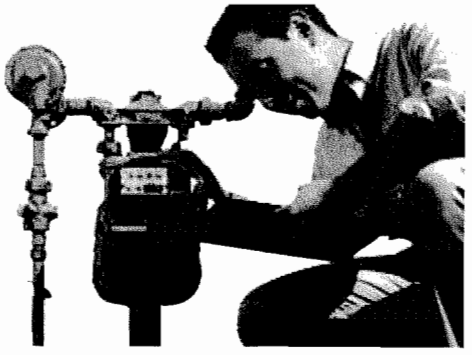
Installation of flow restrictors in existing kitchen faucets satisfies this requirement.

2. 2 Equipment Standards

2.2.1 Clothes washing machines installed shall be front horizontal or top loading models with (1) a water factor (WF) rating of 8 gallons per cycle per cubic foot capacity or lower as identified under Energy Star label or (2) display an EPA WaterSense label when available. WF is the number of gallons used per cycle per cubic foot of the clothes washer capacity. The lower the WF, the more water-efficient the clothes washer.

2.2.2 Dishwashers installed shall use 6.0 gallons or less of water per cycle and be Energy Star labeled or EPA WaterSense labeled when available.

3. SUB-METERING



Water deliveries to multi-unit complexes are often recorded by one master meter, while individual dwelling units are not metered. Submetering is the use of separate meters in the individual supply lines to apartments, condominiums, stores, or offices where the main facility or building is still billed by the water utility from a master meter.

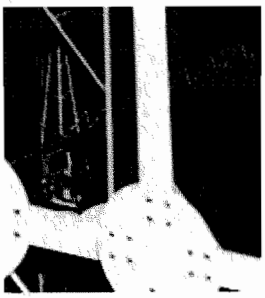
Multi-unit complexes will be required to install separate sub-meters throughout the property. The installation of sub-meters shall be consistent with all major water-using functions and monthly records shall be available upon request. Cooling towers and other common areas of multi-unit complexes housing shall comply with Section 6.0 of this guide.

4. INDUSTRIAL, COMMERCIAL AND INSTITUTIONAL INDOOR WATER-USE

All new non-residential development (including Residential Common Areas) shall comply with the following:

4.1 Plumbing Fixtures

4.1.1 Toilets installed shall be high efficiency toilet (HET) models rated and tested at a maximum average flush volume of 1.28 gallons per flush (gpf) and be certified by United States EPA's WaterSense Program. Pressure-assisted or flushometer type toilets shall be high-efficiency rated at a maximum 1.5 gpf. No flush or conversion devices of any kind shall be accepted.



4.1.1.1 Single Flush Toilets

Single Flush Toilets – The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A112.19.2.

4.1.1.2 Dual Flush Toilets

The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush when tested in accordance with ASME A112.19.2 and ASME A112.19.14.

4.1.2 Urinals installed shall be zero water consumption (waterless urinal) or have a maximum rated flow of 0.5 gpf or less.

4.1.3 Lavatory Faucets

4.1.3.1 The maximum flow rate of the lavatory faucet shall not exceed 0.5 gpm at 60 psi at the inlet, when water is flowing.

4.1.3.2 Mechanical meter and or electronic sensor controls will be installed on hand washing faucets in public restrooms.

4.1.4 Showerheads installed shall have a maximum flow rate of 1.5 gpm or display a EPA's WaterSense label when available. Installation of flow restrictors in existing showerheads does not satisfy this requirement.

4.1.5 All emergency showers and eye wash stations are exempt from the flow restrictions.

5. ALTERNATIVE WATER SUPPLY REQUIREMENTS FOR LARGE DEVELOPMENTS

Applicants for new Development of Regional Impact ("DRI") with a projected water demand of one million gallons per day or greater shall be evaluated by MDWASD to determine the feasibility of an alternative water supply project. Such projects may include the installation of a reverse osmosis plant, waste water reclamation facility and reuse distribution systems.

6. RECOMMENDATIONS

6. RECOMMENDATIONS FOR INDUSTRIAL, COMMERCIAL AND INSTITUTIONAL WATER-USE EFFICIENCY

6.1 Plumbing Design

6.1.1 Use of tankless water heater or other devices that reduce water waste while waiting for the water to get hot where applicable.

6.1.2 Post prominent signs in all restroom, shower facilities, laundries, kitchens and other water using areas listing telephone numbers or contact persons to promptly report leaks and other plumbing problems.

6.2.3 Choose equipment that is water and energy efficient.

6.3.4 Install automatic shutoffs, solenoids and controllers to turn water off when not in use.

6.4.5 Install flow restrictors when applicable.

6.5.6 Where point of use hot water system is used - The performance standard for point of use hot water system is defined as: Using 0.5 gallons of water or less discharged at any fixture before hot water arrives.

6.2 Cooling Towers

6.2.1 Equip boilers with makeup meters and conductivity controllers for blowdown control.

6.2.2 Reuse or return steam condensate to the boiler wherever possible.

6.2.3 Install makeup meters on all recirculating closed water loops used for heating and cooling systems so that leaks in these recirculating systems can be easily detected.

6.2.4 No evaporative air conditioning system is encouraged. When evaporative air conditioners are installed, it shall use 5 gallons (or less) of water per ton-hour of cooling when adjusted to maximum water-use. Blow-down shall be based on time of operation, not to exceed three times in one 24-hour operating period. The reservoir discharge outlet should be easily visible so the homeowner can see when the refill valve is leaking.

6.3 Swimming Pools

6.3.1 Combined pool and spa surface deducted from turf allowance.

6.3.2 Pools do not feature decorative water features that drop or propel water more than 24 inches above the main water surface.

6.4 Commercial Kitchens

These criteria are for the following land use types:
Full service restaurant, bar and cocktail lounges, fast-food restaurants, take-out restaurant, food preparation outlets (bakeries, meat markets, commissaries) and other residential institutions or facilities with a cafeteria.

6.4.1 Kitchen faucets shall have aerators or laminar flow control devices with a maximum flow rate of 1.5 gpm or less.

6.4.2 Food steamers in all food service facilities shall be boiler less or self contained models where applicable.

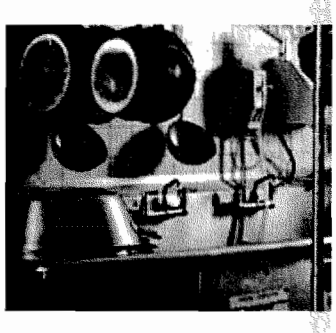
6.4.3 Ice machines shall be air-cooled or use no more than 20 gallons of water per 100 pounds of ice and shall be equipped with a recirculating cooling unit. Flake ice machines are more water-efficient and should be used where possible.

6.4.4 Use waterless (air cooled) wok system where possible. If a water cooled wok system or water curtain system is absolutely necessary, the flow should be limited to less than 0.5 gallon per minute.

6.4.5 Commercial refrigeration shall be air cooled or if water cooled, must have a closed loop system. No once through, single pass systems should be permitted.

6.4.6 Any and all water-cooled equipment should be eliminated unless it uses chilled water or cooling tower loop.

6.4.7 Dishwashing Equipment



6.4.7.1 Dishwashers should use less than 1.2 gallons per rack for fill and dump machines and less than 0.9 gallons per rack for all other types of machines.

6.4.7.2 Under the counter machines should not exceed 1.0 gallons per rack for high-temperature machines and 1.7 gallons per rack for low temperature machines.

6.4.7.3 Pre-rinse dishwashing spray valves shall have a maximum flow rate of 1.6 gpm or less and contain a shut off valve.

6.5 Medical Facilities and Laboratories

These criteria are for the following land use types:
Dentist's offices, Physician's office, Veterinarian's offices and hospitals.

6.5.1 X-Ray Equipment

6.5.1.1 Use of digital x-ray shall be considered where available and applicable.

6.5.1.2 For large frame x-ray equipment, water saving devices shall be integrated to eliminate continuous flowing cooling water loops of the film developers.

6.5.2 Vacuum Pumps

6.5.2.1 For medical and dental vacuum pump systems, choose dry vacuum systems to eliminate water-use.

6.5.2.2 Eliminate venturi aspirator vacuum systems by using mechanical dry vacuum equipment.

6.5.3 Hood Systems

6.5.3.1 For laboratory exhaust hoods, use dry system wherever possible.

6.5.3.2 Where exhaust hood scrubber systems are used, adjust the flow rates to minimize water-use.

6.5.3.3 Include self-closing valves on fume hood wash down systems for special applications such as perchloric acid hoods to limit water-use.

6.6 Vehicle Washing

These criteria are for the following land use types:
ALL car washes

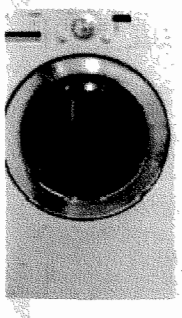
6.6.1 Vehicle wash facilities shall reuse a minimum of 70% of water from previous vehicle rinses in subsequent washes.

6.6.2 Choose new rollover and conveyor equipment that uses less than 35 gallons per vehicle for automobiles and light trucks and less than 75 gallons per vehicle for bus and large truck washes.

6.6.3 Select handheld spray equipment. Foamy brush and similar systems that use no more than 3.0 gpm for automobiles washing and no more than 3.5 gpm for bus and large truck washes.

6.6.4 Include positive shutoff valves on handheld spray wands, foamy brush and similar systems so water will not run when equipment is not in use.

6.7 Laundry Operations



These criteria are for the following land use types:
Coin Laundries, textile with laundry operations, multiunit residential with a common laundry area, hospitals with a laundry facility, any other residential institution or facility with a common laundry service area.

6.7.1 Large volume commercial operations should consider using tunnel washers.

6.7.2 The use of water recovery or ozone systems shall be used to minimize water-use.

6.7.3 The installation of high recovery water recycling equipment.

6.7.4 Commercial laundry washing machines shall be front loading horizontal axis or top loading models with (1) a water factor rating of 8 or lower as identified under Energy Star label or (2) display an EPA WaterSense label when available.

7. RECOMMENDATIONS FOR OUTDOOR WATER-USE RESIDENTIAL, NON-RESIDENTAL AND RIGHTS OF WAY

All landscape installation shall be in compliance with the Miami-Dade County Landscape Manual and/or with the Guide to Florida-Friendly Landscaping provided by the Florida Yards and Neighborhoods.

7.1 Landscape Plan and Plant selection

7.1.1 Site characteristics (soil, drainage, structural) and limitations (utilities, overhangs, light) shall be incorporated in the development of the landscape plan and plant palette.

7.1.2 Per County's Landscape Ordinance (Chapter 18A of the County Code), existing native trees, palms and associated native understory, shall be retained and preserved.

7.1.3 Eighty (80) percent of plant material to be utilized on site shall be from the Miami-Dade Landscape Manual, the Miami-Dade Street Tree Master Plan and/or the University of Florida's Low-Maintenance Landscape Plants for South Florida list.

7.1.4 In order to conserve water, reduce maintenance, and promote plant health, plant species shall be selected and installed based on their water needs, growth rate and size, and resource inputs. Plants with similar water needs shall be grouped in hydrozones. Adequate growth area (including rooting space), based on natural mature shape and size shall be provided for all plant materials.

7.1.5 The plan shall include the use of native plant species in order to re-establish an aesthetic regional quality and take advantage of the unique diversity and adaptability of native species to the environmental conditions of South Florida. Where feasible, the re-establishment of native habitats shall be incorporated into the landscape plan.

7.1.6 The maximum lawn area shall be in compliance with the County's Landscape Ordinance (Section 18A-6 of the County Code).

7.1.7 Soil analysis should be completed and used in plant selection process where applicable and a copy should be provided to the homebuyer.

7.1.8 Environmentally friendly organic mulches shall be applied and maintained in a minimum three (3) inch layer under and around all trees and shrubs, and in a minimum two (2) inch layer under and around all ground cover.

7.1.9 As provided in the Landscape Manual, lots with landscapes adjoining water bodies shall provide for a maintenance free or low maintenance zone adjacent to the water body. This area can be enhanced with natural wetland vegetation; in any case, the area should be planted to eliminate erosion potential.

14

7.2 Irrigation

7.2.1 All newly-planted and relocated plant material shall be watered by temporary or permanent irrigation systems until such time as they are established and subsequently on an as needed basis, to prevent stress and die off in compliance with existing water restrictions.

7.2.2 Irrigation shall be prohibited within native plant communities and natural forest communities, except for temporary systems needed to establish newly planted material. Temporary irrigation systems shall be disconnected immediately after establishment of plant communities.

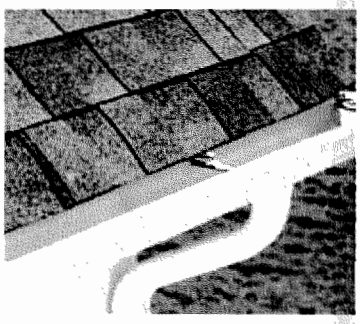
7.2.3 Irrigation systems shall be designed, operated and maintained to:

- 7.2.3.1 Meet the needs of the plants in the landscape.
- 7.2.3.2 Conserve water by allowing differential operation schedules based on hydrozone.
- 7.2.3.3 Consider soil, slope and other site characteristics in order to minimize water waste, including overspray or overflow on to impervious surfaces and other non-vegetated areas, and off-site runoff.
- 7.2.3.4 Minimize free flow conditions in case of damage or other mechanical failure.
- 7.2.3.5 Use low trajectory spray heads, and/or low volume water distributing or application devices.
- 7.2.3.6 Maximize uniformity, considering factors such as:
  - 7.2.4.6.1 Emitters types,
  - 7.2.4.6.2 Head Spacing,
  - 7.2.4.6.3 Sprinkler pattern, and
  - 7.2.4.6.4 Water pressure at the emitter.
- 7.2.3.7 Use the lowest quality water feasible (gray water shall be used where approved systems are available).
- 7.2.3.8 Rain switches or other devices, such as soil moisture sensors, shall be used with automatic controls.
- 7.2.3.9 Operate only during hours and on days permitted under Chapter 32 of the Code.
- 7.2.3.10 Where feasible, drip irrigation or micro-sprinklers shall be used.

7.2.4 During dry periods, irrigation application rates of between one (1) and one and one-half (1 ½) inches per week are recommended for turf areas.

7.2.5 If an irrigation system is not provided, a hose bib shall be provided within seventy-five (75) feet of any landscape area.

7.3 Surface Elements and Features



7.3.1 Gutter downspouts, roof runoff, and rain harvesting shall be used to encourage increased recharge and other non-portable uses on the property, thru the use of elements and features such as rain barrels and direct runoff to landscaped areas.

7.3.2 Use of porous surfaces (brick, gravel, turf block, mulch, and pervious concrete) shall be used whenever applicable on walkways, driveways and patios.

7.3.3 Miami-Dade Landscape Manual and Florida Yards and Neighborhoods' Program Information on Florida Friendly Landscapes shall be included in the sales literature provided to homebuyers.

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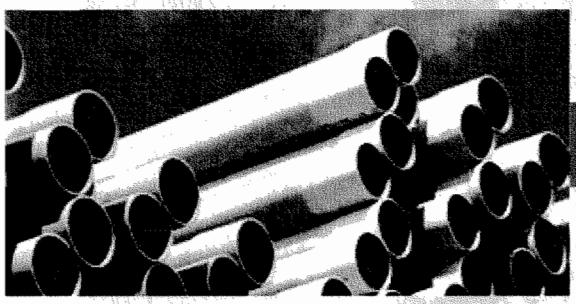

APPENDICES

8.1 - APPENDIX 1 - WATER SAVINGS CALCULATION TABLE

This Table Reflects Water-Use For A New Home Including Savings From High Efficiency Showerhead and Kitchen Faucet. Total Savings of 31%.

Indoor Features	Standard Water-Use Including Kitchen Faucet	Water Sense Standard Use Including Miami-Dade Flow for Kitchen Faucet (gal/day/capita)	Water Sense Flows Plus Miami-Dade Criteria For Kitchen Faucet and Showerheads	Miami-Dade Expected Use Including Showerhead and Kitchen Faucet (gal/day/capita)	Miami-Dade Expected Water Savings Including Showerhead and Kitchen Faucet (gal/day/capita)
Toilets	1.6 gpf	8.16[24]	1.28 gpf	6.53	1.63 (20%)
Bathroom faucets	2.2 gpm	11.21[25]	1.5 gpm[26]	10.64	0.57 (5%)
Kitchen faucets	2.5 gpm	7.36 *	1.5 gpm (Miami-Dade)[37]	4.2[38]	2.8 (40%)
Showerheads	2.5 gpm	10.33[27]	1.5 gpm (Miami-Dade)[37]	7.27[38]	4.85 (40%)
Hot water delivery systems	~10 gallons per day per household wasted	3.85[29]	Assume 10% water savings for insulation and between 15-20% water savings for improved design.[30]	2.89	0.96 (25%)
Dishwashers	8.6 gallons per load (6 gallons per cycle)	1.04	5.8 gallons per load (4 gallons per cycle)[33]	0.69	0.35 (33%)
Clothes washers	39.6 gallons per load (12 gallons per cycle per cubic foot)	15.35	24 gallons per load (6 gallons per cycle per cubic foot)[35]	8.44	6.91 (45%)
Total Indoor		57.30		40.66	18.07 (31% savings)

[24]Assumes 5.1 flushes/day/person per Mayer. P, DeOreo, W. et al 2000 and 2003.
[25]Assumes flow of 1.2 gpm and average use of 9.34 minutes/person/day per Mayer, P., DeOreo, W. et al 2000 and 2003.
[26]Assumes flow of .97 gpm and average use of 10.97 minutes/person/day per Mayer, P. , DeOreo W. et al 2000 and 2003.
[27]Assumes flow of 2.13 gpm, average use of 8.36 min/shower/person, and .58 showers/person/day per Mayer P., DeOreo W. et al 2000 and 2003.
[28]Klein, Gary. Hot Water Distribution Considerations for BMPs. Presentation made on August 21, 2006 to the Californa Urban Water Conservation Council.
[29]Assumes 2.6 persons per household per U.S. Department of Housing and Urban Oevelopment 2005.
[30]Acker, L., Klein, G. *Benefits of Demand-Controlled Pumping.* Home Energy. September/October 2006.
[31]Assumes 8.64 gallons/load and .12 loads/person per Mayer, P., DeOreo, W. et al 2000, 2003, and 2004.
[32]ENERGY STAR Frequently Asked Questions on Dishwashers. <energystar.custhelp.com/cgi-bin/energystar.cfg/php/enduser/std_adp.php?p_faqid=2539&o_created...>accessed 2/15/08.
[33]Ibid.
[34]Assumes 39.36 gallons/load and .39 loads/person per Mayer, P., DeOreo, W. et al 2000, 2003, and 2004.

WaterSense savings for a new home is 21%, - Miami-Dade savings for a new home are calculated at 31%, this is possible by including showerheads and kitchen faucets at the water saving rate of 1.5 gallon per minute respectively. WaterSense has not yet certified showerheads or kitchen faucets.

[35]Assumes 24.15 gallons/load and .35 loads/person per Mayer, P., DeOreo, W. et al 2000, 2003, and 2004.
[36]Mayer, Peter, private communication, 2005. Derived by the subtraction of lavatory faucets (3.4 gpcd) and seldom-used utility sink faucets.
[37]Flow based on Miami-Dade County Criteria.
[38]Assumes flow of 1.58 PM based on Miami-Dade County criteria and average use of 2.8 min/person/day based on standard use per capita of 7 gal/person/day and a standard flow of 2.58 PM
[39]Assumes flow of 1.58 PM based on Miami-dade County criteria and an average use per person of 4.85 min/person/day based on data in footnote 27.
* Miami-Dade utilized the Methodology used by WaterSense to calculate the saving values for Showerheads and Kitchen Faucets. 9/2/08 Code of Miami-Dade County.

17

8.2 - APPENDIX 2 - STANDARD CHECKLIST

Miami-Dade Water-use Efficiency Standards – Required	
Section 8-31 of the Code	
2.0	RESIDENTIAL INDOOR WATER-USE
	All new residential developments shall comply with the following as per Miami-Dade County Code Section 8-31:
2. 1	Plumbing Fixtures
2.1.1	Toilets installed shall be high efficiency toilet (HET) models rated and tested at a maximum average flush volume of 1.28 gallons per flush (gpf) and be certified by the United States Environmental Protection Agency (EPA) WaterSense Program. No flush or conversion devices of any kind shall be accepted.
2.1.1.1	Single Flush Toilets
	Single Flush Toilets – The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A112.19.2.
2.1.1.2	Dual Flush Toilets
	The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush when tested in accordance with ASME A112.19.2 and ASME A112.19.14.
2.1.2	Showerheads installed shall have a maximum flow rate of 1.5 gallons per minute (gpm) or display the EPA WaterSense label when available. A showerhead is defined as including the following types of emitters: a traditional showerhead, rain system, waterfall, bodyspray, bodyspa, or jet.
2.1.3	Maximum flow rate of lavatory faucets or the lavatory accessory must conform to applicable requirements in ASME A112.18.1/CSA B125.1 and NSF/ANSI Standard 61, Section 9.
2.1.3.1	The maximum flow rate shall not exceed 1.5 gpm (5.7 liters) at a pressure of 60 psi at the inlet, when the water is flowing.
2.1.4	The maximum flow rate for kitchen faucets must conform to applicable requirements.
2.1.4.1	The maximum flow rate shall not exceed 1.5 gpm (5.7 litters) at a pressure of 60 psi at the inlet, when the water is flowing.
	Installation of flow restrictors in existing kitchen faucets satisfies this requirement.
2.2	Equipment Standards
2.2.1	Clothes washing machines installed shall be front horizontal or top loading models with (1) a water factor (WF) rating of 8.0 gallons per cycle per cubic foot capacity or lower as identified under Energy Star label or (2) display an EPA WaterSense label when available. WF is the number of gallons used per cycle per cubic foot of clothes washer capacity. The lower the WF, the more water-efficiency the clothes washer.
2.2.2	Dishwashers installed shall use 6.0 gallons or less of water per cycle and be Energy Star labeled or EPA WaterSense labeled when available.
3.0	SUB-METERING
	Water deliveries to multi-unit complexes are often recorded by one master meter, while individual dwelling units are not metered. Sub-metering is the use of separate meters in the individual supply lines to apartments, condominiums, stores, or offices where the main facility or building is still billed by the water utility from a master meter. Multi-unit complexes will be required to install separate sub-meters throughout the property. The installation of sub-meters shall be consistent with all major water-using functions and monthly records shall be available upon request. Cooling towers and other common areas of multi-unit complexes shall comply with Section 6.0 of this guide.

18

APPENDIX 2 - STANDARD CHECKLIST

Miami-Dade Water-use Efficiency Standards – Required	
Section 8-31 of the Code	
4.0	INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL INDOOR WATER-USE
	All new non-residential development (including Residential Common Area) shall comply with the following:
4.1	Plumbing Fixtures
4.1.1	Toilets installed shall be high efficiency toilet (HET) models rated and tested at a maximum average flush volume of 1.28 gallons per flush (gpf) and be certified by United States Environmental Protection Agency (EPA) WaterSense Program. Pressure-assisted or flushometer type toilets shall be high-efficiency rated at a maximum 1.5 gpf. No flush or conversion devices of any kind shall be accepted.
4.1.1.1	Single Flush Toilets
	Single Flush Toilets – The effective flush volume should not exceed 1.28 gallons (4.8 liters). The effective flush volume is the average flush volume when tested in accordance with ASME A112.19.2.
4.1.1.2	Dual Flush Toilets
	The effective flush volume shall not exceed 1.28 gallons (4.8 liters). The effective flush volume is defined as the composite, average flush volume of two reduced flushes and one full flush when tested in accordance with ASME A112.19.2 and ASME A112.19.14.
4.1.2	Urinals installed shall be zero water consumption (waterless urinal) or have a maximum rated flow of 0.5 gpf or less.
4.1.3	Lavatory Faucets
4.1.3.1	The maximum flow rate of the lavatory faucet shall not exceed 0.5 gpm at 60 psi at the inlet, when water is flowing.
4.1.3.2	Mechanical meter and or electronic sensor controls will be installed on hand washing faucets in public restrooms.
4.1.4	Showerheads installed shall have a maximum flow rate of 1.5 gallons per minute (gpm) or display a EPA WaterSense label when available. Installation of flow restrictors in existing showerheads does not satisfy this requirement.
4.1.5	All emergency showers and eye wash stations are exempt from the flow restrictions.
5.0	ALTERNATIVE WATER SUPPLY REQUIREMENT FOR LARGE DEVELOPMENTS
	Applicants for new Development or Regional Impact ("DRI) with a projected water demand of one million gallons per day or greater shall be evaluated by MDWASD to determine the feasibility of an alternate water supply project. Such projects may include the installation of a reverse osmosis plant, waste water reclamation facility and reuse distribution system.

19

APPENDIX 3 - CHECKLIST

	Additional Recommendations	Recommended
6.0	INDUSTRIAL, COMMERCIAL AND INSTITUTIONAL WATER-USE EFFICIENCY	
6.1	Plumbing Design	
6.1.1	Use of tankless water heater or other devices that reduce water waste while waiting for the water to get hot where applicable.	
6.1.2	Post prominent signs in all restroom, shower facilities, laundries, kitchens and other water using areas listing telephone numbers or contact persons to promptly report leaks and other plumbing problems.	
6.1.3	Choose equipment that is water and energy efficient.	
6.1.4	Install automatic shutoffs, solenoids and controllers to turn water off when not in use.	
6.1.5	Install flow restrictors when applicable.	
6.1.6	Where point of use hot water system is used – The performance standard for point of use hot water system is defined as: Using 0.5 gallons of water or less discharged at any fixture before hot water arrives.	
6.2	Cooling Towers	
6.2.1	Equip boilers with makeup meters and conductivity controllers for blowdown control.	
6.2.2	Reuse or return steam condensate to the boiler wherever possible.	
6.2.3	Install makeup meters on all recirculating closed water loops used for heating and cooling systems so that leaks in these recirculating systems can be easily detected.	
6.2.4	No evaporative air conditioning system is encouraged. When evaporative air conditioners are installed, it shall use 5 gallons (or less) of water per ton-hour of cooling when adjusted to maximum water-use. Blow-down shall be based on time of operation, not to exceed three times in one 24-hour operating period. The reservoir discharge outlet should be easily visible so the homeowner can see when the refill valve is leaking.	
6.3	Swimming Pools	
6.3.1	Combined pool and spa surface deducted from turf allowance.	
6.3.2	Pools do not feature decorative water features that drop or propel water more than 24 inches above the main water surface.	
6.4	Commercial Kitchens	
	Full service restaurant, bar and cocktail lounges, fast-food restaurants, take-out restaurant, food preparation outlets (bakeries, meat markets, commissaries) and other residential institutions or facilities with a cafeteria.	
6.4.1	Kitchen faucets shall have aerators or laminar flow control devices with a maximum flow rate of 1.5 gpm or less.	
6.4.2	Food steamers in all food service facilities shall be boiler less or self contained models where applicable.	
6.4.3	Ice machines shall be air-cooled or use no more than 20 gallons of water per 100 pounds of ice and shall be equipped with a recirculating cooling unit. Flake ice machines are more water-efficient and should be used where possible.	
6.4.4	Use waterless (air cooled) wok system where possible. If a water cooled wok system or water curtain system is absolutely necessary, the flow should be limited to less than 0.5 gpm.	
6.4.5	Commercial refrigeration shall be air cooled or if water cooled, must have a closed loop system. No once through, single pass systems should be permitted.	
6.4.6	Any and all water-cooled equipment should be eliminated unless it uses chilled water or cooling tower loop.	

APPENDIX 3 - CHECKLIST

	Additional Recommendations	Recommended
6.4.7	Dishwashing Equipment	
6.4.7.1	Dishwashers should use less than 1.2 gallons per rack for fill and dump machines and less than 0.9 gallons per rack for all other types of machines.	
6.4.7.2	Under the counter machines should not exceed 1.0 gallons per rack for high-temperature machines and 1.7 gallons per rack for low temperature machines.	
6.4.7.3	Pre-rinse dishwashing spray valves shall have a maximum flow rate of 1.6 gpm or less and contain a shut off valve.	
6.5	Medical Facilities and Laboratories	
	These criteria are for the following land use types:	
	Dentist's offices, Physician's offices, Veterinarian's offices and Hospitals	
6.5.1	X-Ray Equipment	
6.5.1.1	Use of digital x-ray shall be considered where available and applicable.	
6.5.1.2	For large frame x-ray equipment, water saving devices shall be integrated to eliminate continuous flowing cooling water loops of the film developers.	
6.5.2	Vacuum Pumps	
6.5.2.1	For medical and dental vacuum pump system, choose dry vacuum systems to eliminate water-use.	
6.5.2.2	Eliminate venturi aspirator vacuum systems by using mechanical dry vacuum equipment.	
6.5.3	Hood Systems	
6.5.3.1	For laboratory exhaust hoods, use dry system wherever possible.	
6.5.3.2	Where exhaust hood scrubber systems are used, adjust the flow rates to minimize water-use.	
6.5.3.3	Include self-closing valves on fume hood wash down systems for special applications such as perchloric acid hoods to limit water-use.	
6.6	Vehicle Washing	
	These criteria are for the following land use types:	
6.6.1	Vehicle wash facilities shall reuse a minimum of 70% of water from previous vehicle rinses in subsequent washes.	
6.6.2	Choose new rollover and conveyor equipment that uses less than 35 gallons per vehicle for automobiles and light trucks and less than 75 gallons per vehicle for bus and large truck washes.	
6.6.3	Select handheld spray equipment. Foamy brush and similar systems that use no more than 3.0 gpm for automobiles washing and no more than 3.5 gpm for bus and large truck washes.	
6.6.4	Include positive shutoff valves on handheld spray wands, foamy brush and similar systems so water will not run when equipment is not in use.	
6.7	Laundry Operations	
	These criteria are for the following land use types:	
6.7.1	Large volume commercial operations should consider using tunnel washers.	
6.7.2	The use of water recovery or ozone systems shall be used to minimize water-use.	
6.7.3	The installation of high recovery water recycling equipment.	
6.7.4	Commercial laundry washing machines shall be front loading horizontal axis or top loading models with (1) a water factor rating of 8 or lower as identified under Energy Star label or (2) display an EPA WaterSense label when available.	

21

APPENDIX 2 - STANDARD CHECKLIST

	Additional Recommendations	Recommended
7.0	OUTDOOR WATER-USE RESIDENTIAL, NON-RESIDENTIAL AND RIGHTS-OF-WAY	
7.1	Landscape Plan and Plant Selection	
	All landscape installation shall be in compliance with the Miami-Dade County Landscape Manual and/or with the Guide to Florida-Friendly Landscaping provided by the Florida Yards and Neighborhoods.	
7.1.1	Site characteristics (soil, drainage, structural) and limitations (utilities, overhangs, light) shall be incorporated in the development of the landscape plan and plant palette.	
7.1.2	Per County's Landscape Ordinance (Chapter 18A of the County Code), existing native trees, palms and associated native understory, shall be retained and preserved.	
7.1.3	Eighty (80) percent of plant material to be utilized on site shall be from the Miami-Dade Landscape Manual, the Miami-Dade Street Tree Master Plan and/or the University of Florida's Low-Maintenance Landscape Plants for South Florida list.	
7.1.4	In order to conserve water, reduce maintenance, and promote plant health, plant species shall be selected and installed based on their water needs, growth rate and size, and resource inputs. Plants with similar water needs shall be grouped in hydrozones. Adequate growth area (including rooting space), based on natural mature shape and size shall be provided for all plant materials.	
7.1.5	The plan shall include the use of native plant species in order to re-establish an aesthetic regional quality and take advantage of the unique diversity and adaptability of native species to the environmental conditions of South Florida. Where feasible, the re-establishment of native habitats shall be incorporated into the landscape plan.	
7.1.6	The maximum lawn area shall be in compliance with the County's Landscape Ordinance (Section 18A-6 of the County Code).	
7.1.7	Soil analysis should be completed and used in plant selection process where applicable and a copy should be provided to the homebuyer.	
7.1.8	Environmentally friendly organic mulches shall be applied and maintained in a minimum three (3) inch layer under and around all trees and shrubs, and in a minimum two (2) inch layer under and around all ground cover.	
7.1.9	As provided in the Landscape Manual, lots with landscapes adjoining water bodies shall provide for a maintenance free or low maintenance zone adjacent to the water body. This area can be enhanced with natural wetland vegetation; in any case, the area should be planted to eliminate erosion potential.	
7.2	Irrigation	
7.2.1	All newly-planted and relocated plant material shall be watered by temporary or permanent irrigation systems until such time as they are established and subsequently on an as needed basis, to prevent stress and die off in compliance with existing water restrictions.	
7.2.2	Irrigation shall be prohibited within native plant communities and natural forest communities, except for temporary systems needed to establish newly planted material. Temporary irrigation systems shall be disconnected immediately after establishment of plant communities.	
7.2.3	Irrigation systems shall be designed, operated and maintained to:	
7.2.3.1	Meet the needs of the plants in the landscape.	
7.2.3.2	Conserve water by allowing differential operation schedules based on hydrozone.	
7.2.3.3	Consider soil, slope and other site characteristics in order to minimize water waste, including overspray or overflow on to impervious surfaces and other non-vegetated areas, and off-site runoff.	
7.2.3.4	Minimize free flow conditions in case of damage or other mechanical failure.	
7.2.3.5	Use low trajectory spray heads, and/or low volume water distributing or application devices.	

APPENDIX 2 - STANDARD CHECKLIST

	Additional Recommendations	Recommended
7.2.3.6	Maximize uniformity, considering factors such as:	
7.2.4.6.1	Emitters types,	
7.2.4.6.2	Head Spacing,	
7.2.4.6.3	Sprinkler pattern, and	
7.2.4.6.4	Water pressure at the emitter.	
7.2.3.7	Use the lowest quality water feasible (gray water shall be used where approved systems are available).	
7.2.3.8	Rain switches or other devices, such as soil moisture sensors, shall be used with automatic controls.	
7.2.3.9	Operate only during hours and on days permitted under Chapter 32 of the Code.	
7.2.3.10	Where feasible, drip irrigation or micro-sprinklers shall be used.	
7.2.4	During dry periods, irrigation application rates of between one (1) and one and one-half (1 ½) inches per week are recommended for turf areas.	
7.2.4.1	Meet the needs of the plants in the landscape.	
7.2.4.2	Conserve water by allowing differential operation schedules based on hydrozone.	
7.2.4.3	Consider soil, slope and other site characteristics in order to minimize water waste, including overspray or overflow on to impervious surfaces and other non-vegetated areas, and off-site runoff.	
7.2.4.4	Minimize free flow conditions in case of damage or other mechanical failure.	
7.2.4.5	Use low trajectory spray heads, and/or low volume water distributing or application devices.	
7.2.4.6	Maximize uniformity, considering factors such as:	
7.2.4.6.1	Emitters types,	
7.2.4.6.2	Head Spacing,	
7.2.4.6.3	Sprinkler pattern, and	
7.2.4.6.4	Water pressure at the emitter.	
7.2.4.7	Use the lowest quality water feasible (gray water shall be used where approved systems are available).	
7.2.4.8	Rain switches or other devices, such as soil moisture sensors, shall be used with automatic controls.	
7.2.4.9	Operate only during hours and on days permitted under Chapter 32 of the Code.	
7.2.4.10	Where feasible, drip irrigation or micro-sprinklers shall be used.	
7.2.5	If an irrigation system is not provided, a hose bib shall be provided within seventy-five (75) feet of any landscape area.	
7.3	Surface Elements and Features	
7.3.1	Gutter downspouts, roof runoff, and rain harvesting shall be used to encourage increase recharge and other non-portable uses on the property, thru the use of elements and features such as rain barrels and direct runoff to landscaped areas.	
7.3.2	Use of porous surfaces (brick, gravel, turf block, mulch, and pervious concrete) shall be used whenever applicable on walkways, driveways and patios.	
7.3.3	Miami-Dade Landscape Manual and Florida Yards and Neighborhoods' Program Information on Florida Friendly Landscapes shall be included in the sales literature provided to homebuyers.	

Carlos Alvarez
Mayor
Board of County Commissioners
Bruno A. Barreiro, Chairman
Barbara J. Jordan, Vice Chairwoman

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Director, Water and Sewer Department

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in employment and services and does not discriminate on the basis of disability.
"It is the policy of Miami-Dade County to comply with all of the
requirements of the Americans with Disabilities Act."

The content of this document is the result of the recommendations made by the "Advisory Committee to Address Water Conservation Issues and Alternative Water Supplies for the Development Community" a stakeholder group that included; business, home builders, environmentalist, trade organizations, manufacturers, landscape irrigation industry, nurseries, farmers, state agencies, county departments and the participation of the general public through a series of public meetings.

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24

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